

**Robert
Burnham
Jr.'s 1983
Testament:
An
Astronomer-
Recluse**

Inscribes His Universe (Part II)

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Burnham in his Prescott, Arizona home lab, circa 1960.

Yesterday, we published the first half of a 24,000-word “self-interview” by Lowell Observatory astronomer Robert Burnham, Jr. on what would have been his 80th birthday.

Burnham died in 1993 at the age of 61. He was known not only for his work at Lowell, but for authoring an incredible 2,000-page, 3-volume observer’s guide to the night sky that is, to this day, popular with telescope users. But Burnham wrote almost no other published work and was something of a recluse. In 1982 he published a lengthy self-interview in *Astronomy magazine*. *This version of that essay, almost four times longer, was found in his papers after his death. It has never been published anywhere before this.*

And now, on to the second half of Burnham’s entertaining testament — Tony Ortega, Editor, The Village Voice

Your *Handbook* demonstrates that philosophy very clearly, I think. A number of readers have commented on the amount of space you devote to ancient mythology, Chinese poetry, oriental folklore, Roman coins — things like that. If you had omitted all this, do you think you might have reduced the book to a more practical size?

Not by very much. None of this adds that much to the page count. And I think it gives the work a certain sort of unique personality.

I would agree with that. Do you think the book will remain a unique achievement?

There is no real reason why it should be. There are a fair number of people around who are capable of producing such a thing. A few of them have actually tried. . .

What happened?

Well, the majority of these good folk have long since succumbed to the effects of cumulative concussion after several decades spent beating their heads against a solid wall of apathy. The few survivors have gone on to more rewarding things, like fringe-cult pseudo-science or astrology.

You had those two sentences all ready and waiting, didn’t you?

(Laughing) Yes, I’m afraid so. You know, after hearing the same questions so many times you begin to have word-perfect answers prepared. In the last couple of decades I’ve been interrogated and catechized by everyone from kindergarten school groups to U.S. presidential candidate Barry Goldwater.

That was after your first comet discovery, I understand.

Yes. The Senator was quite intrigued to learn that someone with a home-built telescope had beaten the professionals to a “major astronomical discovery,” as he put it. But he was really fascinated by my account of the optical test of my telescope mirror. Here I was, measuring the curve on the mirror to an accuracy of a few hundred-thousandths of an inch, with equipment made from an old tin can and a razor blade.

And what sort of questions did you get from the elementary school groups?

There are two I would get repeatedly. First: Would you like to go to the Moon? Yes, if I was sure I could come back. Second: Have you ever seen a flying saucer?

Bob, I think I'd like to ask you that same question.

I think I have spent about as many hours under the stars as any observer living today. And I have never seen anything remotely resembling the photographs in UFO books and saucer magazines. Orbiting satellites — yes. Rocket launchings from Vandenberg — yes. Skyhook balloons. Meteors. Refueling tankers. High-flying flocks of birds. But nothing that couldn't be rather easily identified as a known object.

So I am extremely skeptical of persons who claim to have UFO experiences repeatedly. And virtually all the contactee stories are quite literally unbelievable. Aside from the fact that there is never the slightest bit of really convincing evidence to study afterwards. Still, I feel that it's unwise to be too dogmatic. There is nothing inherently impossible in the central idea.

Space travelers may occasionally visit the Earth.

Yes. We really don't know how many inhabited worlds there may be. We don't even have the data to make an intelligent guess. So our minds must remain wide open to the possibility. The earth is immensely old. In several billion years it is quite possible that extra-terrestrial visitors have been here, at some time.

So you could accept the Von Daniken hypothesis?

I could accept the central idea, as a *possibility*. But I feel he attempts to do too much with the notion, to explain all sorts of “mysteries” which may not be based upon genuine data at all. Yes, space visitors may have been here. At some time. But is it really necessary to drag in this hypothesis to explain such things as the Great Pyramid, Stonehenge, the ruins of Tiahunaco and Baalbek, or the strange carvings

on a 7th Century tomb in pre-Columbian Mexico? Is it really necessary to interpret every weird wall carving or grotesque clay figurine as an ancient astronaut? None of this seems very convincing to archaeologists. Surely an extra-terrestrial expedition should leave better evidence than some odd carvings on rocks or curious structures of stone.

Something like a radio set in an ancient tomb? Yes, that would prove something, wouldn't it? But what are your views about the whole saucer enigma?

Well, is there a real enigma at all? Are we really dealing with actual physical objects, or are most of these things some sort of illusion or mass hallucination? Saucers appear and disappear like ghosts. They make impossible maneuvers, like instant ninety degree turns. They come in a bewildering variety of shapes and sizes. And there are *far* too many of them. Several thousand a month are being reported, world-wide. The number of sightings reported from the U.S. alone now totals well over a million. Now this gets to be completely unrealistic. I can't believe that space travelers are coming here constantly, by the thousands, and still managing to avoid all the radar defense networks, the satellite tracking stations, and the telescopes of professional astronomers.

You would say that most of them must be misinterpretations of known objects.

A great many must be honest errors. But there is a strong incentive for deliberate hoaxers, since the UFO business has become not only a new space-age religion, but also a booming and profitable industry like astrology.

I gather you don't think much of the growing commercialism of the modern world.

