The MASTER of ACTION and SUSPENSE

Alistair MacLean

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Ice Station Zebra

Alistair MacLean
Ice Station Zebra

Аннотация

A classic thriller from the bestselling master of action and suspense.The atomic submarine Dolphin has impossible orders: to sail beneath the ice-floes of the Arctic Ocean to locate and rescue the men of weather-station Zebra, gutted by fire and drifting with the ice-pack somewhere north of the Arctic Circle.But the orders do not say what the Dolphin will find if she succeeds – that the fire at Ice Station Zebra was sabotage, and that one of the survivors is a killer…

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ALISTAIR MACLEAN

Ice Station Zebra

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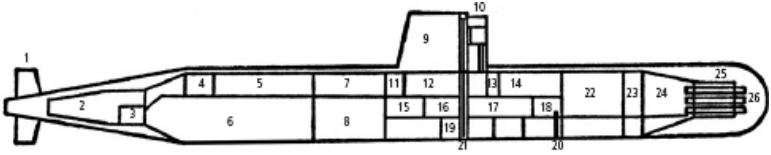
Dedication

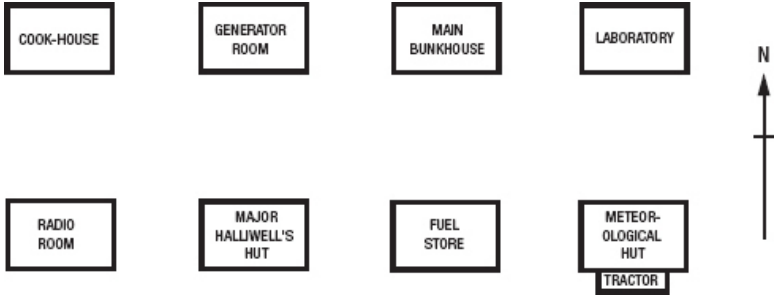
To Lachlan, Michael and Alistair
U.S.S. *Dolphin*



1. Rudder
2. Stern Room
3. Nucleonics Room
4. Manœuvring Room
5. Engine Room
6. Machinery space
7. Passage over reactor
8. Reactor Room
9. Sail
10. Bridge
11. Radio Room (port)
12. Control Room
13. Captain's Cabin (port; Sickbay (starboard)
14. Wardroom
15. Inertial Navigation Room

16. Electronics Room
17. Crew's Quarters
18. Galley
19. Medical Store
20. Disposal Chute
21. Periscope (retracted)
22. Torpedo Storage Room
23. Collision Space
24. Torpedo Room
25. Torpedo Tubes
26. Bow caps

ICE STATION ZEBRA



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ONE

Commander James D. Swanson of the United States Navy was short, plump and crowding forty. He had jet black hair topping a pink cherubic face, and with the deep permanent creases of laughter lines radiating from his eyes and curving round his mouth he was a dead ringer for the cheerful, happy-go-lucky extrovert who is the life and soul of the party where the guests park their brains along with their hats and coats. That, anyway, was how he struck me at first glance but on the reasonable assumption that I might very likely find some other qualities in the man picked to command the latest and most powerful nuclear submarine afloat I took a second and closer look at him and this time I saw what I should have seen the first time if the dank grey fog and winter dusk settling down over the Firth of Clyde hadn't made seeing so difficult. His eyes. Whatever his eyes were they weren't those of the gladhanding, wisecracking *bon vivant*. They were the coolest, clearest grey eyes I'd ever seen, eyes that he used as a dentist might his probe, a surgeon his lancet or a scientist his electronic microscope. Measuring eyes. They measured first me and then the paper he held in his hand but gave no clue at all as to the conclusions arrived at on the basis of measurements made.

'I'm sorry, Dr Carpenter.' The south-of-the-Mason-Dixon-line voice was quiet and courteous, but without any genuine regret that I could detect, as he folded the telegram back into its

envelope and handed it to me. 'I can accept neither this telegram as sufficient authorisation nor yourself as a passenger. Nothing personal, you know that; but I have my orders.'

'Not sufficient authorisation?' I pulled the telegram from its cover and pointed to the signature. 'Who do you think this is – the resident window-cleaner at the Admiralty?'

It wasn't funny, and as I looked at him in the failing light I thought maybe I'd overestimated the depth of the laughter lines in the face. He said precisely: 'Admiral Hewson *is* commander of the Nato Eastern Division. On Nato exercises I come under his command. At all other times I am responsible only to Washington. This is one of those other times. I'm sorry. And I must point out, Dr Carpenter, that you could have arranged for anyone in London to send this telegram. It's not even on a naval message form.'

He didn't miss much, that was a fact, but he was being suspicious about nothing. I said: 'You could call him up by radio-telephone, Commander.'

'So I could,' he agreed. 'And it would make no difference. Only accredited American nationals are allowed aboard this vessel – and the authority must come from Washington.'

'From the Director of Underseas Warfare or Commander Atlantic submarines?' He nodded, slowly, speculatively, and I went on: 'Please radio them and ask them to contact Admiral Hewson. Time is very short, Commander.' I might have added that it was beginning to snow and that I was getting colder by the

minute, but I refrained.

He thought for a moment, nodded, turned and walked a few feet to a portable dockside telephone that was connected by a looping wire to the long dark shape lying at our feet. He spoke briefly, keeping his voice low, and hung up. He barely had time to rejoin me when three duffel-coated figures came hurrying up an adjacent gangway, turned in our direction and stopped when they reached us. The tallest of the three tall men, a lean rangy character with wheat-coloured hair and the definite look of a man who ought to have had a horse between his legs, stood slightly in advance of the other two. Commander Swanson gestured towards him.

'Lieutenant Hansen, my executive officer. He'll look after you till I get back.' The commander certainly knew how to choose his words.

'I don't need looking after,' I said mildly. 'I'm all grown up now and I hardly ever feel lonely.'

'I shall be as quick as I can, Dr Carpenter,' Swanson said. He hurried off down the gangway and I gazed thoughtfully after him. I put out of my mind any idea I might have had about the Commander U.S. Atlantic Submarines picking his captains from the benches in Central Park. I had tried to effect an entrance aboard Swanson's ship and if such an entrance was unauthorised he didn't want me taking off till he'd found out why. Hansen and his two men, I guessed, would be the three biggest sailors on the ship.

The ship. I stared down at the great black shape lying almost at my feet. This was my first sight of a nuclear-engined submarine, and the *Dolphin* was like no submarine that I had ever seen. She was about the same length as a World War II long-range ocean-going submarine but there all resemblance ceased. Her diameter was at least twice that of any conventional submarine. Instead of having the vaguely boat-shaped lines of her predecessors, the *Dolphin* was almost perfectly cylindrical in design: instead of the usual V-shaped bows, her fore end was completely hemispherical. There was no deck, as such: the rounded sheer of sides and bows rose smoothly to the top of the hull then fell as smoothly away again, leaving only a very narrow fore-and-aft working space so dangerously treacherous in its slippery convexity that it was permanently railed off in harbour. About a hundred feet back from the bows the slender yet massive conning-tower reared over twenty feet above the deck, for all the world like the great dorsal fin of some monstrous shark: halfway up the sides of the conning-tower and thrust out stubbily at right angles were the swept-back auxiliary diving planes of the submarine. I tried to see what lay farther aft but the fog and the thickening snow swirling down from the north of Loch Long defeated me. Anyway, I was losing interest. I'd only a thin raincoat over my clothes and I could feel my skin start to gooseflesh under the chill fingers of that winter wind.

'Nobody said anything about us having to freeze to death,' I said to Hansen. 'That naval canteen there. Would your principles

prevent you from accepting a cup of coffee from Dr Carpenter, that well-known espionage agent?'

He grinned and said: 'In the matter of coffee, friend, I have no principles. Especially to-night. Someone should have warned us about these Scottish winters.' He not only looked like a cowboy, he talked like one: I was an expert on cowboys as I was sometimes too tired to rise to switch off the TV set. 'Rawlings, go tell the captain that we are sheltering from the elements.'

While Rawlings went to the dockside phone Hansen led the way to the nearby neon-lit canteen. He let me precede him through the door then made for the counter while the other sailor, a red-complexioned character about the size and shape of a polar bear, nudged me gently into an angled bench seat in one corner of the room. They weren't taking too many chances with me. Hansen came and sat on the other side of me, and when Rawlings returned he sat squarely in front of me across the table.

'As neat a job of corralling as I've seen for a long time,' I said approvingly. 'You've got nasty suspicious minds, haven't you?'

'You wrong us,' Hansen said sadly. 'We're just three friendly sociable guys carrying out our orders. It's Commander Swanson who has the nasty suspicious mind, isn't that so, Rawlings?'

'Yes, indeed, Lieutenant,' Rawlings said gravely. 'Very security-minded, the captain is.'

I tried again. 'Isn't this very inconvenient for you?' I asked. 'I mean, I should have thought that every man would have been urgently required aboard if you're due to sail in less than two

hours' time.'

'You just keep on talking, Doc,' Hansen said encouragingly. There was nothing encouraging about his cold blue Arctic eyes, 'I'm a right good listener.'

'Looking forward to your trip up to the ice-pack?' I inquired pleasantly.

They operated on the same wavelength, all right. They didn't even look at one another. In perfect unison they all hitched themselves a couple of inches closer to me, and there was nothing imperceptible about the way they did it either. Hansen waited, smiling in a pleasantly relaxed fashion until the waitress had deposited four steaming mugs of coffee on the table, then said in the same encouraging tone: 'Come again, friend. Nothing we like to hear better than top classified information being bandied about in canteens. How the hell do *you* know where we're going?'

I reached up my hand beneath my coat lapel and it stayed there, my right wrist locked in Hansen's right hand.

'We're not suspicious or anything,' he said apologetically. 'It's just that we submariners are very nervous on account of the dangerous life we lead. Also, we've a very fine library of films aboard the *Dolphin* and every time a character in one of those films reaches up under his coat it's always for the same reason and that's not just because he's checking to see if his wallet's still there.'

I took his wrist with my free hand, pulled his arm away and pushed it down on the table. I'm not saying it was easy, the U.S.

Navy clearly fed its submariners on a high protein diet, but I managed it without bursting a blood-vessel. I pulled a folded newspaper out from under my coat and laid it down. 'You wanted to know how the hell I knew where you were going,' I said. 'I can read, that's why. That's a Glasgow evening paper I picked up in Renfrew Airport half an hour ago.'

Hansen rubbed his wrist thoughtfully, then grinned. 'What did you get your doctorate in, Doc? Weight-lifting? About that paper – how could you have got it in Renfrew half an hour ago?'

'I flew down here. Helicopter.'

'A whirlybird, eh? I heard one arriving a few minutes ago. But that was one of ours.'

'It had U.S. Navy written all over it in four-foot letters,' I conceded, 'and the pilot spent all his time chewing gum and praying out loud for a quick return to California.'

'Did you tell the skipper this?' Hansen demanded.

'He didn't give me the chance to tell him anything.'

'He's got a lot on his mind and far too much to see to,' Hansen said. He unfolded the paper and looked at the front page. He didn't have far to look to find what he wanted: the two-inch banner headlines were spread over seven columns.

'Well, would you look at this.' Lieutenant Hansen made no attempt to conceal his irritation and chagrin. 'Here we are, pussy-footing around in this God-forsaken dump, sticking-plaster all over our mouths, sworn to eternal secrecy about mission and destination and then what? I pick up this blasted Limey

newspaper and here are all the top-secret details plastered right across the front page.'

'You are kidding, Lieutenant,' said the man with the red face and the general aspect of a polar bear. His voice seemed to come from his boots.

