

We are pleased to acknowledge Arthur C. Clarke and HarperCollins Publishers for their permission to use selections from Arthur C. Clarke's novel, "3001: The Final Odyssey," in this training program. Those of you who are science fiction fans - and even those who are not - may remember that Hal, the talking (and thinking) computer, was introduced in the first novel of this series, "2001: A Space Odyssey." Later, you can read about Hal in an excerpt from the earlier novel, which you will find listed with other supplemental training texts.

Although our speech recognition products do not give your computer Hal-like powers, they do offer a more natural way for you to interact with the computer. To help you begin this cooperative effort, we present for your reading pleasure several chapters from "3001: The Final Odyssey."

If, after reading the following chapters, you want to find out what happens, you can purchase the book (published by HarperCollins Publishers) at your local bookshop.

"3001: The Final Odyssey," (c) Copyright 1997 by Arthur C. Clarke

Comet Cowboy

Captain Dimitri Chandler [M2973.04.21/93.106//Mars//Space-Acad3005// \*//] - or 'Dim' to his very best friends - was understandably annoyed. The message from Earth had taken six hours to reach the spacetug Goliath, here beyond the orbit of Neptune; if it had arrived ten minutes later he could have answered 'Sorry - can't leave now - we've just started to deploy the sun-screen.'

The excuse would have been perfectly valid: wrapping a comet's core in a sheet of reflective film only a few molecules thick, but kilometres on a side, was not the sort of job you could abandon while it was half-completed.

Still, it would be a good idea to obey this ridiculous request: he was already in disfavour sunwards, through no fault of his own. Collecting ice from the rings of Saturn, and nudging it towards Venus and Mercury, where it was really needed, had started back in the 2700's - three centuries ago. Captain Chandler had never been able to see any real difference in the 'before and after' images the Solar Conservers were always producing, to support their accusations of celestial vandalism.

But the general public, still sensitive to the ecological disasters of previous centuries, had thought otherwise, and the 'Hands off Saturn!' vote had passed by a substantial majority. As a result, Chandler was no longer a Ring Rustler, but a Comet Cowboy.

So here he was at an appreciable fraction of the distance to Alpha Centauri, rounding up stragglers from the Kuiper Belt. There was certainly enough ice out here to cover Mercury and Venus with oceans kilometres deep, but it might take centuries to extinguish their hell-fires and make them suitable for life.

The Solar Conservers, of course, were still protesting against this, though no longer with so much enthusiasm. The millions dead from the tsunami caused by the Pacific asteroid in 2304 - how ironic that a land impact would have done much less damage! - had reminded all future generations that the human race had too many eggs in one fragile basket.

Well, Chandler told himself, it would be fifty years before this particular package reached its destination, so a delay of a week would hardly make much difference.

But all the calculations about rotation, centre of mass, and thrust vectors would have to be redone, and radioed back to Mars for checking. It was a good idea to do your sums carefully, before nudging billions of tons of ice along an orbit that might take it within hailing distance of Earth.

As they had done so many times before, Captain Chandler's eyes strayed towards the ancient photograph above his desk. It showed a three-masted steamship, dwarfed by the iceberg that was looming above it - as, indeed, Goliath was dwarfed at this very moment.

How incredible, he had often thought, that only one long lifetime spanned the gulf between this primitive Discovery and the ship that had carried the same name to Jupiter!

And what would those Antarctic explorers of a thousand years ago have made of the view from his bridge? They would certainly have been disoriented, for the wall of ice beside which Goliath was floating stretched both upwards and downwards as far as the eye could see. And it was strange-looking ice, wholly lacking the immaculate whites and blues of the frozen Polar seas.

In fact, it looked dirty - as indeed it was. For only some ninety percent was waterice: the rest was a witch's brew of carbon and sulphur compounds, most of them stable only at temperatures not far above absolute zero. Thawing them out could produce unpleasant surprises: as one astrochemist had famously remarked: 'Comets have bad breath'.

'Skipper to all personnel,' Chandler announced. 'There's been a slight change of programme. We've been asked to delay operations to investigate a target that Spaceguard radar has picked up.'

'Any details?' somebody asked, when the chorus of groans over the ship's intercom had died away.

'Not many, but I gather it's another Millennium Committee project they've forgotten to cancel.'

More groans: everyone had become heartily sick of all the events planned to celebrate the end of the 2000's. There had been a general sigh of relief when 1 January 3001 had passed uneventfully, and the human race could resume its normal activities.

'Anyway, it will probably be another false alarm, like the last one. We'll get back to work just as quickly as we can. Skipper out.'

This was the third wild-goose chase, Chandler thought morosely, he'd been involved with during his career. Despite centuries of exploration, the Solar System could still produce surprises, and presumably Spaceguard had a good reason for its request. He only hoped that some imaginative idiot hadn't once again sighted the fabled Golden Asteroid.