Well, most Americans would staunchly defend something they call the American Way of Life, on the grounds that it has given them the highest standard of living in the world.

Yes.

And if that was the only point to be considered, there wouldn't be much to argue about. But all this has been achieved by looting the entire planet, by using vastly more than our fair share of everything. The Mafia could defend organized crime on much the same basis. A successful gangster can afford a very high standard of living indeed. It is a little odd that only the positive achievements are considered. A high standard of living excuses everything. What about the other side of the picture? What have we lost in the process? And where is all this taking us?

Ecologists have given us some answers.

Yes, but they are answers which our political and industrial leaders find unacceptable. Politicians are committed to preserving the status quo. The western way of doing things is somehow sacred and must not be questioned.

Don't rock the boat?

Yes. Even when the boat starts to sink. Ecologists have been telling us for years that Uncle Sam is seriously ill, but he refuses to make any real changes in his life style. A few band-aids here and there, perhaps...

You blame the politicians?

Not entirely. They're ordinary humans, stuck in the same tar barrel as the rest of us. Would you like to hear an Irish joke at this point?

Ah sure, and why not?

'Tis said that when auld St. Patrick drove the snakes out of Ireland, most of them emigrated to America and went into politics.

Ah, a sorry view of politicians you have there.

The average politician would not recognize a new idea if one leaped out and bit him in the leg. The loftiest pronouncement you ever hear from one of these thinkers is that we must return to the noble traditions which have made us great — in other words, all the obsolete things that have always failed so miserably in the past. These good folk seem stuck with the odd idea that once upon a time, say about the year 1904, we had a social and economic system that really worked, and all this was eventually spoiled by fuzzy-minded liberals, left wing sympathizers, and New-Deal democrats. A curious misinterpretation of history, I would say. I really don't see the age of the robber-barons as quite that admirable. And this isn't 1904, anyway. Though we still have the best politicians that money can buy, as Will Rogers said. No, obviously, if anything we had tried before had really worked, we would not be in the mess we are in now. Yes, of course, everything works, *for a while*. Until the difficulties start to pile up. I would argue that there is nothing we can go back to.

Secretary Watt said in one of his speeches that Americans everywhere are going back to the fundamentals.

Yes, but the one major fundamental of all he didn't mention. We are stuck with an economic system which requires constant growth to survive. Unless it expands constantly the whole thing starts to fall apart. So we have a set-up which is

basically impossible. You simply can't have a system which maintains itself by endless growth, development and expansion, and constantly increasing the exploitation of everything. That point is beyond argument. Such a set-up is already doomed.

Most Americans would say it's served us pretty well, at least up to now.

That's like claiming you're immortal because you're alive now. The Earth is a globe. All resources are limited. There is only so much of everything. You can go only so far before you start altering the natural systems which make life possible on this planet. Endless growth is an absurdity. And the expansion into outer space is not going to solve this problem, despite the wistful dreams of the high-tech people. There is no technological solution to a problem which results from a basically impossible set-up.

Would you call yourself an environmentalist?

Since I live on this planet, yes. Any human being who expects to survive here must be seriously concerned about a world which grows steadily more poisonous. Anyone today should be able to see the results of a philosophy that "nature" is something to be conquered and beaten into submission.

Many Americans would say you are against progress.

"Progress" is a klunk-word. Like "efficiency." It means nothing by itself. Progress toward what? Toward making the whole world look like Los Angeles? Efficiency in doing stupid things? I am all for genuine progress, for anything that genuinely benefits humanity. I would say that all the real pleasures of life are quite simple. A tremendous amount of slick gadgetry does not add that much to the joy of being alive in an incredibly fascinating world. Often it does just the opposite. Are we really better off with neon signs, smog, traffic jams, nuclear bombs, transistor radios, billboards, and TV commercials? I would be much happier without any of these things.

What have you got against transistor radios?

The tone is simply atrocious. It's a crime to teach children that music really sounds like that.

But they sell.

Yes, they sell.

Aren't you ignoring the very real benefits that technological progress has given us?

Not at all. The advances in science and medicine and electronics and space studies are simply astonishing. I would be the last one to deny their benefits to humanity. But there is an enormous price to pay, IF we allow high technology to be our master rather than our servant. "Progress" doesn't mean much if we keep using our god-like powers to create a whole swarm of new problems that didn't even exist forty years ago.

But you can't blame the technologists for all this.

No, I don't mean to imply that. We have a very peculiar situation. Let me put it this way: We are living in an age when scientists and technologists are forging ahead ruthlessly with dazzling speed, while all the politicians, social philosophers, theologians, and economists are stumbling along miles back somewhere in the rear. All these colossal powers are being turned over to intellectual pygmies. And the modern world in all its absurdities is the result. We're a bunch of idiot children playing with dynamite.

Still, you wouldn't want to go back to the cave, would you?

That's really a very irritating criticism. Especially since I've heard it about a thousand times. No, I don't want to go back to the cave. Is it really logical to argue that we must let technology run wild and uncontrolled or else we will all be heading back to the cave? A nuclear war may be the thing that will ultimately send us back to the cave. Surely we can all agree that technological developments should be used carefully and wisely for the benefit of mankind? Can't we agree that we should think very carefully about the possible effects of what we are planning to do?

Industrial leaders say that it takes too long to make such studies. We have to keep moving ahead.