'I am not kidding, Zabrinski,' Hansen said coldly, 'as you would appreciate if you had ever learned to read. "Nuclear submarine to the rescue," it says. "Dramatic dash to the North Pole." God help us, the North Pole. And a picture of the *Dolphin*. And of the skipper. Good lord, there's even a picture of me.'

Rawlings reached out a hairy paw and twisted the paper to have a better look at the blurred and smudged representation of the man before him. 'So there is. Not very flattering, is it, Lieutenant? But a speaking likeness, mind you, a speaking likeness. The photographer has caught the essentials perfectly.'

'You are utterly ignorant of the first principles of photography,' Hansen said witheringly. 'Listen to this lot. "The following joint statement was issued simultaneously a few minutes before noon (G.M.T.) to-day in both London and Washington: 'In view of the critical condition of the survivors of Drift Ice Station Zebra and the failure either to rescue or contact them by conventional means, the United States Navy has willingly agreed that the United States nuclear submarine *Dolphin* be dispatched with all speed to try to effect contact with the survivors.

'"The *Dolphin* returned to its base in the Holy Loch, Scotland,

at dawn this morning after carrying out extensive exercises with the Nato naval forces in the Eastern Atlantic. It is hoped that the *Dolphin* (Commander James D. Swanson, U.S.N., commanding) will sail at approximately 7 p.m. (G.M.T.) this evening.

'"The laconic understatement of this communique heralds the beginning of a desperate and dangerous rescue attempt which must be without parallel in the history of the sea or the Arctic. It is now sixty hours –"'

'"Desperate," you said, Lieutenant?' Rawlings frowned heavily. '"Dangerous," you said? The captain will be asking for volunteers?'

'No need. I told the captain that I'd already checked with all eighty-eight enlisted men and that they'd volunteered to a man.'

'You never checked with me.'

'I must have missed you out. Now kindly clam up, your executive officer is talking. "It is now sixty hours since the world was electrified to learn of the disaster which had struck Drift Ice Station Zebra, the only British meteorological station in the Arctic, when an English-speaking ham radio operator in Bodo, Norway picked up the faint S O S from the top of the world.

'"A further message, picked up less than twenty-four hours ago by the British trawler *Morning Star* in the Barents Sea makes it clear that the position of the survivors of the fuel oil fire that destroyed most of Drift Ice Station Zebra in the early hours of Tuesday morning is desperate in the extreme. With their fuel oil reserves completely destroyed and their food stores all but wiped

out, it is feared that those still living cannot long be expected to survive in the twenty-below temperatures – fifty degrees of frost – at present being experienced in that area.

"'It is not known whether all the prefabricated huts, in which the expedition members lived, have been destroyed.

"'Drift Ice Station Zebra, which was established only in the late summer of this year, is at present in an estimated position of 85° 40′ N. 21° 30′ E., which is only about three hundred miles from the North Pole. Its position cannot be known with certainty because of the clockwise drift of the polar ice-pack.

"'For the past thirty hours long-range supersonic bombers of the American, British and Russian air forces have been scouring the polar ice-pack searching for Station Zebra. Because of the uncertainty about the Drift Station's actual position, the complete absence of daylight in the Arctic at this time of year and the extremely bad weather conditions they were unable to locate the station and forced to return.'"

'They didn't have to locate it,' Rawlings objected. 'Not visually. With the instruments those bombers have nowadays they could home in on a humming-bird a hundred miles away. The radio operator at the Drift Station had only to keep on sending and they could have used that as a beacon.'

'Maybe the radio operator is dead,' Hansen said heavily. 'Maybe his radio has packed up on him. Maybe the fuel that was destroyed was essential for running the radio. All depends what source of power he used.'

'Diesel-electric generator,' I said. 'He had a standby battery of Nife cells. Maybe he's conserving the batteries using them only for emergencies. There's also a hand-cranked generator, but its range is pretty limited.'

'How do you know that?' Hansen asked quietly. 'About the type of power used?'

'I must have read it somewhere.'

'You must have read it somewhere.' He looked at me without expression, then turned back to his paper. '"A report from Moscow,"' he read on, '"states that the atomic-engined *Dvina*, the world's most powerful ice-breaker, sailed from Murmansk some twenty hours ago and is proceeding at high speed towards the Arctic pack. Experts are not hopeful about the outcome for at this late period of the year the ice-pack has already thickened and compacted into a solid mass which will almost certainly defy the efforts of any vessel, even those of the *Dvina*, to smash its way through.

'"The use of the submarine *Dolphin* appears to offer the only slender hope of life for the apparently doomed survivors of Station Zebra. The odds against success must be regarded as heavy in the extreme. Not only will the *Dolphin* have to travel several hundred miles continuously submerged under the polar ice-cap, but the possibilities of its being able to break through the ice-cap at any given place or to locate the survivors are very remote. But undoubtedly if any ship in the world can do it it is the *Dolphin*, the pride of the United States Navy's nuclear submarine

fleet.'"

Hansen broke off and read on silently for a minute. Then he said: 'That's about all. A story giving all the known details of the *Dolphin*. That, and a lot of ridiculous rubbish about the enlisted men in the *Dolphin*'s crew being the *élite* of the cream of the U.S. Navy.'

Rawlings looked wounded. Zabrinski, the polar bear with the red face, grinned, fished out a pack of cigarettes and passed them around. Then he became serious again and said: 'What are those crazy guys doing up there at the top of the world anyway?'

'Meteorological, lunkhead,' Rawlings informed him. 'Didn't you hear the lieutenant say so? A big word, mind you,' he conceded generously, 'but he made a pretty fair stab at it. Weather station to you, Zabrinski.'

'I still say they're crazy guys,' Zabrinski rumbled. 'Why do they do it, Lieutenant?'

'I suggest you ask Dr Carpenter about it,' Hansen said dryly. He stared through the plate-glass windows at the snow whirling greyly through the gathering darkness, his eyes bleak and remote, as if he were already visualising the doomed men drifting to their death in the frozen immensity of the polar ice-cap. 'I think he knows a great deal more about it than I do.'

'I know a little,' I admitted. 'There's nothing mysterious or sinister about what I know. Meteorologists now regard the Arctic and the Antarctic as the two great weather factories of the world, the areas primarily responsible for the weather that affects the

rest of the hemisphere. We already know a fair amount about Antarctic conditions, but practically nothing about the Arctic. So we pick a suitable ice-floe, fill it with huts crammed with technicians and all sorts of instruments and let them drift around the top of the world for six months or so. Your own people have already set up two or three of those stations. The Russians have set up at least ten, to the best of my knowledge, most of them in the East Siberian Sea.'

'How do they establish those camps, Doc?' Rawlings asked.

'Different ways. Your people prefer to establish them in winter-time, when the pack freezes up enough for plane landings to be made. Someone flies out from, usually, Point Barrow in Alaska and searches around the polar pack till they find a suitable ice-floe – even when the ice is compacted and frozen together into one solid mass an expert can tell which pieces are going to remain as good-sized floes when the thaw comes and the break-in begins. Then they fly out all huts, equipment, stores and men by ski-plane and gradually build the place up.

'The Russians prefer to use a ship in summer-time. They generally use the *Lenin*, a nuclear-engined ice-breaker. It just batters its way into the summer pack, dumps everything and everybody on the ice and takes off before the big freeze-up starts. We used the same technique for Drift Ice Station Zebra – our one and only ice station. The Russians lent us the *Lenin* – all countries are only too willing to co-operate on meteorological research as everyone benefits by it – and took us pretty deep into the ice-pack

north of Franz Josef Land. Zebra has already moved a good bit from its original position – the polar ice-cap, just sitting on top of the Arctic Ocean, can't quite manage to keep up with the west-east spin of the earth so that it has a slow westward movement in relation to the earth's crust. At the present moment it's about four hundred miles due north of Spitzbergen.'

'They're still crazy,' Zabrinski said. He was silent for a moment then looked speculatively at me. 'You in the Limey navy, Doc?'

'You must forgive Zabrinski's manners, Dr Carpenter,' Rawlings said coldly. 'But he's denied the advantages that the rest of us take for granted. I understand he was born in the Bronx.'

'No offence,' Zabrinski said equably. 'Royal Navy, I meant. Are you, Doc?'

'Attached to it, you might say.'

'Loosely, no doubt,' Rawlings nodded. 'Why so keen on an Arctic holiday, Doc? Mighty cool up there, I can tell you.'

'Because the men on Drift Station Zebra are going to be badly in need of medical aid. If there are any survivors, that is.'

'We got our own medico on board and he's no slouch with a stethoscope, or so I've heard from several who have survived his treatment. A well-spoken-of quack.'

'Doctor, you ill-mannered lout,' Zabrinski said severely.

'That's what I meant,' Rawlings apologised. 'It's not often that I get the chance to talk to an educated man like myself, and it just kinda slipped out. The point is, the *Dolphin*'s already all buttoned

up on the medical side.'

'I'm sure it is.' I smiled. 'But any survivors we might find are going to be suffering from advanced exposure, frostbite and probably gangrene. The treatment of those is rather a speciality of mine.'

'Is it now?' Rawlings surveyed the depths of his coffee cup. 'I wonder how a man gets to be a specialist in those things?'

Hansen stirred and withdrew his gaze from the darkly-white world beyond the canteen windows.

'Dr Carpenter is not on trial for his life,' he said mildly. 'The counsel for the prosecution will kindly pack it in.'

They packed it in. This air of easy familiarity between officer and men, the easy camaraderie, the mutually tolerant disparagement with the deceptively misleading overtones of knock-about comedy, was something very rare in my experience but not unique. I'd seen it before, in first-line R.A.F. bomber crews, a relationship found only among a close-knit, close-living group of superbly trained experts each of whom is keenly aware of their complete interdependence. The casually informal and familiar attitude was a token not of the lack of discipline but of the complete reverse: it was the token of a very high degree of self-discipline, of the regard one man held for another not only as a highly-skilled technician in his own field but also as a human being. It was clear, too, that a list of unwritten rules governed their conduct. Off-hand and frequently completely lacking in outward respect though Rawlings and Zabrinski were in their

attitude towards Lieutenant Hansen, there was an invisible line of propriety over which it was inconceivable that they would ever step: for Hansen's part, he scrupulously avoided any use of his authority when making disparaging remarks at the expense of the two enlisted men. It was also clear, as now, who was boss.

Rawlings and Zabrinski stopped questioning me and had just embarked upon an enthusiastic discussion of the demerits of the Holy Loch in particular and Scotland in general as a submarine base when a jeep swept past the canteen windows, the snow whirling whitely, thickly, through the swathe of the headlights. Rawlings jumped to his feet in mid-sentence, then subsided slowly and thoughtfully into his chair.

'The plot,' he announced, 'thickens.'

'You saw who it was?' Hansen asked.

'I did indeed. Andy Bandy, no less.'

'I didn't hear that, Rawlings,' Hansen said coldly.

'Vice-Admiral John Garvie, United States Navy, sir.'

'Andy Bandy, eh?' Hansen said pensively. He grinned at me. 'Admiral Garvie, Officer Commanding U.S. Naval Forces in Nato. Now this is very interesting, I submit. I wonder what he's doing here.'

'World War III has just broken out,' Rawlings announced. 'It's just about time for the Admiral's first martini of the day and no lesser crisis –'

'He didn't by any chance fly down with you in that chopper from Renfrew this afternoon?' Hansen interrupted shrewdly.

'No.'

'Know him, by any chance?'

'Never even heard of him until now.'

'Curiouser and curiouser,' Hansen murmured.

