

AN ODYSSEY OF SORTS

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The turn of the century depicted by Arthur C. Clarke in *2001: A Space Odyssey* is considerably more glamorous than the one we're likely to witness in three years, at least as far as space exploration is concerned. Yet through the gloomy decades since his famous 1968 screen collaboration with Stanley Kubrick, the cantankerous, idiosyncratic Clarke has remained as optimistic, and industrious, as ever. Last year, even as the *Galileo* probe was sending back its startling images of Jupiter's moons, he was busy at work on *3001: The Final Odyssey*, which was published in March. Recently the 80-year-old Clarke took time out of his hectic schedule to talk with Discover's Fred Gutierl by telephone from his home in Sri Lanka. Here are some of the highlights of their conversation.

I'd like to talk to you about your ideas concerning space travel.

I've written dozens of books on the subject and I'm sick and tired of talking about it. I've got nothing new to add, except I think more and more that the new space age, and the new everything age, is linked more and more to the new energy revolution.

What energy revolution is that?

For one thing, there is this so-called cold fusion. Which is neither cold nor fusion. Very few Americans seem to know what is happening, which is incredible. It's all over the world, except the United States. There are hundreds of laboratories doing it, they've got patents all over the place. The prototypes are on sale now. There are 7,000 units operating in Russia right now and no one in the United States seems to know about it.

What will this mean for space exploration?

One of the by-products may be propulsion. That's why I'm no longer interested in rockets or reusable spacecraft-the X-33 and all that. The rocket will do for space just what the balloon did for flight.

Which is not much.

Well, it started it. Unfortunately, in many cases we're damned sure it's not Fusion anyway, just that it's cold.

If it's not fusion, what is it?

That's what's scary.

The year 2001 is almost upon us, and manned Jupiter missions are still far-fetched. That doesn't bother Arthur C. Clarke. He sees better things right around the corner.

There's also some suggestion that if you go and muck around with the structure of space, you may get a space drive. Julian Schwinger, the Nobel Laureate, has a theory that we're actually beginning to tap the quantum fluctuations.

We're being attacked by them?

We're beginning to *tap* them. [Laughter.] Now you've given me an idea for my next story.

You mean the "zero-point energy" that some scientists believe comes from empty space?

Exactly.

So if one or both of these theories are correct, how soon will we see an impact on the space program?

It will obviously take a long time, anyway. Because there are so many vested interests. There are the hot-fusion boys. All the rocket engineers will be out of jobs, and a lot of the poor guys are already. I don't like to guess at a scenario, but I would say that before the end of this decade, the hand waving will be over and people will accept that this energy exists, whatever it is, and there may actually be several different varieties. A lot of heads will roll at the U.S. Department of Energy and elsewhere.

What still needs to be done?

The first thing we have to do is make sure [these new forms of energy] are for real, and figure out how they can be handled or controlled. And then explore the most promising lines of research. One of the most speculative is certainly -- what do you call it? -- gravity control. Have you heard that story from Finland? Is that a fraud, or what?

You mean the Finnish researchers who reported a lessening of gravity in the vicinity of a spinning cube of superconducting material? Do you think it's a hoax?

Well, I don't know. It was a very feeble effect, but the first nuclear reactions were feeble. If it's true, though, it would open up the solar system just as the airplane opened up the planet.

Over the years you've predicted many things that have come to pass, such as geostationary satellites. Is there anything else that you think has a good chance of making the jump from science fiction to fact?

Did you see the December 16 issue of *Time* magazine? I was in the Winners & Losers column shortly after the *Clementine* report about lunar ice. I predicted the lunar ice in one of my books. Actually, I very seldom

predict, but I extrapolate, and there are many things I extrapolate that I would hate to be accurate predictions.

I was surprised to find after I had written the book *3001* that MIT had already invented the handshaking device [which exchanges information automatically when two people shake hands].

What do you think such a device will be used for?

I think the most common application will be, your place or mine?

Anything else?

Another thing I'm keen on is the space elevator.

Which would ride on a cable suspended from a satellite in geosynchronous orbit. How would the satellite support all that weight?

Well, that's the whole point. There's a counterweight beyond the stationary orbit, you see. Imagine Earth is like a sling, it has a long cable with a weight at the far end, and it just revolves, and if the cable is long enough, the weight at the far end will keep it taut.

So all you need is a cable that has enough tensile strength.

Until Richard Smalley at Rice University discovered how to make nanotubes out of carbon 60, the buckyball molecule, we didn't have anything. Now we've got it. We can't start building it yet, because we can't make C60 nanotubes except in laboratory quantities, but someday we will. When we do, do you know what the cost of taking a human being to stationary orbit will be?

Uh, much less than it is now?

A one-way trip, about a hundred dollars. A two-way trip, only ten dollars because you get 90 percent of the energy back on the return journey.

What about the Mars rocks? Do you think they really show evidence of life on Mars?

Well, I'm excited, of course, but I wouldn't put more than, oh, 80 cents to the dollar on it. Obviously we should follow it up.

You must have been excited about Galileo's images of Europa?

Oh my God, yes. But I'm still waiting for the close-ups, which are due out soon. So far, there's been nothing conclusive. Nothing really new yet.

Are you optimistic that we'll get a subsurface probe down there?

I think we'll do everything eventually, but I don't think it'll be for a couple of decades.

What do you think should be our main priority in the solar system?

Mars.

Do you think Bob Zubrin's got the right plan for getting us there!

I've heard some devastating criticisms about his ideas -- that it's the wrong program for the wrong reason. Too many things would have to work perfectly, but that may not be fair. In any case, I don't think we're going to go that way anyhow, so I'm not interested.

I'm running out of steam here.

Can we continue over E-mail?

I get too much E-mail. I've just hired my eighth secretary just to handle my E-mail.