Well, that's Big Business talking. That's not science. Keep the juggernaut rolling. Keep moving ahead. Yes. But which way is *ahead*? Are we really benefitting that much from all this constant change, constant expansion, constant development? Is the world really better because everything gets steadily bigger, faster, noisier, dirtier, uncontrollable, and more incomprehensible?

You obviously don't think that technology is going to solve all our problems.

A purely technical problem can be solved by advances in technology. An improvement in aircraft design. Better color TV. An efficient plumbing system. An

efficient political or social system is an entirely different matter. Yes, we have wiped out smallpox. Great. We no longer fear the Black Death. Wonderful. And our space probes are heading out past Saturn. Wow. Prolonged applause. But, at the same time all our human problems are increasing. Crime is going up, mental illness is going up, the probability of nuclear war is going up, the divorce rate is going up, juvenile delinquency is going up, the suicide rate is going up — and not particularly among bewildered older people, which might at least be understandable, but among the *young*. Among the very people who should be our great hope for a brilliant future. Now surely there is something drastically wrong here.

But you admitted that you don't blame runaway technology for most of this.

No, I don't. But I do blame what they call "tunnel vision" — the simplistic notion that some amazing new gimmick from the high-tech lab is going to solve every problem. And I resent being dismissed as an unrealistic dreamer because I don't see technological advances as quite that all-important. That's the old George III syndrome again: "I desire what is good; therefore everyone who does not agree with me is a traitor." Well, George, you are not the ultimate authority on what is "good." The Spanish exploitation of the New World seemed like a pretty good thing to the conquistadores; it didn't seem nearly as good to the American Indian. There is always room for quite a lot of argument about these things.

You're on the side of the Indians.

Well, I'm on the side of the biologists. Human and ethical considerations must come first. Otherwise our pursuit of progress and efficiency is going to give us a civilization resembling Hitler's Germany, where everything runs with admirable smoothness — including the trains carrying rebels to the concentration camps. I agree with René Dubos when he said that many of the imagined future utopias are quite literally impossible, because they would deprive man of all the stimuli that human beings need to remain human. Any advance in technology can be used for good or evil. It depends on who is in control, and how these powers will be used. A computerized society *could* be a blessing (though I doubt it) or it could be a curse.

You can always pull out the plug.

Well no, you can't, because the computer will be in the hands of people who are not going to pull out the plug. They're using that computer to control you, and keep you in line. Yes, that sounds pretty paranoid, I know...

You're implying that the powers of technology will always be misused in a society like ours. That our political and economic system guarantees it?

Yes, I'm saying something like that. Let's consider the economic aspects for just a minute, since this is a major factor in the unwise exploitation of resources. We are becoming an almost totally commercialistic society. Nothing is ever done for its own sake, but only for the fast buck it will bring in. Whatever else the set-up does, it encourages greed, fraud, and deception, not to mention outright crime. We are all being conditioned to think of human life as a business venture which must show a profit. Such a system practically guarantees that all the precious resources of the Earth will be exploited at a furious rate for foolish and trivial purposes. It has also given us a society in which there is almost no correlation between commercial success and real ability, or even real achievement. Success today is synonymous with efficient hucksterism. Fame is the result of efficient promotional campaigns carried out by public relations people. Important writers, composers, and scientists manage to survive somehow on a very modest income, while all the really fabulous rewards go to the promoters of commercial trash.

Don't you think you're exaggerating a little?

Possibly. But it has always seemed to me that the furiously competitive way of life has to be defended by strangely Darwinian arguments. And strangely inappropriate ones as well. If you set millions of people frantically competing against each other, obviously the most intelligent and resourceful will come out on top, right? Survival of the fittest, they call it. Well, in nature it does seem to work something like that. The stronger and more intelligent animals would appear to have a better chance at competing for food, or mates, and then passing their superior qualities down to their offspring. But human economic competition isn't at all like that.

No one has shown that success in business is due to any sort of genetic superiority. There is a fair amount of evidence to indicate that exactly the opposite is true.

You're talking about geniuses who don't make the grade?

Partly. I'm talking about the strange lack of correlation between high performance in school and success later in life. More than one sociologist has called attention to this. Cynics will reply that formal education is being drowned in irrelevancies, that schools have forgotten the first function of education — to offer basic instruction in the arts of living. Well, you can't argue that, I guess. But the schools are at a great disadvantage in a society which doesn't attach much importance to a genuine education...

You're talking about that anti-egghead tradition again.

Yes. The important thing in the modern world is to "get ahead." Which boils down almost exclusively to "making money." So we are all hypnotized by the great ideal

of “making money.” And being turned into a herd of infantilized compulsive consumers in the process, as Theodore Roszak put it. We have a society where everything from erotica to the White House is for sale; where there are no values except commercial values; where everything from bubble gum up to presidential candidates must be packaged, wrapped up, promoted, plugged, advertised, and sold to the public like bars of soap. All the huge rewards go to the wheeler-dealer who finds something lucrative to exploit, and exploits it to the limit. Never mind if it’s something trivial or silly like the pet-rock craze, or pure loony-bin schlock like horoscopes for dogs, or even something clearly harmful, like tobacco. As long as the stuff sells you’re making the money, and you’re a valuable member of society. You’re keeping the economy going.

You wouldn’t mind being a “success” like that, though, would you?