A few minutes passed in desultory talk – the minds of Hansen and his two men were obviously very much on the reason for the arrival of Admiral Garvie – and then a snow-filled gust of chilled air swept into the canteen as the door opened and a blue-coated sailor came in and crossed to our table.

'The captain's compliments, Lieutenant. Would you bring Dr Carpenter to his cabin, please?'

Hansen nodded, rose to his feet and led the way outside. The snow was beginning to lie now, the darkness was coming down fast and the wind from the north was bitingly chill. Hansen made for the nearest gangway, halted at its head as he saw seamen and dockyard workers, insubstantial and spectral figures in the swirling flood-lit snow, carefully easing a slung torpedo down the for'ard hatch, turned and headed towards the after gangway. We clambered down and at the foot Hansen said: 'Watch your step, Doc. It's a mite slippery hereabouts.'

It was all that, but with the thought of the ice-cold waters of the Holy Loch waiting for me if I put a foot wrong I made no mistake. We passed through the hooped canvas shelter covering the after hatch and dropped down a steep metal ladder into a warm, scrupulously clean and gleaming engine-room packed with a baffling complexity of grey-painted machinery

and instrument panels, its every corner brightly illuminated with shadowless fluorescent lighting.

'Not going to blindfold me, Lieutenant?' I asked.

'No need.' He grinned. 'If you're on the up and up, it's not necessary. If you're not on the up and up it's still not necessary, for you can't talk about what you've seen – not to anyone that matters – if you're going to spend the next few years staring out from behind a set of prison bars.'

I saw his point. I followed him for'ard, our feet soundless on the black rubber decking past the tops of a couple of huge machines readily identifiable as turbo-generator sets for producing electricity. More heavy banks of instruments, a door, then a thirty-foot-long very narrow passageway. As we passed along its length I was conscious of a heavy vibrating hum from beneath my feet. The *Dolphin*'s nuclear reactor had to be somewhere. This would be it, here. Directly beneath us. There were circular hatches on the passageway deck and those could only be covers for the heavily-leaded glass windows, inspection ports which would provide the nearest and only approach to the nuclear furnace far below.

The end of the passage, another heavily-clipped door, and then we were into what was obviously the control centre of the *Dolphin*. To the left was a partitioned-off radio room, to the right a battery of machines and dialled panels of incomprehensible purpose, straight ahead a big chart table. Beyond that again, in the centre were massive mast housings and, still farther on,

the periscope stand with its twin periscopes. The whole control room was twice the size of any I'd ever seen in a conventional submarine but, even so, every square inch of bulkhead space seemed to be taken up by one type or another of highly-complicated looking machines or instrument banks: even the deckhead was almost invisible, lost to sight above thickly twisted festoons of wires, cables and pipes of a score of different kinds.

The for'ard port side of the control room was for all the world like a replica of the flight-deck of a modern multi-engined jet airliner. There were two separate yoke aircraft-type control columns, facing on to banks of hooded calibrated dials. Behind the yokes were two padded leather chairs, each chair, I could see, fitted with safety-belts to hold the helmsman in place. I wondered vaguely what type of violent manoeuvres the *Dolphin* might be capable of when such safety-belts were obviously considered essential to strap the helmsman down.

Opposite the control platform, on the other side of the passageway leading forward from the control room, was a second partitioned-off room. There was no indication what this might be and I wasn't given time to wonder. Hansen hurried down the passage, stopped at the first door on his left, and knocked. The door opened and Commander Swanson appeared.

'Ah, there you are. Sorry you've been kept waiting, Dr Carpenter. We're sailing at six-thirty, John' – this to Hansen. 'You can have everything buttoned up by then?'

'Depends how quickly the loading of the torpedoes goes,

Captain.'

'We're taking only six aboard.'

Hansen lifted an eyebrow, made no comment. He said: 'Loading them into the tubes?'

'In the racks. They have to be worked on.'

'No spares?'

'No spares.'

Hansen nodded and left. Swanson led me into his cabin and closed the door behind him.

Commander Swanson's cabin was bigger than a telephone booth, I'll say that for it, but not all that much bigger to shout about. A built-in bunk, a folding washbasin, a small writing-bureau and chair, a folding camp-stool, a locker, some calibrated repeater instrument dials above the bunk and that was it. If you'd tried to perform the twist in there you'd have fractured yourself in a dozen places without ever moving your feet from the centre of the floor.

'Dr Carpenter,' Swanson said, 'I'd like you to meet Admiral Garvie, Commander U.S. Nato Naval Forces.'

Admiral Garvie put down the glass he was holding in his hand, rose from the only chair and stretched out his hand. As he stood with his feet together, the far from negligible clearance between his knees made it easy to understand the latter part of his 'Andy Bandy' nickname: like Hansen, he'd have been at home on the range. He was a tall florid-faced man with white hair, white eyebrows and a twinkle in the blue eyes below: he had that

certain indefinable something about him common to all senior naval officers the world over, irrespective of race or nationality.

'Glad to meet you, Dr Carpenter. Sorry for the – um – lukewarm reception you received, but Commander Swanson was perfectly within his rights in acting as he did. His men have looked after you?'

'They permitted me to buy them a cup of coffee in the canteen.'

He smiled. 'Opportunists all, those nuclear men. I feel that the good name of American hospitality is in danger. Whisky, Dr Carpenter?'

'I thought American naval ships were dry, sir.'

'So they are, my boy, so they are. Except for a little medicinal alcohol, of course. My personal supply.' He produced a hip-flask about the size of a canteen, reached for a convenient tooth-glass. 'Before venturing into the remoter fastnesses of the Highlands of Scotland the prudent man takes the necessary precautions. I have to make an apology to you, Dr Carpenter. I saw your Admiral Hewson in London last night and had intended to be here this morning to persuade Commander Swanson here to take you aboard. But I was delayed.'

'Persuade, sir?'

'Persuade.' He sighed. 'Our nuclear submarine captains, Dr Carpenter, are a touchy and difficult bunch. From the proprietary attitude they adopt towards their submarines you'd think that each one of them was a majority shareholder in the Electric Boat

Company of Groton, where most of those boats are built.' He raised his glass. 'Success to the commander and yourself. I hope you manage to find those poor devils. But I don't give you one chance in a thousand.'

'I think we'll find them, sir. Or Commander Swanson will.'

'What makes you so sure?' He added slowly, 'Hunch?'

'You could call it that.'

He laid down his glass and his eyes were no longer twinkling. 'Admiral Hewson was most evasive about you, I must say. Who are you, Carpenter? *What* are you?'

'Surely he told you, Admiral? Just a doctor attached to the navy to carry out –'

'A naval doctor?'

'Well, not exactly. I –'

'A civilian, is it?'

I nodded, and the admiral and Swanson exchanged looks which they were at no pains at all to conceal from me. If they were happy at the prospect of having aboard America's latest and most secret submarine a man who was not only a foreigner but a civilian to boot, they were hiding it well. Admiral Garvie said: 'Well, go on.'

'That's all. I carry out environmental health studies for the services. How men react to extremes of environmental conditions, such as in the Arctic or the tropics, how they react to conditions of weightlessness in simulated space flights or to extremes of pressure when having to escape from submarines.

Mainly –'

'Submarines.' Admiral Garvie pounced on the word. 'You have been to sea in submarines, Dr Carpenter. Really sailed in them, I mean?'

'I had to. We found that simulated tank escapes were no substitute for the real thing.'

The admiral and Swanson looked unhappier than ever. A foreigner – bad. A foreign civilian – worse. But a foreign civilian with at least a working knowledge of submarines – terrible. I didn't have to be beaten over the head to see their point of view. I would have felt just as unhappy in their shoes.

'What's your interest in Drift Ice Station Zebra, Dr Carpenter?' Admiral Garvie asked bluntly.

'The Admiralty asked me to go there, sir.'

'So I gather, so I gather,' Garvie said wearily. 'Admiral Hewson made that quite plain to me already. Why *you*, Carpenter?'

'I have some knowledge of the Arctic, sir. I'm supposed to be an expert on the medical treatment of men subjected to prolonged exposure, frostbite and gangrene. I might be able to save lives or limbs that your own doctor aboard might not.'

'I could have half a dozen such experts here in a few hours,' Garvie said evenly. 'Regular serving officers of the United States Navy, at that. That's not enough, Carpenter.'

This was becoming difficult. I tried again. I said: 'I know Drift Station Zebra. I helped select the site. I helped establish the

camp. The commandant, a Major Halliwell, has been my closest friend for many years.' The last was only half the truth but I felt that this was neither the time nor the place for over-elaboration.

'Well, well,' Garvie said thoughtfully. 'And you still claim you're just an ordinary doctor?'

'My duties are flexible, sir.'

'I'll say they are. Well, then, Carpenter, if you're just a common-or-garden sawbones, how do you explain this?' He picked a signal form from the table and handed it to me. 'This has just arrived in reply to Commander Swanson's radioed query to Washington about you.'

I looked at the signal. It read: 'Dr Neil Carpenter's bonafides beyond question. He may be taken into your fullest, repeat fullest confidence. He is to be extended every facility and all aid short of actually endangering the safety of your submarine and the lives of your crew.' It was signed by the Director of Naval Operations.

'Very civil of the Director of Naval Operations, I must say.' I handed back the signal. 'With a character reference like this, what are you worrying about? That ought to satisfy anyone.'

'It doesn't satisfy me,' Garvie said heavily. 'The ultimate responsibility for the safety of the *Dolphin* is mine. This signal more or less gives you *carte blanche* to behave as you like, to ask Commander Swanson to act in ways that might be contrary to his better judgment. I can't have that.'

'Does it matter what you can or can't have? You have your orders. Why don't you obey them?'

He didn't hit me. He didn't even bat an eyelid. He wasn't activated by pique about the fact that he wasn't privy to the reason for the seeming mystery of my presence there, he was genuinely concerned about the safety of the submarine. He said: 'If I think it more important that the *Dolphin* should remain on an active war footing rather than to go haring off on a wild-goose chase to the Arctic, or if I think you constitute a danger to the submarine, I can countermand the D.N.O.'s orders. I'm the C.-in-C. on the spot. And I'm not satisfied.'

This was damnably awkward. He meant every word he said and he didn't look the type who would give a hoot for the consequences if he believed himself to be in the right. I looked at both men, looked at them slowly and speculatively, the unmistakable gaze, I hoped, of a man who was weighing others in the balance: what I was really doing was thinking up a suitable story that would satisfy both. After I had given enough time to my weighing-up – and my thinking – I dropped my voice a few decibels and said: 'Is that door soundproof?'

'More or less,' Swanson said. He'd lowered his own voice to match mine.

'I won't insult either of you by swearing you to secrecy or any such rubbish,' I said quietly. 'I want to put on record the fact that what I am about to tell you I am telling you under duress, under Admiral Garvie's threat to refuse me transport if I don't comply with his wishes.'

'There will be no repercussions,' Garvie said.

'How do you know? Not that it matters now. Well, gentlemen, the facts are these. Drift Ice Station Zebra is officially classed as an Air Ministry meteorological station. Well, it belongs to the Air Ministry all right, but there's not more than a couple of qualified meteorologists among its entire personnel.'

Admiral Garvie refilled the tooth-glass and passed it to me without a word, without a flicker of change in his expression. The old boy certainly knew how to play it cool.

'What you will find there,' I went on, 'are some of the most highly skilled men in the world in the fields of radar, radio, infra-red and electronic computers, operating the most advanced instruments ever used in those fields. We know now, never mind how, the count-down succession of signals the Russians use in the last minute before launching a missile. There's a huge dish aerial in Zebra that can pick up and amplify any such signals within seconds of it beginning. Then long-range radar and infra-red home in on that bearing and within three minutes of the rocket's lift-off they have its height, speed and course pin-pointed to an infinitesimal degree of error. The computers do this, of course. One minute later the information is in the hands of all the anti-missile stations between Alaska and Greenland. One minute more and solid fuel infra-red homing anti-missile rockets are on their way; then the enemy missiles will be intercepted and harmlessly destroyed while still high over the Arctic regions. If you look at a map you will see that in its present position Drift Ice Station Zebra is sitting practically on Russia's missile doorstep.