If it did exist - which Chandler did not for a moment believe - it would be no more than a mineralogical curiosity: it would be of far less real value than the ice he was nudging sunward, to bring life to barren worlds.

There was one possibility, however, which he did take quite seriously. Already, the human race had scattered its robot probes through a volume of space a hundred light-years across - and the Tycho Monolith was sufficient reminder that much older civilizations had engaged in similar activities. There might well be other alien artefacts in the Solar System, or in transit through it.

Captain Chandler suspected that Spaceguard had something like this in mind: otherwise it would hardly have diverted a Class 1 spacetug to go chasing after an unidentified radar blip.

Five hours later, the questing Goliath detected the echo at extreme range; even allowing for the distance, it seemed disappointingly small. However, as it grew clearer and stronger, it began to give the signature of a metallic object, perhaps a couple of metres long.

It was travelling on an orbit heading out of the Solar System, so was almost certainly, Chandler decided, one of the myriad pieces of space-junk that Mankind had tossed towards the stars during the last millennium - and which might one day provide the only evidence that the human race had ever existed.

Then it came close enough for visual inspection, and Captain Chandler realized, with awed astonishment, that some patient historian was still checking the earliest records of the Space Age. What a pity that the computers had given him the answer, just a few years too late for the Millennium celebrations!

'Goliath here,' Chandler radioed Earthwards, his voice tinged with pride as well as solemnity. 'We're bringing aboard a thousand-year-old astronaut. And I can guess who it is.'

Awakening

Frank Poole awoke, but he did not remember. He was not even sure of his name.

Obviously, he was in a hospital room: even though his eyes were still closed, the most primitive, and evocative, of his senses told him that. Each breath brought the faint and not unpleasant tang of antiseptics in the air, and it triggered a memory of the time when - of course! - as a reckless teenager he had broken a rib in the Arizona Hang-gliding Championship.

Now it was all beginning to come back. I'm Deputy Commander Frank Poole, Executive Officer, USSS Discovery, on a Top Secret mission to Jupiter -

It seemed as if an icy hand had gripped his heart. He remembered, in slow-motion playback, that runaway space-pod jetting towards him, metal claws outstretched. Then the silent impact - and the not-so-silent hiss of air rushing out of his suit. After that - one last memory, of spinning helplessly in space, trying in vain to reconnect his broken air-hose.

Well, whatever mysterious accident had happened to the space-pod controls, he was safe now. Presumably Dave had made a quick EVA and rescued him before lack of oxygen could do permanent brain damage.

'Good old Dave!' he told himself. 'I must thank - just a moment! - I'm obviously not aboard Discovery now - surely I haven't been unconscious long enough to be taken back to Earth!'

His confused train of thought was abruptly broken by the arrival of a Matron and two nurses, wearing the immemorial uniform of their profession. They seemed a little surprised: Poole wondered if he had awakened ahead of schedule, and the idea gave him a childish feeling of satisfaction.

'Hello!' he said, after several attempts; his vocal cords appeared to be very rusty. 'How am I doing?'

Matron smiled back at him and gave an obvious 'Don't try to talk' command by putting a finger to her lips.

Then the two nurses fussed swiftly over him with practised skill, checking pulse, temperature, reflexes. When one of them lifted his right arm and let it drop again, Poole noticed something peculiar. It fell slowly, and did not seem to weigh as much as normal. Nor, for that matter, did his body, when he attempted to move.

'So I must be on a planet,' he thought. 'Or a space-station with artificial gravity. Certainly not Earth - I don't weigh enough.'

He was about to ask the obvious question when Matron pressed something against the side of his neck; he felt a slight tingling sensation, and sank back into a dreamless sleep. Just before he became unconscious, he had time for one more puzzled thought.

'How odd - they never spoke a single word all the time they were with me.'

#### Rehabilitation

When he woke again, and found Matron and nurses standing round his bed, Poole felt strong enough to assert himself.

'Where am I? Surely you can tell me that!'

The three women exchanged glances, obviously uncertain what to do next. Then Matron answered, enunciating her words very slowly and carefully: 'Everything is fine, Mr. Poole. Professor Anderson will be here in a minute...He will explain.'

Explain what? thought Poole with some exasperation. But at least she speaks English, even though I can't place her accent...

Anderson must have been already on his way, for the door opened moments later - to give Poole a momentary glimpse of a small crowd of inquisitive onlookers peering in at him. He began to feel like a new exhibit at a zoo.