Probably not. But if this is really “survival of the fittest,” the whole concept seems to have been turned upside-down. Under such a set-up it is usually the third-rate trash which stands the best chance of surviving. Genuinely worthwhile things stand a good chance of being weeded out. Who wants to promote a significant new symphony when you can make a thousand times more money on something like *Rudolph the Red-Nosed Reindeer*? The entire life income of Beethoven would not pay the royalties on *Mairzy Doats*. By modern commercial standards, such people as Poe and Melville and Van Gogh were total failures. While some current grade B-minus hack-work brings in the money by the ton. Well, the businessman has no choice. He has to produce for the mass market because that’s where the money is. So the rewards offered in our society for something like the *Celestial Handbook* are virtually zilch...

Aha! Now we’re getting personal.

Yes, of course. While some self-proclaimed mystic is making a fortune on a book on astrology for your cat. Or some similar bit of commercial goofiness. This is survival of the fittest?

You’re talking about two different meanings of the concept — the economical and the biological.

All right, then. Let’s get biological. Has anyone shown that the successful businessman is somehow genetically superior to the slum-dwelling “failure?” Suppose this could be convincingly demonstrated. The argument still falls flat on its face, since success in business has nothing to do with success in reproducing the race. Wealthy businessmen do not have more children than other people. Exactly the opposite is true, and always has been. So what evidence can there be for the claim that fierce economic competition is acting to improve mankind?

I don't think anyone can seriously claim that it will improve mankind *genetically*. The usual claim is that it encourages material progress...

And raises the standard of living. Yes, I know. But unless you can actually improve *human beings*, the whole concept of material progress loses most of its meaning. I forget who it was who defined modern progress as "teaching the cannibals to use a fork and spoon." Yes, we have millions of big cars, and TV sets, and rockets to the moon. But are we actually better human beings than the men of Caesar's time, or the Greeks in the days of Socrates?

Most historians would say no.

Then it is a little hard to see what all of this frantic activity is actually accomplishing. It isn't just a question of what all this does to our world. What is it doing to us? Consider just one small facet of the modern world — the TV industry. I am told that the average American child spends four to five hours a day watching the tube. Even if the programs were excellent — which in about 90 percent of the case they are not — I would find this alarming. Children should not be spending their time listening to programmed entertainment, or watching flickering images on a screen. They should be out experiencing the real world. They should be listening to the wind in the trees. They should be out looking at the stars.

You don't have a very high opinion of the entertainment industry.

I don't care for music which is quite capable of causing permanent ear damage. Or stuff that goes *whompety-whomp-whomp, klunk-klunk-wham!* and hits 7.3 on the Richter scale on every third beat. The elderly British gentleman expressed my views perfectly when he was asked to submit a testimonial to a new gramophone company. Gentlemen: I have tested your machine. It adds a new terror to life and makes death a long-felt want...

Don't you think that some of the problems brought on by modern industrial growth may be solved by man's journey into space? Are you a supporter of the space program?

I am a strong supporter of the space program for the purposes of exploration, adventure, and discovery. I am considerably less enthusiastic about the concept of permanent space colonies as a home for the human race. I feel that the space enthusiasts are promising far more than the concept can possibly deliver. Certainly this will be true if we go into space carrying with us a whole culture based on guilt, fear, exploitation and greed.

Don't you think much of this will disappear as man overcomes the limitations of this planet and moves out to infinite horizons?

Well, a great many people seem to think so. Ray Bradbury, for example. He says he would love to come back every hundred years or so and watch us. He's a romantic, of course. My own views are a little more skeptical. The problem, as I see it, is that the horizons are really not that infinite. There may be a fair number of inhabitable worlds in space, though I suspect that truly earth-like planets are going to be much rarer than we think. There is also, obviously, an endless supply of energy and raw material. I don't question that. By any human standards, space is certainly infinite. *So* infinite, in fact, that it is virtually certain that most of it is going to remain forever beyond our reach. If you're dying of thirst in the middle of the Gobi Desert, it doesn't help much to be told that there's plenty of water in Lake Michigan. Yes, I know, this brands me as an old stick-in-the-mud and a planetary chauvinist...

Technologists may find ways to transcend these limitations.

They may. I've had technologists assure me that anything that is not physically impossible is going to be done.

And your reply to that?

I hope we have better sense than that. In any major undertaking, the primary consideration should always be: Will this really benefit mankind greatly, or will it simply create a whole pack of new problems that we could just as well be without?

But you can't always look that far ahead.

No, you can't. That's part of the problem. We are always moving ahead partly in the dark. But technology is not magic. There are definite limitations dictated by the very nature of space and time. The high-tech people are certainly promising great things. We are going to mine the asteroids, we are going to build huge space colonies in Earth orbit, we are going to ship our surplus millions off to Mars or the Moon, we are going to send gigantic space-arcs out to other star systems and colonize the Galaxy...

You sound a little skeptical.

Well, if we are talking about mankind's future thousands of years from now, I would hesitate to make any definite statement about what *may* be possible. If we are talking about the near future, then I would say bluntly that none of these things seem very likely. I don't doubt that we will eventually journey to all the other

planets of the Solar System — or at least to their satellites. But the colonization of other star systems, or even other galaxies, seems to me wildly unrealistic, because of the distances involved. A journey which is going to take centuries or millennia cannot be called exploration or travel in the usual sense. The people who go won't live to reach their destination. The folks back home won't live to hear the results. Even their nations and cultures may not survive that long.