It's hundreds of miles in advance of the present DEW line – the distant early warning system. Anyway, it renders the DEW line obsolete.'

'I'm only the office boy around those parts,' Garvie said quietly. 'I've never heard of any of this before.'

I wasn't surprised. I'd never heard any of it myself either, not until I'd just thought it up a moment ago. Commander Swanson's reactions, if and when we ever got to Drift Station Zebra, were going to be very interesting. But I'd cross that bridge when I came to it. At present, my only concern was to get there.

'Outside the Drift Station itself,' I said, 'I doubt if a dozen people in the world know what goes on there. But now you know. And you can appreciate how vitally important it is to the free world that this base be maintained in being. If anything has happened to it we want to find out just as quick as possible *what* has happened so that we can get it operating again.'

'I still maintain that you're not an ordinary doctor,' Garvie smiled. 'Commander Swanson, how soon can you get under way?'

'Finish loading the torpedoes, move alongside the *Hunley*, load some final food stores, pick up extra Arctic clothing and that's it, sir.'

'Just like that? You said you wanted to make a slow-time dive out in the loch to check the planes and adjust the underwater trim – those missing torpedoes up front are going to make a difference you know.'

'That's before I heard Dr Carpenter. Now I want to get up there just as fast as he does, sir. I'll see if immediate trim checks are necessary: if not, we can carry them out at sea.'

'It's your boat,' Garvie acknowledged. 'Where are you going to accommodate Dr Carpenter, by the way?'

'There's space for a cot in the Exec's and Engineer's cabin.' He smiled at me. 'I've already had your suitcase put in there.'

'Did you have much trouble with the lock?' I inquired.

He had the grace to colour slightly. 'It's the first time I've ever seen a combination lock on a suitcase,' he admitted. 'It was that, more than anything else – and the fact that we couldn't open it – that made the admiral and myself so suspicious. I've still one or two things to discuss with the admiral, so I'll take you to your quarters now. Dinner will be at eight to-night.'

'I'd rather skip dinner, thanks.'

'No one ever gets seasick on the *Dolphin*, I can assure you,' Swanson smiled.

'I'd appreciate the chance to sleep instead. I've had no sleep for almost three days and I've been travelling non-stop for the past fifty hours. I'm just tired, that's all.'

'That's a fair amount of travelling.' Swanson smiled. He seemed almost always to be smiling, and I supposed vaguely that there would be some people foolish enough to take that smile always at its face value. 'Where were you fifty hours ago, Doctor?'

'In the Antarctic.'

Admiral Garvie gave me a very old-fashioned look indeed, but he let it go at that.

TWO

When I awoke I was still heavy with sleep, the heaviness of a man who has slept for a long time. My watch said nine-thirty, and I knew it must be the next morning, not the same evening: I had been asleep for fifteen hours.

The cabin was quite dark. I rose, fumbled for the light switch, found it and looked around. Neither Hansen nor the engineer officer was there: they must have come in after I had gone to sleep and left before I woke. I looked around some more, and then I listened. I was suddenly conscious of the almost complete quiet, the stillness, the entire lack of any perceptible motion. I might have been in the bedroom of my own house. What had gone wrong? What hold-up had occurred? Why in God's name weren't we under way? I'd have sworn the previous night that Commander Swanson had been just as conscious of the urgency as I had been.

I had a quick wash in the folding Pullman-type basin, passed up the need for a shave, pulled on shirt, trousers and shoes and went outside. A few feet away a door opened to starboard off the passage. I went along and walked in. The officers' wardroom, without a doubt, with one of them still at breakfast, slowly munching his way through a huge plateful of steak, eggs and French fries, glancing at a magazine in a leisurely fashion and giving every impression of a man enjoying life to the luxurious

full. He was about my own age, big, inclined to fat – a common condition, I was to find, among the entire crew who ate so well and exercised so little – with close-cropped black hair already greying at the temples and a cheerful intelligent face. He caught sight of me, rose and stretched out a hand.

'Dr Carpenter, it must be. Welcome to the wardroom. I'm Benson. Take a seat, take a seat.'

I said something, appropriate but quick, then asked: 'What's wrong? What's been the hold-up? Why aren't we under way?'

'That's the trouble with the world to-day,' Benson said mournfully. 'Rush, rush, rush. And where does all the hurry get them? I'll tell you –'

'Excuse me. I must see the captain.' I turned to leave but he laid a hand on my arm.

'Relax, Dr Carpenter. We *are* at sea. Take a seat.'

'At sea? On the level? I don't feel a thing.'

'You never do when you're three hundred feet down. Maybe four hundred. I don't,' he said expansively, 'concern myself with those trifles. I leave them to the mechanics.'

'Mechanics?'

'The captain, engineer officer, people like those.' He waved a hand in a generously vague gesture to indicate the largeness of the concept he understood by the term 'mechanics'. 'Hungry?'

'We've cleared the Clyde?'

'Unless the Clyde extends to well beyond the north of Scotland, the answer to that is, yes, we have.'

'Come again?'

He grinned. 'At the last check we were well into the Norwegian Sea, about the latitude of Bergen.'

'This is still only Tuesday morning?' I don't know if I looked stupid: I certainly felt it.

'It's still only Tuesday morning.' He laughed. 'And if you can work out from that what kind of speed we have been making in the last fifteen hours we'd all be obliged if you'd keep it to yourself.' He leaned back in his seat and lifted his voice. 'Henry!'

A steward, white-jacketed, appeared from what I took to be the pantry. He was a tall thin character with a dark complexion and the long lugubrious face of a dyspeptic spaniel. He looked at Benson and said in a meaningful voice: '*Another* plate of French fries, Doc?'

'You know very well that I never have more than one helping of that carbohydrated rubbish,' Benson said with dignity. 'Not, at least, for breakfast. Henry, this is Dr Carpenter.'

'Howdy,' Henry said agreeably.

'Breakfast, Henry,' Benson said. 'And, remember, Dr Carpenter is a Britisher. We don't want him leaving with a low opinion of the chow served up in the United States Navy.'

'If anyone aboard this ship has a low opinion of the food,' Henry said darkly, 'they hide it pretty well. Breakfast. The works. Right away.'

'Not the works, for heaven's sake,' I said. 'There are some things we decadent Britishers can't face up to first thing in the

morning. One of them is French fries.'

He nodded approvingly and left. I said: 'Dr Benson, I gather.'

'Resident medical officer aboard the *Dolphin*, no less,' he admitted. 'The one who's had his professional competence called into question by having a competing practitioner called in.'

'I'm along for the ride. I assure you I'm not competing with anyone.'

'I know you're not,' he said quickly. Too quickly. Quickly enough so that I could see Swanson's hand in this, could see him telling his officers to lay off quizzing Carpenter too much. I wondered again what Swanson was going to say when and if we ever arrived at the Drift Station and he found out just how fluent a liar I was. Benson went on, smiling: 'There's no call for even one medico aboard this boat, far less two.'

'You're not overworked?' From the leisurely way he was going about his breakfast it seemed unlikely.

'Overworked! I've sick-bay call once a day and no one ever turns up – except the morning after we arrive in port with a long cruise behind us and then there are liable to be a few sore heads around. My main job, and what is supposed to be my speciality, is checking on radiation and atmosphere pollution of one kind or another – in the olden submarine days the atmosphere used to get pretty foul after only a few hours submerged but we have to stay down for months, if necessary.' He grinned. 'Neither job is very exacting. We issue each member of the crew with a dosimeter and periodically check a film badge for radiation

dosage – which is invariably less than you'd get sitting on the beach on a moderately warm day.

'The atmospheric problem is even easier. Carbon dioxide and carbon monoxide are the only things we have to worry about. We have a scrubbing machine that absorbs the breathed-out carbon dioxide from the atmosphere and pumps it out into the sea. Carbon monoxide – which we could more or less eliminate if we forbade cigarette smoking, only we don't want a mutiny on our hands when we're three hundred feet down – is burned to dioxide by a special heater and then scrubbed as usual. And even that hardly worries me, I've a very competent engineman who keeps those machines in tip-top condition.' He sighed. 'I've a surgery here that will delight your heart, Dr Carpenter. Operating table, dentist's chair, the lot, and the biggest crisis I've had yet is a cigarette burn between the fingers sustained by a cook who fell asleep during one of the lectures.'

'Lectures?'

'I've got to do something if I'm not to go round the bend. I spend a couple of hours a day keeping up with all the latest medical literature but what good is that if you don't get a chance to practise it? So I lecture. I read up about places we're going to visit and everyone listens to those talks. I give lectures on general health and hygiene and some of them listen to those. I give lectures on the perils of overeating and under-exercise and no one listens to those. I don't listen to them myself. It was during one of those that the cook got burned. That's why our friend Henry,

the steward, adopts his superior and critical attitude towards the eating habits of those who should obviously be watching their habits. He eats as much as any two men aboard but owing to some metabolic defect he remains as thin as a rake. Claims it's all due to dieting.'

'It all sounds a bit less rigorous than the life of the average G.P.'

'It is, it is.' He brightened. 'But I've got one job – a hobby to me – that the average G.P. can't have. The ice-machine. I've made myself an expert on that.'

'What does Henry think about it?'

'What? Henry?' He laughed. 'Not that kind of ice-machine. I'll show you later.'

Henry brought food and I'd have liked the *maîtres d'hôtel* of some allegedly five-star hotels in London to be there to see what a breakfast should be like. When I'd finished and told Benson that I didn't see that his lectures on the dangers of overweight were going to get him very far, he said: 'Commander Swanson said you might like to see over the ship. I'm at your complete disposal.'

'Very kind of you both. But first I'd like to shave, dress and have a word with the captain.'

'Shave if you like. No one insists on it. As for dress, shirt and pants are the rig of the day here. And the captain told me to tell you that he'd let you know immediately anything came through that could possibly be of any interest to you.'

So I shaved and then had Benson take me on a conducted tour of this city under the sea: the *Dolphin*, I had to admit, made any British submarine I'd ever seen look like a relic from the Ice Age.

To begin with, the sheer size of the vessel was staggering. So big had the hull to be to accommodate the huge nuclear reactor that it had internal accommodation equivalent to that of a 3,000-ton surface ship, with three decks instead of the usual one and lower hold found in the conventional submarine. The size, combined with the clever use of pastel paints for all accommodation spaces, working spaces and passageways, gave an overwhelming impression of lightness, airiness and above all, spaciousness.

He took me first, inevitably, to his sick-bay. It was at once the smallest and most comprehensively equipped surgery I'd ever seen, whether a man wanted a major operation or just a tooth filled, he could have himself accommodated there. Neither clinical nor utilitarian, however, was the motif Benson had adopted for the decoration of the one bulkhead in his surgery completely free from surgical or medical equipment of any kind – a series of film stills in colour featuring every cartoon character I'd ever seen, from Popeye to Pinocchio, with, as a two-foot square centrepiece, an immaculately cravatted Yogi Bear industriously sawing off from the top of a wooden signpost the first word of a legend which read 'Don't feed the bears.' From deck to deckhead, the bulkhead was covered with them.

'Makes a change from the usual pin-ups,' I observed.