Professor Anderson was a small, dapper man whose features seemed to have combined key aspects of several races - Chinese, Polynesian, Nordic - in a thoroughly confusing fashion. He greeted Poole by holding up his right palm, then did an obvious double-take and shook hands, with such a curious hesitation that he might have been rehearsing some quite unfamiliar gesture.

'Glad to see you're looking so well, Mr. Poole...We'll have you up in no time.'

Again that odd accent and slow delivery - but the confident bedside manner was that of all doctors, in all places and all ages.

'I'm glad to hear it. Now perhaps you can answer a few questions...'

'Of course, of course. But just a minute.'

Anderson spoke so rapidly and quietly to the Matron that Poole could catch only a few words, several of which were wholly unfamiliar to him. Then the Matron nodded at one of the nurses, who opened a wall-cupboard and produced a slim metal band, which she proceeded to wrap around Poole's head.

'What's that for?' he asked - being one of those difficult patients, so annoying to doctors, who always want to know just what's happening to them. 'EEG readout?'

Professor, Matron and nurses looked equally baffled. Then a slow smile spread across Anderson's face.

'Oh - electro ... enceph ... alo ... gram,' he said slowly, as if dredging the word up from the depth of memory.

'You're quite right. We just want to monitor your brain functions.' My brain would function perfectly well if you'd let me use it, Poole grumbled silently. But at least we seem to be getting somewhere - finally.

'Mr. Poole,' said Anderson, still speaking in that curious stilted voice, as if venturing in a foreign language, 'you know, of course, that you were - disabled - in a serious accident, while you were working outside Discovery.'

Poole nodded agreement.

'I'm beginning to suspect,' he said dryly, 'that "disabled" is a slight understatement.'

Anderson relaxed visibly, and a slow smile spread across his face.

'You're quite correct. Tell me what you think happened.'

'Well, the best case scenario is that, after I became unconscious, Dave Bowman rescued me and brought me back to the ship. How is Dave? No one will tell me anything!'

'All in due course...and the worst case?'

It seemed to Frank Poole that a chill wind was blowing gently on the back of his neck. The suspicion that had been slowly forming in his mind began to solidify.

'That I died, but was brought back here - wherever "here" is - and you've been able to revive me. Thank you...'

'Quite correct. And you're back on Earth. Well, very near it.'

What did he mean by 'very near it'? There was certainly a gravity field here - so he was probably inside the slowly turning wheel of an orbiting space-station. No matter: there was something much more important to think about.

Poole did some quick mental calculations. If Dave had put him in the hibernaculum, revived the rest of the crew, and completed the mission to Jupiter - why, he could have been 'dead' for as much as five years!

'Just what date is it?' he asked, as calmly as possible.

Professor and Matron exchanged glances. Again Poole felt that cold wind on his neck.

'I must tell you, Mr. Poole, that Bowman did not rescue you. He believed - and we cannot blame him - that you were irrevocably dead. Also, he was facing a desperately serious crisis that threatened his own survival...'

'So you drifted on into space, passed through the Jupiter system, and headed out towards the stars. Fortunately, you were so far below freezing point that there was no metabolism - but it's a near-miracle that you were ever found at all. You are one of the luckiest men alive. No - ever to have lived!'

Am I? Poole asked himself bleakly. Five years, indeed! It could be a century - or even more.

'Let me have it,' he demanded.

Professor and Matron seemed to be consulting an invisible monitor: when they looked at each other and nodded agreement, Poole guessed

that they were all plugged into the hospital information circuit, linked to the headband he was wearing.

'Frank,' said Professor Anderson, making a smooth switch to the role of long-time family physician, 'this will be a great shock to you, but you're capable of accepting it - and the sooner you know, the better.'

'We're near the beginning of the Third Millennium. Believe me - you left Earth almost a thousand years ago.'

'I believe you,' Poole answered calmly. Then, to his great annoyance, the room started to spin around him, and he knew nothing more.

When he regained consciousness, he found that he was no longer in a bleak hospital room but in a luxurious suite with attractive - and steadily changing - images on the walls. Some of these were famous and familiar paintings, others showed land- and sea-scapes that might have been from his own time. There was nothing alien or upsetting: that, he guessed, would come later.

His present surroundings had obviously been carefully programmed: he wondered if there was the equivalent of a television screen somewhere (how many channels would the Third Millennium have?) but could see no sign of any controls near his bed. There was so much he would have to learn in this new world: he was a savage who had suddenly encountered civilization.

But first, he must regain his strength - and learn the language; not even the advent of sound recording, already more than a century old when Poole was born, had prevented major changes in grammar and pronunciation. And there were thousands of new words, mostly from science and technology, though often he was able to make a shrewd guess at their meaning.

More frustrating, however, were the myriad of famous and infamous personal names that had accumulated over the millennium, and which meant nothing to him. For weeks, until he had built up a data bank, most of his conversations had to be interrupted with potted biographies.