Do you feel the same about interstellar communication?

We may eventually exchange messages with inhabitants of nearby star systems; Tau Ceti, for example, if it has inhabited planets. But anything vastly more remote than that doesn't look very practical. It isn't communication if the answer to your message won't arrive until a few centuries after your entire civilization has become extinct.

Scientists may find ways to transcend these limitations. Space warps or some such concept. They may find ways to extend human life. Or they may develop quick freezing or suspended animation for long journeys.

They may. No one has shown yet that these things are even possible. And until they do, it is pointless to attempt a realistic plan for an interstellar voyage. If the distance factor cannot be conquered then the whole concept remains in the category of fantasy dreams.

Science fiction writers often see their dreams turn into facts.

Yes. But this doesn't mean that *every* dream is going to become a fact. There is still such a thing as the Physical Impossibility. Some of my colleagues keep telling me that "anything is possible." Well, no, that's not quite true. There are some things that simply are *not* possible. You can't fly to the moon by flapping your arms. You can't teach a snake to tap-dance. You know, there is a charming naiveté about some of these wildly optimistic expectations. Right after the Apollo moon landing, I remember hearing one senator — mercifully, I won't give his name — exult that "we are now the masters of the universe. We can go anywhere we choose." Apparently no one ever explained to him that the moon is practically in our backyard, and that the nearest star is a *hundred million times* farther away.

So you don't believe that man will ever achieve the conquest of space?

That phrase is really one of the silliest ever invented. Here are two ants — perched on a leaf in the middle of the Amazon, and after enormous effort and incredible expense they finally manage to get across to the next leaf. So they claim they've "conquered the forest."

I see what you mean. But you're lucky that Columbus didn't feel that way.

Yes, I know. This "Columbus analogy" gets thrown at me constantly. But it really isn't a very apt comparison. Heading out into the unknown Atlantic in 1492 was a pretty bold venture, admittedly. But it didn't require the development of a whole billion-dollar technology. All the equipment needed was already in existence, and no overwhelming expense was involved. From the viewpoint of Spain, the cost was really negligible compared to the possible benefits.

And you don't think that's true of the space program?

Well, no one can say yet. But the costs are so enormous that it's difficult to justify a really major effort — like a giant permanent space-city, or the launching of a space-ark out toward Barnard's Star. We can't even know ahead if there's a suitable planet to land on.

We could, if we picked up their radio transmission.

Yes, but in that case the planet is inhabited already. What do we do then, start a space-war? I really don't care for this *conquistador* analogy. It's the old idea of "manifest destiny" all over again. Only this time it's the whole universe that's going to be conquered and subdued and exploited for our use. Well, I'm not too worried. It's very unlikely that it's ever going to happen. The distance scale seems to impose a definite and permanent quarantine.

You don't think that interstellar travel is possible?

It may be *possible*. If the time-factor doesn't matter. Yes, we can go to Barnard's Star, if you want to spend about 50,000 years making the trip. It's difficult to see what sort of power source could cut down the time significantly.

You haven't done your homework. Don't you read *OMNI*?

(Laughing) Yes, I read *OMNI*. Yes, of course, I constantly see all those marvelous plans for star-craft. Light propulsion systems. Ion-beam powered engines. Matter-annihilation systems. *Anti-matter* annihilation systems. Hypervelocity drives. Space-warp leapers. Magnetic scoops which collect stray atoms in space and then use them as fuel. That one wouldn't work, I'm afraid. You'd lose as much energy as you gain. Well, it's all very entertaining. These things work beautifully in the pages of your comic book. How many of them would actually work in space? Well, if it's a matter of accelerating your craft up to nearly the speed of light, you have a basically insoluble problem. The fuel requirements become impossibly large. No matter what sort of propulsion system you're using, even if it's total conversion of

mass into energy. You find you have to convert a mass the size of North America, or worse. So we'll have to settle for something a little more reasonable. But in that case your journey is going to take centuries, at the very least.

Unless you short-cut by using a space-warp. Or a black hole.

You've been reading *OMNI* too, haven't you? Well, I'll have to let the physics people argue that. So far there isn't even a respectable scientific *theory* to explain how such things could be controlled or used by a spacecraft. And how do you go through a black hole without being squashed down to a microscopic grease spot in the process? Very carefully? Yes, I realize that my skepticism could look very silly in a few decades. I don't doubt that. But I seriously doubt that most of these things, even if they are possible, will be achieved in time to solve our present problems. Technological solutions frequently work the other way around. Each new solution creates six more problems. You have to run faster and faster just to stay in the same place.

I was wondering how you were going to work that in.

Now you know. I would say that our present problems exist there on Earth, and they're going to be faced here on Earth. Space travel isn't really going to offer any sudden, miraculous solutions. The whole question may be largely academic anyway, considering the present atmosphere of ruthless budget-cutting. Ask me again in about a thousand years.

You don't think that commercial exploitation of space resources will ever be practical? Mining the asteroids, for example?

Well, there is a huge gap between what is technically feasible and what is humanly workable. Asteroid mining is technically feasible. But at what cost? My friends at JPL tell me that it could not be done profitably with present techniques even if the asteroid was made of solid gold.