'I get inundated with those, too,' Benson said regretfully. 'Film librarian, you know. Can't use them, supposed to be bad for discipline. However. Lightens the morgue-like atmosphere, what? Cheers up the sick and suffering, I like to think – and distracts their attention while I turn up page 217 in the old textbook to find out what's the matter with them.'

From the surgery we passed through the wardroom and officers' quarters and dropped down a deck to the crew's living quarters. Benson took me through the gleaming tiled washrooms, the immaculate bunk-room, then into the crew's mess hall.

'The heart of the ship,' he announced. 'Not the nuclear reactor, as the uninformed maintain, but here. Just look at it. Hifi, juke-box, record player, coffee machine, ice-cream machine, movie theatre, library and the home of all the card-sharps on the ship. What chance has a nuclear reactor against this lot? The old-time submariners would turn in their graves if they could see this: compared to the prehistoric conditions they lived in we must seem completely spoiled and ruined. Maybe we are, then again maybe we're not: the old boys never had to stay submerged for months at a time. This is also where I send them to sleep with my lectures on the evils of overeating.' He raised his voice for the benefit of seven or eight men who were sitting about the tables, drinking coffee, smoking and reading. 'You can observe for yourself, Dr Carpenter, the effects of my lectures in dieting and keeping fit. Did you ever see a bunch of more out-of-condition fat-bellied slobs in your life?'

The men grinned cheerfully. They were obviously well used to this sort of thing: Benson was exaggerating and they knew it. Each of them looked as if he knew what to do with a knife and fork when he got them in his hands, but that was about as far as it went. All had a curious similarity, big men and small men, the same characteristic as I'd seen in Zabrinski and Rawlings – an air of calmly relaxed competence, a cheerful imperturbability, that marked them out as being the men apart that they undoubtedly were.

Benson conscientiously introduced me to everyone, telling me exactly what their function aboard ship was and in turn informing them that I was a Royal Navy doctor along for an acclimatisation trip. Swanson would have told him to say this, it was near enough the truth and would stop speculation on the reason for my presence there.

Benson turned into a small compartment leading off the mess hall. 'The air purification room. This is Engineman Harrison. How's our box of tricks, Harrison?'

'Just fine, Doc, just fine. CO reading steady on thirty parts a million.' He entered some figures up in a log book, Benson signed it with a flourish, exchanged a few more remarks and left.

'Half my day's toil done with one stroke of the pen,' he observed. 'I take it you're not interested in inspecting sacks of wheat, sides of beef, bags of potatoes and about a hundred different varieties of canned goods.'

'Not particularly. Why?'

'The entire for'ard half of the deck beneath our feet – a storage hold, really – is given up mainly to that. Seems an awful lot, I know, but then a hundred men can get through an awful lot of food in three months, which is the minimum time we must be prepared to stay at sea if the need arises. We'll pass up the inspection of the stores, the sight of all that food just makes me feel I'm fighting a losing battle all the time, and have a look where the food's cooked.'

He led the way for'ard into the galley, a small square room all tiles and glittering stainless steel. A tall, burly, white-coated cook turned at our entrance and grinned at Benson. 'Come to sample to-day's lunch, Doc?'

'I have not,' Benson said coldly. 'Dr Carpenter, the chief cook and my arch-enemy, Sam MacGuire. What form does the excess of calories take that you are proposing to thrust down the throats of the crew to-day?'

'No thrusting required,' said MacGuire happily. 'Cream soup, sirloin of beef, no less, roast potatoes and as much apple pie as a man can cope with. All good nourishing food.'

Benson shuddered. He made to leave the galley, stopped and pointed at a heavy bronze ten-inch tube that stood about four feet above the deck of the galley. It had a heavy hinged lid and screwed clamps to keep the lid in position. 'This might interest you, Dr Carpenter. Guess what?'

'A pressure cooker?'

'Looks like it, doesn't it? This is our garbage disposal unit. In

the old days when a submarine had to surface every few hours garbage disposal was no problem, you just tipped the stuff over the side. But when you spend weeks on end cruising at three hundred feet you can't just walk up to the upper deck and tip the waste over the side: garbage disposal becomes quite a problem. This tube goes right down to the bottom of the *Dolphin*. There's a heavy watertight door at the lower end corresponding to this one, with interlocking controls which make it impossible for both doors to be open at the same time – it would be curtains for the *Dolphin* if they were. Sam here, or one of his henchmen, sticks the garbage into nylon mesh or polythene bags, weighs them with bricks –'

'Bricks, you said?'

'Bricks. Sam, how many bricks aboard this ship?'

'Just over a thousand at the latest count, Doc.'

'Regular builder's yard, aren't we?' Benson grinned. 'Those bricks are to ensure that the garbage bags sink to the bottom of the sea and not float to the surface – even in peacetime we don't want to give our position away to anyone. In go three or four bags, the top door is clamped shut and the bags pumped out under pressure. Then the outer door is closed again. Simple.'

'Yes.' For some reason or other this odd contraption had a curious fascination for me. Days later I was to remember my inexplicable interest in it and wonder whether, after all, I wasn't becoming psychic with advancing years.

'It's not worth all that attention,' Benson said good-

humouredly. 'Just an up-to-date version of the old rubbish chute. Come on, a long way to go yet.'

He led the way from the galley to a heavy steel door set in a transverse bulkhead. Eight massive clips to release, then replace after we had passed through the doorway.

'The for'ard torpedo storage room.' Benson's voice was lowered, for at least half of the sixteen or so bunks that lined the bulkheads or were jammed up close to the torpedoes and racks were occupied and every man occupying them was sound asleep. 'Only six torpedoes as you can see. Normally there's stowage for twelve plus another six constantly kept loaded in the torpedo tubes. But those six are all we have just now. We had a malfunction in two of our torpedoes of the newest and more or less untested radio-controlled type – during the Nato exercises just ended – and Admiral Garvie ordered the lot removed for inspection when we got back to the Holy Loch. The *Hunley*, that's our depot ship, carries experts for working on those things. However, they were no sooner taken off yesterday morning than this Drift Station operation came our way and Commander Swanson insisted on having at least six of them put back on straight away.' Benson grinned. 'If there's one thing a submarine skipper hates it's putting to sea without his torpedoes. He feels he might just as well stay at home.'

'Those torpedoes are still not operational?'

'I don't know whether they are or not. Our sleeping warriors here will do their best to find out when they come to.'

'Why aren't they working on them now?'

'Because before our return to the Clyde they were working on them for nearly sixty hours non-stop trying to find out the cause of the malfunction – and if it existed in the other torpedoes. I told the skipper that if he wanted to blow up the *Dolphin* as good a way as any was to let those torpedomen keep on working – they were starting to stagger around like zombies and a zombie is the last person you want to have working on the highly-complicated innards of a torpedo. So he pulled them off.'

He walked the length of the gleaming torpedoes and halted before another steel door in a cross bulkhead. He opened this, and beyond, four feet away, was another such heavy door set in another such bulkhead. The sills were about eighteen inches above deck level.

'You don't take many chances in building these boats, do you?' I asked. 'It's like breaking into the Bank of England.'

'Being a nuclear sub doesn't mean that we're not as vulnerable to underwater hazards as the older ships,' Benson said. 'We are. Ships have been lost before because the collision bulkhead gave way. The hull of the *Dolphin* can withstand terrific pressures, but a relatively minor tap from a sharp-edged object can rip us wide like an electric can-opener. The biggest danger is surface collision which nearly always happens at the bows. So, to make doubly sure in the event of a bows collision, we have those double collision bulkheads – the first submarine ever to have them. Makes fore and aft movement here a bit difficult but you've no

idea how much more soundly we all sleep at night.'

He closed the after door behind him and opened the for'ard one: we found ourselves in the for'ard torpedo room, a narrow cramped compartment barely long enough to permit torpedoes to be loaded or withdrawn from their tubes. Those tubes, with their heavy-hinged rear doors, were arranged close together in two vertical banks of three. Overhead were the loading rails with heavy chain tackles attached. And that was all. No bunks in here and I didn't wonder: I wouldn't have liked to be the one to sleep for'ard of those collision bulkheads.

We began to work our way aft and had reached the mess hall when a sailor came up and said that the captain wanted to see me. I followed him up the wide central stairway into the control room, Dr Benson a few paces behind to show that he wasn't being too inquisitive. Commander Swanson was waiting for me by the door of the radio room.

'Morning, Doctor. Slept well?'

'Fifteen hours. What do you think? And breakfasted even better. What's up, Commander?' Something was up, that was for sure: for once, Commander Swanson wasn't smiling.

'Message coming through about Drift Station Zebra. Has to be decoded first but that should take minutes only.' Decoding or not, it seemed to me that Swanson already had a fair idea of the content of that message.

'When did we surface?' I asked. A submarine loses radio contact as soon as it submerges.

'Not since we left the Clyde. We are close on three hundred feet down right now.'

'This is a *radio* message that's coming through?'

'What else? Times have changed. We still have to surface to transmit but we can receive down to our maximum depth. Somewhere in Connecticut is the world's largest radio transmitter using an extremely low frequency which can contact us at this depth far more easily than any other radio station can contact a surface ship. While we're waiting, come and meet the drivers.'

He introduced me to some of his control centre crew – as with Benson it seemed to be a matter of complete indifference to him whether it was officer or enlisted man – finally stopped by an officer sitting just aft of the periscope stand, a youngster who looked as if he should still be in high school. 'Will Raeburn,' Swanson said. 'Normally we pay no attention to him but after we move under the ice he becomes the most important man on the ship. Our navigation officer. Are we lost, Will?'

'We're just there, Captain.' He pointed to a tiny pinpoint of light on the Norwegian Sea chart spread out below the glass on the plotting-table. 'Gyro and sins are checking to a hair.'

'Sins?' I said.

'You may well look surprised, Dr Carpenter,' Swanson said. 'Lieutenant Raeburn here is far too young to have any sins. He is referring to S.I.N.S. – Ship's Inertial Navigational System – a device once used for guiding intercontinental missiles and now adapted for submarine use, specifically nuclear submarines. No

point in my elaborating, Will's ready to talk your head off about it if he manages to corner you.' He glanced at the chart position. 'Are we getting along quickly enough to suit you, Doctor?'

'I still don't believe it,' I said.

'We cleared the Holy Loch a bit earlier than I expected, before seven,' Swanson admitted. 'I had intended to carry out some slow-time dives to adjust trim – but it wasn't necessary. Even the lack of twelve torpedoes up in the nose didn't make her as stern-heavy as I'd expected. She's so damned big that a few tons more or less here or there doesn't seem to make any difference to her. So we just came haring on up –'

He broke off to accept a signal sheet from a sailor, and read through it slowly, taking his time about it. Then he jerked his head, walked to a quiet corner of the control centre and faced me as I came up to him. He still wasn't smiling.

'I'm sorry,' he said. 'Major Halliwell, the commandant of the Drift Station – you said last night he was a very close friend of yours?'

I felt my mouth begin to go dry. I nodded, took the message from him. It read: 'A further radio message, very broken and difficult to decipher, was received 0945 Greenwich Mean Time from Drift Ice Station Zebra by the British trawler *Morning Star*, the vessel that picked up the previous broadcast. Message stated that Major Halliwell, Officer Commanding, and three others unnamed critically injured or dead, no indication who or how many of the four are dead. Others, number again unknown,

suffering severely from burns and exposure. Some message about food and fuel, atmospheric conditions and weakness in transmission made it quite indecipherable. Understood from very garbled signal that survivors in one hut, unable to move because of weather. Word 'ice-storm' clearly picked up. Apparently details of wind speed and temperature but unable to make out.

'*Morning Star* several times attempted contact Drift Station Zebra immediately afterwards. No acknowledgment.