As Poole's strength increased, so did the number of his visitors, though always under Professor Anderson's watchful eye. They included medical specialists, scholars of several disciplines, and - of the greatest interest to him - spacecraft commanders.

There was little that he could tell the doctors and historians that was not recorded somewhere in Mankind's gigantic databanks, but he was often able to give them research shortcuts and new insights about the events of his own time.

Though they all treated him with the utmost respect and listened patiently as he tried to answer their questions, they seemed reluctant to answer his.

Poole began to feel that he was being over-protected from culture shock, and half-seriously wondered how he could escape from his suite. On the few occasions he was alone, he was not surprised to discover that the door was locked.

Then the arrival of Doctor Indra Wallace changed everything. Despite her name, her chief racial component appeared to be Japanese, and there were times when with just a little imagination Poole could picture her as a rather mature Geisha Girl. It was hardly an appropriate image for a distinguished historian, holding a Virtual Chair at a university still boasting real ivy.

She was the first visitor with a fluent command of Poole's own English, so he was delighted to meet her.

'Mr. Poole,' she began, in a very business-like voice, 'I've been appointed your official guide and - let's say - mentor. My qualifications - I've specialized in your period - my thesis was "The Collapse of the Nation-State, 2000-50". I believe we can help each other in many ways.'

'I'm sure we can. First I'd like you to get me out of here, so I can see a little of your world.'

'Exactly what we intend to do. But first we must give you an Ident. Until then you'll be - what was the term? a non-person. It would be almost impossible for you to go anywhere, or get anything done. No

input device would recognize your existence.'

'Just what I expected,' Poole answered, with a wry smile. 'It was starting to get that way in my own time - and many people hated the idea.'

'Some still do. They go off and live in the wilderness - there's a lot more on Earth than there was in your century! But they always take their compaks with them, so they can call for help as soon as they get into trouble. The median time is about five days.'

'Sorry to hear that. The human race has obviously deteriorated.' He was cautiously testing her, trying to find the limits of her tolerance and to map out her personality. It was obvious that they were going to spend much time together, and that he would have to depend upon her in hundreds of ways. Yet he was still not sure if he would even like her: perhaps she regarded him merely as a fascinating museum exhibit.

Rather to Poole's surprise, she agreed with his criticism.

'That may be true - in some respects. Perhaps we're physically weaker, but we're healthier and better adjusted than most humans who have ever lived. The Noble Savage was always a myth.'

She walked over to a small rectangular plate, set at eye-level in the door. It was about the size of one of the countless magazines that had proliferated in the far-off Age of Print, and Poole had noticed that every room seemed to have at least one.

Usually they were blank, but sometimes they contained lines of slowly scrolling text, completely meaningless to Poole even when most of the words were familiar.

Once a plate in his suite had emitted urgent beepings, which he had ignored on the assumption that someone else would deal with the problem, whatever it was. Fortunately the noise stopped as abruptly as it had started.

Dr. Wallace laid the palm of her hand upon the plate, then removed it after a few seconds. She glanced at Poole, and said smilingly: 'Come and look at this.'

The inscription that had suddenly appeared made a good deal of sense, when he read it slowly:- WALLACE, INDRA  
[F2970.03.11:31.885//HIST.OXFORD//\*//]

'I suppose it means Female, date of birth 11 March 2970 - and that you're associated with the Department of History at Oxford. And I guess that 31.885 is a personal identification number. Correct? And the slashes at the end?'

'Excellent, Mr. Poole. I've seen some of your e-mail addresses and credit card numbers - hideous strings of alpha-numeric gibberish that no one could possibly remember! But we all know our date of birth, and not more than 99,999 other people will share it. So a five-figure number is all you'll ever need...and even if you forget that, it doesn't really matter. As you see, it's a part of you.'

'Implant?'

'Yes - nanochip at birth, one in each palm for redundancy. You won't even feel yours when it goes in. But you've given us a small problem...'

'What's that?'

'The readers you'll meet most of the time are too simple-minded to believe your date of birth. So, with your permission, we've moved it up a thousand years.'

'Permission granted. And the rest of the Ident?'

'Optional. You can leave it empty, give your current interests and location - or use it for personal messages, global or targeted.' Some things, Poole was quite sure, would not have changed over the centuries. A high proportion of those 'targeted' messages would be very personal indeed.

He wondered if there were still self- or state-appointed censors in this day and age - and if their efforts at improving other people's morals had been more successful than in his own time.

He would have to ask Dr. Wallace about that, when he got to know her better.

This concludes the excerpts from Arthur C. Clarke's novel, "3001: The Final Odyssey." If you would like to read the book, published by HarperCollins Publishers, you can purchase it at your local bookstore.