Technological advances will bring the cost down in time.

Yes, I know. That's what the space-boosters tell me. Massive technological breakthroughs will eventually solve all the problems, and the cost will go way, way down. I am skeptical. This happens in a few rare cases, such as hand calculators, where the market is glutted with some product that can be mass produced cheaply in enormous quantities. But I don't see the price of ocean liners going down. Or jet planes. Or even the family car. If the price of anything so simple as a postage stamp keeps going up, up, up, then I doubt very much that the price of ultra-sophisticated technology is going to go down, down, down.

Time may prove you wrong, we hope. What about the idea of adapting other planets to our needs?

What they call terraforming? An interesting idea, but probably far beyond any present capabilities. If we are really going to become that omnipotent, I would like to see a little more evidence of it. There are still huge areas of the Earth which are virtually uninhabited, chiefly because of temperature extremes or lack of water. We have not been able to do much about making the Sahara or Central Australia inhabitable, so I don't see much point in buzzing off to build colonies on the Moon. Central Australia at least has air you can breathe. The Sahara may not have much water, but compared to the Moon it's practically a swamp. The Gobi Desert may not look very attractive, but compared to Mars it's a veritable garden of Eden. So why all this eagerness to whiz off somewhere else? If we haven't been able to colonize much of Nevada so far, then I don't think we're ready to start making over Mars.

But suppose technology eventually *does* reach that point?

All right, let's suppose that. In the next 35 years the population of the Earth will just about double. We terraform Mars and ship all these people — four billion of them — off to the Red Planet. And so there we are. In a mere 35 years Mars is as densely populated as the Earth. What now?

Other planets, I suppose.

Yes, though the idea of terraforming something like Jupiter seems pretty well beyond any reasonable possibilities. Even so, we might gain something like 200 years or so at the most. What then?

Bob, let's consider a simpler concept for just a minute — space colonies right here in the Solar System. Wouldn't such things help to relieve some of the Earth's problems — overpopulation for example?

Well, if you consider just the sheer numbers involved, I would say no. The population of the Earth is growing at a rate of close to 200,000 per day. That's a new city the size of Baltimore or Pittsburgh every eleven or twelve days. You would have to move people into space at that rate just to keep the population at its present level. Several thousand rocket launchings, today, and again tomorrow, and the next day, and the day after that — forever. It becomes completely absurd.

There is no foreseeable type of technology which will ever make such a thing possible. Not to mention the logistics of the situation — the paperwork and organization and red tape involved. And the space colonies themselves would have

to expand their facilities at the same rate as well — forever. Can you imagine what sort of technology could do that; to provide constantly growing facilities for the needs of over a million more people every week?

You make it sound pretty hopeless. But there wouldn't be just one colony; there would be many of them.

Yes, if such an idea is found to be workable at all. I have a sneaking suspicion that a large, permanent space colony may not even be possible, or humanly workable.

Why do you say that?

Well, consider just the simplest problems, the materials and resources needed to keep the thing in operation. Technologists assume that once a large space colony is established, it could support itself by constant recycling of materials, like a balanced aquarium. Yes, of course, the Earth itself works like that. But on a radically different *time-scale*. A highly industrialized society produces mountains of garbage at a vastly greater rate than nature can deal with. A major city like New York or Tokyo produces over thirty million pounds of garbage every day. For Tokyo the actual figure is 40 million pounds per day. About 80,000 square miles of land must be kept under cultivation to feed the population of New York City. This is in addition to the minerals, fuel, and other resources which a major city devours in enormous quantities. No earthly city has solved the problem of supporting itself solely on what it can produce. Or the problem of constant recycling of all this waste. Or even of disposing of it properly. Virtually everything is brought in from somewhere else, and all the trash and garbage is hauled away and dumped somewhere else. In the U.S. today, less than 10 percent of hazardous industrial waste is disposed of properly. The standard practice is still what Jacques Cousteau called the Pilatus Syndrome: "Dump it and wash your hands."

Now, transfer all these problems to a space colony, and what have you got? You would either have to recycle all this material almost immediately, or else shoot it off into space and import an equal quantity each day to keep the whole process going. Neither alternative seems very practical. In fact the whole concept seems weirdly unrealistic. A small colony, for purposes of scientific research, is certainly feasible. But something like Manhattan-in-Space, occupied by several million people, seems to me to be grossly unworkable.

You may be too pessimistic. Suppose technologists *did* solve all the problems?

Well, we can suppose anything. But our experience here on Earth doesn't offer much encouragement. Just last year the city officials of Chicago cheerfully announced that it simply isn't possible to keep Chicago in a state of repair. It isn't a

question of raising the funds, either state or federal or private. The costs of maintaining the city adequately are simply beyond *anybody's* budget. No matter how you try to slice it. It's the old principle of diminishing returns again. The cost of doing something properly not only exceeds the benefits, but appears to be beyond anyone's financial capabilities. I strongly suspect that the "giant space-colony" concept is going to die of the same painful illness.

And you won't be too sorry about that. You don't agree with the futurists who say that man's destiny lies in space; that he will stagnate and degenerate if he remains here in his cradle?