'*Morning Star*, at request of British Admiralty, has abandoned fishing grounds and is moving closer in to Barrier to act as listening post. Message ends.'

I folded the paper and handed it back to Swanson. He said again: 'Sorry about this, Carpenter.'

'Critically injured or dead,' I said. 'In a burnt-out station on the ice-cap in winter, what's the difference?' My voice fell upon my ears as the voice of another man, a voice flat and lifeless, a voice empty of all emotion. 'Johnny Halliwell and three of his men. Johnny Halliwell. Not the kind of man you would meet often, Commander. A remarkable man. Left school at fifteen when his parents died to devote himself to the support of a brother eight years younger than himself. He slaved, he scraped, he sacrificed, he devoted many of the best years of his life to doing everything for his young brother, including putting him through a six-year University course. Not till then did he think of himself, not till then did he get married. He leaves a lovely wife and three marvellous kids. Two nieces and a nephew not yet

six months old.'

'Two nieces –' He broke off and stared at me. 'Good God, your brother? *Your* brother?' He didn't, for the moment, seem to find anything peculiar in the difference of surname.

I nodded silently. Young Lieutenant Raeburn approached us, an odd expression of anxiety on his face, but Swanson abruptly waved him away without seeming even to glance in his direction. He shook his head slowly and was still shaking it when I said abruptly: 'He's tough. He may be one of the survivors. He may live. We must get Drift Station Zebra's position. We *must* get it.'

'Maybe they haven't got it themselves,' Swanson said. You could see he was grateful for something to talk about. 'It *is* a drifting station, remember. The weather being what it is, it may have been days since they got their last fixes – and for all we know their sextants, chronometers and radio direction finders have been lost in the fire.'

'They must know what their latest fix was, even although it was a week ago. They must have a fairly accurate idea of the speed and direction of their drift. They'll be able to provide approximate data. The *Morning Star* must be told to keep transmitting non-stop with a continuous request for their position. If you surface now, can you contact the *Morning Star*?'

'I doubt it. The trawler must be the best part of a thousand miles north of us. His receiver wouldn't be big enough to pull us in – which is another way of saying that our transmitter is too small.'

'The B.B.C. have plenty of transmitters that are big enough. So have the Admiralty. Please ask one or other to contact the *Morning Star* and ask it to make a continuous send for Zebra's position.'

'They could do that themselves direct.'

'Sure they could. But they couldn't hear the reply. The *Morning Star* can – if there's any reply. And she's getting closer to them all the time.'

'We'll surface now,' Swanson nodded. He turned away from the chart table we'd been standing beside and headed for the diving stand. As he passed the plotting table he said to the navigator: 'What was it you wanted, Will?'

Lieutenant Raeburn turned his back on me and lowered his voice, but my hearing has always been a little abnormal. He whispered: 'Did you see his face, Captain? I thought he was going to haul off and clobber you one.'

'I thought the same thing myself,' Swanson murmured. 'For a moment. But I think I just happened to be in his line of vision, that's all.'

I went forward to my cabin and lay down in the cot.

THREE

'There it is, then,' said Swanson. 'That's the Barrier.'

The *Dolphin*, heading due north, her great cylindrical bulk at one moment completely submerged, the next showing clear as she rolled heavily through the steep quartering seas, was making less than three knots through the water, the great nuclear-powered engines providing just enough thrust to the big twin eight-foot propellers to provide steerage way and no more: thirty feet below where we stood on the bridge the finest sonar equipment in the world was ceaselessly probing the waters all around us but even so Swanson was taking no chances on the effects of collision with a drifting ice-block. The noonday Arctic sky was so overcast that the light was no better than that of late dusk. The bridge thermometer showed the sea temperature as 28° F., the air temperature as –16° F. The gale-force wind from the north-east was snatching the tops off the rolling steel-grey waves and subjecting the steep-walled sides of the great conning-tower – sail, the crew called it – to the ceaseless battering of a bullet-driven spray that turned to solid ice even as it struck. The cold was intense.

Shivering uncontrollably, wrapped in heavy duffel-coat and oilskins and huddled against the illusory shelter of the canvas wind-dodger, I followed the line of Swanson's pointing arm: even above the high thin shrill whine of the wind and the drum-fire of

the flying spray against the sail, I could hear the violent chattering of his teeth. Less than two miles away a long, thin, greyish-white line, at that distance apparently smooth and regular, seemed to stretch the entire width of the northern horizon. I'd seen it before and it wasn't much to look at but it was a sight a man never got used to, not because of itself but because of what it represented, the beginning of the polar ice-cap that covered the top of the world, at this time of year a solid compacted mass of ice that stretched clear from where we lay right across to Alaska on the other side of the world. And we had to go under that mass. We had to go under it to find men hundreds of miles away, men who might be already dying, men who might be already dead. Who probably were dead. Men, dying or dead, whom we had to seek out by guess and by God in that great wasteland of ice stretching out endlessly before us, for we did not know where they were.

The relayed radio message we had received just forty-nine hours previously had been the last. Since then, there had been only silence. The trawler *Morning Star* had been sending almost continuously in the intervening two days, trying to raise Drift Station Zebra, but out of that bleak desert of ice to the north had come nothing but silence. No word, no signal, no faintest whisper of sound had come out of that desolation.

Eighteen hours previously the Russian atomic-engined *Dvina* had reached the Barrier and had started on an all-out and desperate attempt to smash its way into the heart of the ice-cap. In this early stage of winter the ice was neither so thick

nor so compacted as it would be at the time of its maximum density, in March, and the very heavily armoured and powerfully engined *Dvina* was reputed to be able to break through ice up to a thickness of eighteen feet: given fair conditions, the *Dvina* was widely believed to be capable of battering its way to the North Pole. But the conditions of the rafted ice had proved abnormal to a degree and the attempt a hopeless one. The *Dvina* had managed to crash its way over forty miles into the ice-cap before being permanently stopped by a thick wall of rafted ice over twenty feet in height and probably more than a hundred deep. The *Dvina*, according to reports, had sustained heavy damage to its bows and was still in the process of extricating itself, with the greatest difficulty, from the pack. A very gallant effort that had achieved nothing except an improvement in East-West relations to an extent undreamed of for many years.

Nor had the Russian efforts stopped there. Both they and the Americans had made several flights over the area with front-line long-range bombers. Through the deep overcast and driving ice- and snow-filled winds those planes had criss-crossed the suspected area a hundred times, searching with their fantastically accurate radar. But not one single radar sighting had been reported. Various reasons had been put forward to explain the failure, especially the failure of the Strategic Air Command's B52 bomber whose radar was known to be easily capable of picking out a hut against contrasting background from ten thousand feet and in pitch darkness. It had been suggested that

the huts were no longer there: that the radar's eye was unable to distinguish between an ice-sheathed hut and the thousands of ice-hummocks which dot the polar cap in winter; and that they had been searching in the wrong area in the first place. The most probable explanation was that the radar waves had been blurred and deflated by the dense clouds of ice-spicules blowing over the area. Whatever the reason, Drift Ice Station Zebra remained as silent as if no life had ever been there, as lost as if it had never existed.

'There's no percentage in staying up here and getting frozen to death.' Commander Swanson's voice was a half-shout, it had to be to make him heard. 'If we're going under that ice, we might as well go now.' He turned his back to the wind and stared out to the west where a big broad-beamed trawler was rolling heavily and sluggishly in the seas less than a quarter of a mile away. The *Morning Star*, which had closed right up to the edge of the ice-pack over the last two days, listening, waiting, and all in vain, was about to return to Hull: her fuel reserves were running low.

'Make a signal,' Swanson said to the seaman by his side. '"We are about to dive and proceed under the ice. We do not expect to emerge for minimum four days, are prepared to remain maximum fourteen."' He turned to me and said: 'If we can't find them in that time …' and left the sentence unfinished.

I nodded, and he went on: '"Many thanks for your splendid co-operation. Good luck and a safe trip home."' As the signalman's lamp started chattering out its message, he said wonderingly: 'Do

those fishermen trawl up in the Arctic the entire winter?'

'They do.'

'The whole winter. Fifteen minutes and I'm about dead. Just a bunch of decadent Limeys, that's what they are.' A lamp aboard the *Morning Star* flickered for some seconds and Swanson said: 'What reply?'

'"Mind your heads under that ice. Good luck and goodbye."'

'Everybody below,' Swanson said. As the signalman began to strip the canvas dodger I dropped down a ladder into a small compartment beneath, wriggled through a hatch and down a second ladder to the pressure hull of the submarine, another hatch, a third ladder and then I was on the control deck of the *Dolphin*. Swanson and the signalman followed, then last of all Hansen, who had to close the two heavy watertight doors above.

Commander Swanson's diving technique would have proved a vast disappointment to those brought up on a diet of movie submarines. No frenzied activity, no tense steely-eyed men hovering over controls, no Tannoy calls of 'Dive, dive, dive,' no blaring of klaxons. Swanson reached down a steel-spring microphone, said quietly: 'This is the captain. We are about to move under the ice. Diving now,' hung up and said: 'Three hundred feet.'

The chief electronics technician leisurely checked the rows of lights indicating all hatches, surface openings and valves closed to the sea. The disc lights were out: the slot lights burned brightly. Just as leisurely he re-checked them, glanced at Swanson and

said: 'Straight line shut, sir.' Swanson nodded. Air hissed loudly out of the ballast tanks, and that was it. We were on our way. It was about as wildly exciting as watching a man push a wheelbarrow. And there was something oddly reassuring about it all.

Ten minutes later Swanson came up to me. In the past two days I'd come to know Commander Swanson fairly well, like him a lot and respect him tremendously. The crew had complete and implicit faith in him. I was beginning to have the same thing. He was a kindly genial man with a vast knowledge of every aspect of submarining, a remarkable eye for detail, an even more remarkably acute mind and an imperturbability that remained absolute under all conditions. Hansen, his executive officer and clearly no respecter of persons, had said flatly that Swanson was the best submarine officer in the Navy. I hoped he was right, that was the kind of man I wanted around in conditions like those.

'We're about to move under the ice now, Dr Carpenter,' he said. 'How do you feel about it?'

'I'd feel better if I could see where we were going.'

'We can see,' he said. 'We've the best eyes in the world aboard the *Dolphin*. We've got eyes that look down, around, ahead and straight up. Our downward eye is the fathometer or echo-sounder that tells us just how deep the water below our keel is – and as we have about five thousand feet of water below our keel at this particular spot we're hardly likely to bump into underwater projections and its use right now is purely a formality. But no

responsible navigation officer would ever think of switching it off. We have two sonar eyes for looking around and ahead, one sweeping the ship, another searching out a fifteen-degree path on either side of the bow. Sees everything, hears everything. You drop a spanner on a warship twenty miles away and we know all about it. Fact. Again it seems purely a formality. The sonar is searching for underwater ice stalactites forced down by the pressure of rafted ice above, but in five trips under the ice and two to the Pole I've never seen underwater stalactites or ridges deeper than 200 feet, and we're at 300 feet now. But we still keep them on.'

'You might bump into a whale?' I suggested.

'We might bump into another submarine.' He wasn't smiling. 'And that would be the end of both of us. What with the Russian and our own nuclear submarines busy criss-crossing to and fro across the top of the world the underside of the polar ice-cap is getting more like Times Square every day.'

'But surely the chances –'

'What are the chances of mid-air collision to the only two aircraft occupying ten thousand square miles of sky? On paper, they don't exist. There have been three such collisions this year already. So we keep the sonar pinging. But the really important eye, when you're under the ice, is the one that looks up. Come and have a squint at it.'

He led the way to the after starboard end of the control room where Dr Benson and another man were busy studying a glassed-

in eye-level machine which outwardly consisted of a seven-inch-wide moving ribbon of paper and an inked stylus that was tracing a narrow straight black line along it. Benson was engrossed in adjusting some of the calibrated controls.

'The surface fathometer,' Swanson said. 'Better known as the ice-machine. It's not really Dr Benson's machine at all, we have two trained operators aboard, but as we see no way of separating him from it without actually court-martialling him, we take the easy way out and let him be.' Benson grinned, but his eye didn't leave the line traced by the stylus. 'Same principle as the echo-sounding machine, it just bounces an echo back from the ice – when there is any. That thin black line you see means open water above. When we move under the ice the stylus has an added vertical motion which not only indicates the presence of ice but also gives us its thickness.'

'Ingenious,' I said.

'It's more than that. Under the ice it can be life or death for the *Dolphin*. It certainly means life or death for Drift Station Zebra. If we ever get its position we can't get at it until we break through the ice and this is the only machine that can tell us where the ice is thinnest.'

'No open water at this time of year? No leads?'

'Polynyas, we call them. None. Mind you, the ice-pack is never static, not even in winter, and surface pressure changes can very occasionally tear the ice apart and expose open water. With air temperatures such as you get in winter you can guess how long

the open water stays in a liquid condition. There's a skin of ice on it in five minutes, an inch in an hour and a foot inside two days. If we get to one of those frozen over polynyas inside, say, three days, we've a fair chance of breaking through.'

'With the conning-tower?'

'That's it. The sail. All new nuclear subs have specially strengthened sails designed for one purpose only – breaking through Arctic ice. Even so we have to go pretty gently as the shock, of course, is transmitted to the pressure hull.'

I thought about this a bit then said: 'What happens to the pressure hull if you come up too fast – as I understand may happen with a sudden change in salinity and sea temperature – and you find out at the last minute that you've drifted away from the indicated area of thin ice and have ten solid feet of the stuff above you?'

'That's it,' he said. 'Like you say, it's the last minute. Don't even think about such things, far less talk about them: I can't afford to have nightmares on this job.' I looked at him closely, but he wasn't smiling any more. He lowered his voice. 'I don't honestly think that there is one member of the crew of the *Dolphin* who doesn't get a little bit scared when we move in under the ice. I know I do. I think this is the finest ship in the world, Dr Carpenter, but there are still a hundred things that can go wrong with it and if anything happens to the reactor or the steam turbines or the electrical generators – then we're already in our coffin and the lid screwed down. The ice-pack above is the coffin

lid. In the open sea most of those things don't matter a damn – we just surface or go to snorkel depth and proceed on our diesels. But for diesels you need air – and there's no air under the ice-pack. So if anything happens we either find a polynya to surface in, one chance in ten thousand at this time of year, before our standby battery packs up or – well, that's it.'

'This is all very encouraging,' I said.

'Isn't it?' He smiled, none too soon for me. 'It'll never happen. What's the worthy Benson making all the racket about?'

'Here it is,' Benson called. 'The first drift-block. And another. And another! Come and have a look, Doctor.'

I had a look. The stylus, making a faint soft hissing sound, was no longer tracing out a continuously horizontal line but was moving rapidly up and down across the paper, tracing out the outline of the block of ice passing astern above us. Another thin straight line, more agitated vertical movements of the stylus, and again another block of ice had gone. Even as I watched the number of thin horizontal lines became fewer and fewer and shorter and shorter until eventually they disappeared altogether.

'That's it, then,' Swanson nodded. 'We'll take her deep now, real deep, and open up all the stops.'

When Commander Swanson had said he was going to hurry, he'd meant every word of it. In the early hours of the following morning I was awakened from a deep sleep by a heavy hand on my shoulder. I opened my eyes, blinked against the glare of the overhead light then saw Lieutenant Hansen.

'Sorry about the beauty sleep, Doc,' he said cheerfully. 'But this is it.'

'This is what?' I said irritably.

'85° 35′ north, 21° 20′ east – the last estimated position of Drift Station Zebra. At least, the last estimated position with estimated correction for polar drift.'

'Already?' I glanced at my watch, not believing it. 'We're there already?'

'We have not,' Hansen said modestly, 'been idling. The skipper suggests you come along and watch us at work.'

'I'll be right with you.' When and if the *Dolphin* managed to break through the ice and began to try her one in a million chance of contacting Drift Station Zebra, I wanted to be there.

We left Hansen's cabin and had almost reached the control room when I lurched, staggered and would have fallen but for a quick grab at a handrail that ran along one side of the passageway. I hung on grimly as the *Dolphin* banked violently sideways and round like a fighter plane in a tight turn. No submarine in my experience had ever been able to begin to behave even remotely in that fashion. I understood now the reasons for the safety belts on the diving control seats.

'What the hell's up?' I said to Hansen. 'Avoiding some underwater obstruction ahead?'

'Must be a possible polynya. Some place where the ice is thin, anyway. As soon as we spot a possible like that we come around like a chicken chasing its own tail just so we don't miss it. It

makes us very popular with the crew, especially when they're drinking coffee or soup.'

We passed into the control room. Commander Swanson, flanked by the navigator and another man, was bent over the plotting table, examining something intently. Farther aft a man at the surface fathometer was reading out ice thickness figures in a quiet unemotional voice. Commander Swanson looked up from the chart.

'Morning, Doctor. John, I think we may have something here.'

Hansen crossed to the plot and peered at it. There didn't seem to be much to peer at – a tiny pin-point of light shining through the glass top of the plot and a squared sheet of chart paper marked by a most unseamanlike series of wavering black lines traced out by a man with a pencil following the track of the tiny moving light. There were three red crosses superimposed on the paper, two very close together, and just as Hansen was examining the paper the crewman manning the ice-machine – Dr Benson's enthusiasm for his toy did not, it appeared, extend to the middle of the night – called out 'Mark!' Immediately the black pencil was exchanged for a red and a fourth cross made.

'"Think" and "may" are just about right, Captain,' Hansen said. 'It looks awfully narrow to me.'

'It looks the same way to me, too,' Swanson admitted. 'But it's the first break in the heavy ice that we've had in an hour, almost. And the farther north we go, the poorer our chances. Let's give it a go. Speed?'

'One knot,' Raeburn said.

'All back one-third,' Swanson said. No sharp imperatives, not ever, in the way Swanson gave his orders, more a quiet and conversational suggestion, but there was no mistaking the speed with which one of the crewmen strapped into the diving-stand bucket seat leaned forward to telegraph the order to the engine-room. 'Left full rudder.'

Swanson bent over to check the plot, closely watching the tiny pin-point of light and tracing pencil move back towards the approximate centre of the elongated quadrangle formed by the four red crosses. 'All stop,' he went on. 'Rudder amidships.' A pause then: 'All ahead one-third. So. All stop.'

'Speed zero,' Raeburn said.

'120 feet,' Swanson said to the diving officer. 'But gently, gently.'

A strong steady hum echoed in the control centre. I asked Hansen: 'Blowing ballast?'

He shook his head. 'Just pumping the stuff out. Gives a far more precise control of rising speed and makes it easier to keep the sub on an even keel. Bringing a stopped sub up on a dead even keel is no trick for beginners. Conventional subs never try this sort of thing.'

The pumps stopped. There came the sound of water flooding back into the tanks as the diving officer slowed up the rate of ascent. The sound faded.

'Secure flooding,' the diving officer said. 'Steady on 120 feet.'

'Up periscope,' Swanson said to the crewman by his side. An overhead lever was engaged and we could hear the hiss of high-pressure oil as the hydraulic piston began to lift the starboard periscope off its seating. The gleaming cylinder rose slowly against the pressure of the water outside until finally the foot of the periscope cleared its well. Swanson opened the hinged handgrips and peered through the eyepiece.

'What does he expect to see in the middle of the night at this depth?' I asked Hansen.

'Never can tell. It's rarely completely dark, as you know. Maybe a moon, maybe only stars – but even starlight will show as a faint glow through the ice – if the ice is thin enough.'

'What's the thickness of the ice above, in this rectangle?'

'The sixty-four thousand dollar question,' Hansen admitted, 'and the answer is that we don't know. To keep that ice-machine to a reasonable size the graph scale has to be very small. Anything between four and forty inches. Four inches we go through like the icing on a wedding cake: forty inches and we get a very sore head indeed.' He nodded across to Swanson. 'Doesn't look so good. That grip he's twisting is to tilt the periscope lens upwards and that button is for focusing. Means he's having trouble in finding anything.'

Swanson straightened. 'Black as the Earl of Hell's waistcoat,' he said conversationally. 'Switch on hull and sail floodlights.'

He stooped and looked again. For a few seconds only. 'Pea-soup. Thick and yellow and strong. Can't see a thing. Let's have

the camera, shall we?'

I looked at Hansen, who nodded to a white screen that had just been unshuttered on the opposite bulkhead. 'All mod cons, Doc. Closed circuit TV. Camera is deck mounted under toughened glass and can be remotely controlled to look up or round.'

'You could do with a new camera, couldn't you?' The TV screen was grey, fuzzy, featureless.

'Best that money can buy,' Hansen said. 'It's the water. Under certain conditions of temperature and salinity it becomes almost completely opaque when floodlit. Like driving into a heavy fog with your headlights full on.'

'Floodlights off,' Swanson said. The screen became quite blank. 'Floodlights on.' The same drifting misty grey as before. Swanson sighed and turned to Hansen. 'Well, John?'

'If I were paid for imagining things,' Hansen said carefully, 'I could imagine I see the top of the sail in that left corner. Pretty murky out there, Captain. Heigh-ho for the old blind man's buff, is that it?'

'Russian roulette, I prefer to call it.' Swanson had the clear unworried face of a man contemplating a Sunday afternoon in a deck-chair. 'Are we holding position?'

'I don't know.' Raeburn looked up from the plot. 'It's difficult to be sure.'

'Sanders?' This to the man at the ice-machine.

'Thin ice, sir. Still thin ice.'

'Keep calling. Down periscope.' He folded the handles up and

turned to the diving officer. 'Take her up like we were carrying a crate of eggs atop the sail and didn't want to crack even one of them.'

The pumps started again. I looked around the control room. Swanson excepted, everyone was quiet and still and keyed-up. Raeburn's face was beaded with sweat and Sanders's voice was too calm and impersonal by half as he kept repeating: 'Thin ice, thin ice,' in a low monotone. You could reach out and touch the tension in the air. I said quietly to Hansen:

'Nobody seems very happy. There's still a hundred feet to go.'

'There's forty feet,' Hansen said shortly. 'Readings are taken from keel level and there's sixty feet between the keel and the top of the sail. Forty feet minus the thickness of the ice – and maybe a razor-sharp or needle-pointed stalactite sticking down ready to skewer the *Dolphin* through the middle. You know what that means?'

'That it's time I started getting worried too?'

Hansen smiled, but he wasn't feeling like smiling. Neither was I, not any more.

'Ninety feet,' the diving officer said.

'Thin ice, thin ice,' Sanders intoned.

'Switch off the deck flood, leave the sail flood on,' Swanson said. 'And keep that camera moving. Sonar?'

'All clear,' the sonar operator reported. 'All clear all round.' A pause, then: 'No, hold it, hold it! Contact dead astern!'

'How close?' Swanson asked quickly.

'Too close to say. Very close.'

'She's jumping!' the diving officer called out sharply. '80, 75.' The *Dolphin* had hit a layer of colder water or extra salinity.

'Heavy ice, heavy ice!' Sanders called out urgently.

'Flood emergency!' Swanson ordered – and this time it was an order.