It seems to me he will stagnate and degenerate much more rapidly in a space colony than he will here on Earth. And this "cradle analogy" is really very inappropriate. Yes, of course, no one expects a baby to remain in his cradle. There is a whole wonderful world out there waiting for him. Is there really a whole wonderful world out there waiting for space travelers? This might be true if there were a number of Earth-like planets fairly close to us. But none of the other worlds of the Solar System are inhabitable, not unless we build huge artificial environments in which to live. Yes, of course we could construct colonies on the Moon or Mars. But who wants to spend a lifetime imprisoned under a giant plastic dome on a dead world? Why should the baby want to leave his cradle if everything beyond it is barren, bleak, hostile, and totally unsuited for human habitation?

With a space colony you could create your own environment.

Yes, but a terribly limited one, obviously. Well, some of these things look fairly attractive on paper, I'll admit. The best ones resemble a combination of Disneyland and the cover painting from *Gee-Whiz Planet Stories* for April 1937. But such a thing at best is only a feeble imitation of a real world. It's a highly sophisticated hamster cage. Here's an area labeled "manufacturing and storage," and one labeled "living and working," and another called "recreation." I don't see any region labeled "instant garbage recycling," so I doubt that this particular colony would work. You know, I get a case of the cold mulligrubs when I see one of these things, especially when it comes with the claim that mankind can now abandon the Earth and "progress" on to a totally synthetic environment. Even more irritating is the claim that this, in fact, constitutes an important forward step in human evolution.

Technologists seem quite confident of their ability to construct large Earth-like environments.

Man needs vastly more than an Earth-like environment. He needs a real world. This is what the high-tech people fail to see. A space colony offers one thing — it's a base for scientific research. That's important, but that doesn't mean it could be made into a suitable permanent home for millions of people. Technically minded

people can be amazingly dense on this point. They seem to think that human beings have no real needs other than purely material ones. Here's a scientist who says that man will soon exhaust the possibilities of this world and must move on somewhere else. He is beeping through his space helmet. You couldn't exhaust the possibilities of this world in a thousand lifetimes. An area the size of Arizona or Ireland could keep you busy for generations. You could spend your life at Yosemite and not experience more than a fraction of what it has to offer.

You're speaking again as a naturalist.

I'm speaking as a human being. I feel that the whole concept, whether or not it could be made technically workable, constitutes a giant step backwards. Rather than expand human consciousness it would stultify it. A space colony is not a world; it's a totally artificial construction, a giant building. Yes, of course, you *could* live your life inside the Empire State Building and never go out at all. You can purchase everything you actually *need* right there. But what kind of a *life would that be?*

A space colony could be more attractive than that. It could be realistically landscaped...

Yes, of course, With trees and grass, and even a fake mountain thoughtfully supplied by the Parks and Recreation Department. Well, the problem of traffic jams would be solved, at least. Obviously there would be no need for private autos on a world only a mile or two in diameter. There would also be an end to the dangers of earthquakes, volcanoes, and mosquitoes.

Now you're being more optimistic.

Yes. And in return for this, what are we offered? A fake mini-world designed by technologists who limit much of their thinking to the hardware and the mechanics involved. No one has devoted much time to the most important consideration: what would it be like to live in one of these imitation worlds? Permanently? No real mountains or forests. No real rivers or oceans. No real seasons, clouds, sunsets, spring rains or winter snows. Not even a real cycle of day and night. No Yosemite, no Grand Canyon, no Iguazu Falls. No surf rolling in on the coast, no moonrise over the sea. No peaks to climb or caves to explore or wilderness to experience. A totally man-managed ecology. You can't even look for arrowheads or fossils or ancient ruins, or search for lost treasure. Nowhere to go, and nothing to do but keep the colony running. You would be spending your life in a very efficient, very sophisticated, and immensely expensive motel.

You attach great importance to contact with the natural world.

Yes, I do. I feel that after a few generations of living in a space colony, the inhabitants wouldn't even be human. I feel that a completely artificial world is an impossible concept as a home for millions of people. It might be suitable as a prison for condemned criminals.

Space enthusiasts obviously don't see it that way. What do you reply to the argument that man could be conditioned to accept the new environment, and would therefore be perfectly happy in it?

Arghhh! That's the engineering mentality again. Yes of course man can be conditioned to accept all sorts of absurdities. At the cost of making him less sensitive, less aware, less intelligent. That's progress? I suppose it is, if we're willing to settle for a world full of robots. Samuel Johnson was perfectly happy in London. Or so he claimed: "When a man is tired of London, he is tired of life; for there is in London all that life can afford." I can imagine Thoreau's reply to a statement like that. Apparently it never occurred to the good Doctor to imagine that the wilderness of nature might have anything to offer to man. Whatever London has, it does not have anything like the High Sierras or the great North Woods. London is fine, as long as you're not a prisoner in it. There's quite a bit more to the real world than that.

Do technologists ever give you the argument that whatever exists must be natural, so an artificial environment is just as natural as anything else?

Arghhh again! There are certain people who take a strange pleasure in spouting idiocies because it makes them seem so clever. Every few days I hear some new bit of academic fazz-bazz, such as the claim that trees and cows produce more air pollution than automobiles do. Oh sure. That stuff hanging over Los Angeles is cow-exhaust, I suppose. Yes, I often hear a weird pseudo-argument that goes something like this: Man is a product of nature, therefore anything that man does is natural, therefore an automobile is just as natural as a sequoia tree, therefore breathing smog is just as natural as breathing air, and therefore there's nothing to worry about. Right? Well, this may seem cutely clever, but it's an example of the sort of thinking that rather quickly degenerates into linguistic sophistry. What we have here is a striking case of the "semantic fast shuffle," where a word means one thing going into a sentence and something else coming out...