I felt the sudden build-up of air pressure as the diving officer vented the negative tank and tons of sea-water poured into the emergency diving tank, but it was too late. With a shuddering jarring smash that sent us staggering the *Dolphin* crashed violently into the ice above, glass tinkled, lights went out and the submarine started falling like a stone.

'Blow negative to the mark!' the diving officer called. High pressure air came boiling into the negative tank – at our rate of falling we would have been flattened by the sea-pressure before the pumps could even have begun to cope with the huge extra ballast load we had taken aboard in seconds. Two hundred feet, two hundred and fifty and we were still falling. Nobody spoke, everybody just stood or sat in a frozen position staring at the diving stand. It required no gift for telepathy to know the thought in every mind. It was obvious that the *Dolphin* had been struck aft by some underwater pressure ridge at the same instant as the sail had hit the heavy ice above: if the *Dolphin* had been holed aft this descent wasn't going to stop until the pressure of a million tons of water had crushed and flattened the hull and in a flicker of time snuffed out the life of every man inside it.

'Three hundred feet,' the diving officer called out. 'Three fifty – and she's slowing! She's slowing.'

The *Dolphin* was still falling, sluggishly passing the four-hundred-foot mark, when Rawlings appeared in the control room, tool-kit in one hand, a crate of assorted lamps in the other.

'It's unnatural,' he said. He appeared to be addressing the shattered lamp above the plot which he had immediately begun to repair. 'Contrary to the laws of nature, I've always maintained. Mankind was never meant to probe beneath the depths of the ocean. Mark my words, those new-fangled inventions will come to a bad end.'

'So will you, if you don't keep quiet,' Commander Swanson said acidly. But there was no reprimand in his face, he appreciated as well as any of us the therapeutic breath of fresh air that Rawlings had brought into that tension-laden atmosphere. 'Holding?' he went on to the diving officer.

The diving officer raised a finger and grinned. Swanson nodded, swung the coiled-spring microphone in front of him. 'Captain here,' he said calmly. 'Sorry about that bump. Report damage at once.'

A green light flashed in the panel of a box beside him. Swanson touched a switch and a loudspeaker in the deck-head crackled.

'Manoeuvring room here.' The manoeuvring room was in the after end of the upper level engine-room, towards the stern. 'Hit was directly above us here. We could do with a box of candles

and some of the dials and gauges are out of kilter. But we still got a roof over our heads.'

'Thank you, Lieutenant. You can cope?'

'Sure we can.'

Swanson pressed another switch. 'Stern room?'

'We still attached to the ship?' a cautious voice inquired.

'You're still attached to the ship,' Swanson assured him. 'Anything to report?'

'Only that there's going to be an awful lot of dirty laundry by the time we get back to Scotland. The washing-machine's had a kind of fit.'

Swanson smiled and switched off. His face was untroubled, he must have had a special sweat-absorbing mechanism on his face, I felt I could have done with a bath towel. He said to Hansen: 'That was bad luck. A combination of a current where a current had no right to be, a temperature inversion where a temperature inversion had no right to be, and a pressure ridge where we least expected it. Not to mention the damned opacity of the water. What's required is a few circuits until we know this polynya like the backs of our hands, a small offset to allow for drift and a little precautionary flooding as we approach the ninety-foot mark.'

'Yes, sir. That's what's required. Point is, what are we going to do?'

'Just that. Take her up and try again.'

I had my pride so I refrained from mopping my brow. They took her up and tried again. At 200 feet and for fifteen minutes

Swanson juggled propellers and rudder till he had the outline of the frozen polynya above as accurately limned on the plot as he could ever expect to have it. Then he positioned the *Dolphin* just outside one of the boundary lines and gave an order for a slow ascent.

'One twenty feet,' the diving officer said. 'One hundred ten.'

'Heavy ice,' Sanders intoned. 'Still heavy ice.'

Sluggishly the *Dolphin* continued to rise. Next time in the control room, I promised myself, I wouldn't forget that bath towel. Swanson said: 'If we've overestimated the speed of the drift, there's going to be another bump I'm afraid.' He turned to Rawlings who was still busily repairing lights. 'If I were you, I'd suspend operations for the present. You may have to start all over again in a moment and we don't carry all that number of spares aboard.'

'One hundred feet,' the diving officer said. He didn't sound as unhappy as his face looked.

'The water's clearing,' Hansen said suddenly. 'Look.'

The water had cleared, not dramatically so, but enough. We could see the top corner of the sail clearly outlined on the TV screen. And then, suddenly, we could see something else again, heavy ugly ridged ice not a dozen feet above the sail.

Water flooding into the tanks. The diving officer didn't have to be told what to do, we'd gone up like an express lift the first time we'd hit a different water layer and once like that was enough in the life of any submarine.

'Ninety feet,' he reported. 'Still rising.' More water flooded in, then the sound died away. 'She's holding. Just under ninety feet.'

'Keep her there.' Swanson stared at the TV screen. 'We're drifting clear and into the polynya – I hope.'

'Me too,' Hansen said. 'There can't be more than a couple of feet between the top of the sail and that damned ugly stuff.'

'There isn't much room,' Swanson acknowledged. 'Sanders?'

'Just a moment, sir. The graph looks kinda funny – no, we're clear.' He couldn't keep the excitement out of his voice. 'Thin ice!'

I looked at the screen. He was right. I could see the vertical edge of a wall of ice move slowly across the screen, exposing clear water above.

'Gently, now, gently,' Swanson said. 'And keep the camera on the ice wall at the side, then straight up, turn about.'

The pumps began to throb again. The ice wall, less than ten yards away, began to drift slowly down past us.

'Eighty-five feet,' the diving officer reported. 'Eighty.'

'No hurry,' Swanson said. 'We're sheltered from that drift by now.'

'Seventy-five feet.' The pumps stopped, and water began to flood into the tanks. 'Seventy.' The *Dolphin* was almost stopped now, drifting upwards as gently as thistledown. The camera switched upwards, and we could see the top corner of the sail clearly outlined with a smooth ceiling of ice floating down to meet it. More water gurgled into the tanks, the top of the sail met

the ice with a barely perceptible bump and the *Dolphin* came to rest.

'Beautifully done,' Swanson said warmly to the diving officer. 'Let's try to give that ice a nudge. Are we slewing?'

'Bearing constant.'

Swanson nodded. The pumps hummed, pouring out water, lightening ship, steadily increasing positive buoyancy. The ice stayed where it was. More time passed, more water pumped out, and still nothing happened. I said softly to Hansen: 'Why doesn't he blow the main ballast? You'd get a few hundred tons of positive buoyancy in next to no time and even if that ice is forty inches thick it couldn't survive all that pressure at a concentrated point.'

'Neither could the *Dolphin*,' Hansen said grimly. 'With a suddenly induced big positive buoyancy like that, once she broke through she'd go up like a cork from a champagne bottle. The pressure hull might take it, I don't know, but sure as little apples the rudder would be squashed flat as a piece of tin. Do you want to spend what little's left of your life travelling in steadily decreasing circles under the polar ice-cap?'

I didn't want to spend what little was left of my life travelling in steadily decreasing circles under the ice-cap so I kept quiet. I watched Swanson as he walked across to the diving stand and studied the banked dials in silence for some seconds. I was beginning to become a little apprehensive about what Swanson would do next: I was beginning to realise, and not slowly either,

that he was a lad who didn't give up very easily.

'That's enough of that lot,' he said to the diving officer. 'If we go through now with all this pressure behind us we'll be airborne. This ice is even thicker than we thought. We've tried the long steady shove and it hasn't worked. A sharp tap is obviously what is needed. Flood her down, but gently, to eighty feet or so, a good sharp whiff of air into the ballast tanks and we'll give our well-known imitation of a bull at a gate.'

Whoever had installed the 240-ton air-conditioning unit in the *Dolphin* should have been prosecuted, it just wasn't working any more. The air was very hot and stuffy – what little there was of it, that was. I looked around cautiously and saw that everyone else appeared to be suffering from this same shortage of air, all except Swanson, who seemed to carry his own built-in oxygen cylinder around with him. I hoped Swanson was keeping in mind the fact that the *Dolphin* had cost 120 million dollars to build. Hansen's narrowed eyes held a definite core of worry and even the usually imperturbable Rawlings was rubbing a bristly blue chin with a hand the size and shape of a shovel. In the deep silence after Swanson had finished speaking the scraping noise sounded unusually loud, then was lost in the noise of water flooding into the tanks.

We stared at the screen. Water continued to pour into the tanks until we could see a gap appear between the top of the sail and the ice. The pumps started up, slowly, to control the speed of descent. On the screen, the cone of light thrown on

to the underside of the ice by the flood-lamp grew fainter and larger as we dropped, then remained stationary, neither moving nor growing in size. We had stopped.

'Now,' said Swanson. 'Before that current gets us again.'

There came the hissing roar of compressed air under high pressure entering the ballast tanks. The *Dolphin* started to move sluggishly upwards while we watched the cone of light on the ice slowly narrow and brighten.

'More air,' Swanson said.

We were rising faster now, closing the gap to the ice all too quickly for my liking. Fifteen feet, twelve feet, ten feet.

'More air,' Swanson said.

I braced myself, one hand on the plot, the other on an overhead grab bar. On the screen, the ice was rushing down to meet us. Suddenly the picture quivered and danced, the *Dolphin* shuddered, jarred and echoed hollowly along its length, more lights went out, the picture came back on the screen, the sail was still lodged below the ice, then the *Dolphin* trembled and lurched and the deck pressed against our feet like an ascending elevator. The sail on the TV vanished, nothing but opaque white taking its place. The diving officer, his voice high with strain that had not yet found relief, called out. 'Forty feet, forty feet.' We had broken through.

'There you are now,' Swanson said mildly. 'All it needed was a little perseverance.' I looked at the short plump figure, the round good-humoured face, and wondered for the hundredth time why

the nerveless iron men of this world so very seldom look the part.

I let my pride have a holiday. I took my handkerchief from my pocket, wiped my face and said to Swanson: 'Does this sort of thing go on all the time?'

'Fortunately, perhaps, no.' He smiled. He turned to the diving officer. 'We've got our foothold on this rock. Let's make sure we have a good belay.'

For a few seconds more compressed air was bled into the tanks, then the diving officer said: 'No chance of her dropping down now, Captain.'

'Up periscope.'

Again the long gleaming silver tube hissed up from its well. Swanson didn't even bother folding down the hinged handles. He peered briefly into the eyepiece, then straightened.

'Down periscope.'

'Pretty cold up top?' Hansen asked.

Swanson nodded. 'Water on the lens must have frozen solid as soon as it hit that air. Can't see a thing.' He turned to the diving officer. 'Steady at forty?'

'Guaranteed. And all the buoyancy we'll ever want.'

'Fair enough.' Swanson looked at the quartermaster who was shrugging his way into a heavy sheepskin coat. 'A little fresh air, Ellis, don't you think?'

'Right away, sir.' Ellis buttoned his coat and added: 'Might take some time.'

'I don't think so,' Swanson said. 'You may find the bridge and

hatchways jammed with broken ice but I doubt it. My guess is that that ice is so thick that it will have fractured into very large sections and fallen outside clear of the bridge.'

I felt my ears pop with the sudden pressure change as the hatch swung up and open and snapped back against its standing latch. Another more distant sound as the second hatch-cover locked open and then we heard Ellis on the voice-tube.

'All clear up top.'

'Raise the antennae,' Swanson said. 'John, have them start transmitting and keep transmitting until their fingers fall off. Here we are and here we stay – until we raise Drift Ice Station Zebra.'

'If there's anyone left alive there,' I said.

'There's that, of course,' Swanson said. He couldn't look at me. 'There's always that.'

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