Where did you get that phrase?

I'll have to give Robert Claiborne credit for that. It's from his essay, "Future Schlock." The trick here is the sudden switch in the meaning of the word "natural." Something may be quite "natural" in a physical or chemical sense, but totally "unnatural" in a biological sense. Turpentine is a "natural" substance, but you can't put it into your aquarium and expect your fish to swim in it. A totally dark, damp

cave may be completely “natural” but you wouldn’t argue that it’s perfectly natural to raise growing children in it. I expect to be told next that since you can build a canoe from the bark of a tree, you should be able to do the same with the bark of a dog. Bark is bark, isn’t it? Well no, it isn’t. And you can’t argue that a plastic tree is just as natural as a real one. In the first place it isn’t really a tree. It’s a fake.

But then much of modern civilization would have to be classed as unnatural.

I’m afraid so. That’s exactly the problem. Despite all our technical progress we don’t seem to be getting much closer to the ideal which should be No. 1: A world fit to live in. Some sociologists think that within the next century, if present trends continue, we will have a world fit only for machines to live in.

You think that the undesirable side-effects often outweigh the benefits.

Obviously they often do. And there’s no such thing as a “side-effect.” Whatever happens is an effect. Here’s some scientist telling us that man will soon conquer old age, and we will all live to be 200 or 300 years old, or even that we will achieve actual immortality. Wonderful. He doesn’t mention the “side-effects” of such a development — that we will soon be standing up to our ears in a solid mass of people. Who can seriously claim that we are ready to face such a “scientific advance” as that, when we can’t even solve the problems of Mexico City? Just what is this sort of progress supposed to accomplish, anyway? Are we doing such things just to support the claim that we are the greatest country in the world?

You don’t think we are the greatest country in the world?

I’m not sure what such a claim means. There are different kinds of greatness; there are different standards of excellence. Who was greater, Beethoven or Newton? Well, it depends on what sort of achievements you’re talking about. In material comforts we are probably somewhere up near the top. But that’s not the only criterion to be considered. At any rate, such a claim makes us look a little silly in the eyes of vastly older cultures such as the Chinese, who have a history going back over 3,000 years. No “great” person goes around constantly bragging about the fact. Such a policy makes us look like boastful adolescents. “It’s a little early to say, isn’t it?” my Chinese friends would reply. “Your society is barely starting to emerge from its childhood. Let us see what you have come to be in about a thousand years.”

OK, we’ll wait for about a thousand years. But you don’t seem to be too optimistic about the future.

If we can get through the next half century without exterminating the human race, then I'll be fairly optimistic about the future after that.

A few years ago one of the editors at OMNI said something about the idea of man traveling among the stars, that it would be the most wondrous, Utopian future he could imagine.

Well, that certainly sounds boldly adventurous and far-seeing. Until you begin to really think about it. It reminds me of Lincoln's story about the man who accompanied his wife to the opera, and as they were taking their seats he said to her: "Interpret for me the libretto, lest I dilate with the wrong emotion." So, how do I interpret this libretto? Would traveling among the stars be truly utopian? Not if it's going to take us centuries to get anywhere. Not if the chances of finding truly Earth-like planets are almost hopeless. Will the time ever come when a voyage to Arcturus will be a quick routine trip like flying to Paris for a week? I really doubt it. Drifting through space for endless ages is not my idea of Utopia.

But that's what we're doing right now.

Yes it is, but we're doing it on a *world* which is big enough to give us just about anything we could want, provided we use it wisely.

You haven't heard the argument that man needs new challenges to inspire him, and new horizons for the explorers of the future? Men like Magellan and Columbus and Drake...

And Dr. Livingstone, I presume. OK, I don't question that. If you really have to climb a mountain because it is *there*, I don't argue about it. But I really doubt that such exploits greatly benefit mankind, or offer the promise of any sort of utopia.

You have a different idea of Utopia.

Well, yes. None of the conventional ideas of Heaven seem very appealing to me either. You'd have to design different utopias for different people.

And what would yours be like?

That's a tricky question, isn't it? Are we talking about what is reasonably possible, or what we would do if we had the powers of gods? Well...I'd want lots of natural beauty, at the very least. Mountains and forest, rivers and waterfalls, plenty of trees and flowers and animals...a really lush green world. Like a Maxfield Parrish painting. Lots of beautiful, thoughtful, good-natured people, people who are simply human in the best sense of the word, people who are kindly and reasonable rather

than high-principled and righteous. People who see life as something to be lived, not a constant rat-race in pursuit of some abstraction, or a furious contest that has to be won at all costs. Reasonable abundance for all. Neither fabulous wealth nor grinding poverty. Economics as if people mattered, someone called it. Production and distribution regulated by human need. Religion based simply on knowledge and reverence, with no complicated theologies. Morality based on genuine love and understanding rather than on guilt, shame, and fear. Lots of leisure time for thought and contemplation. More quiet and serenity. A satisfying world for man here and now. We can't live in the future, anyway.

A sort of lazy man's paradise?

Well...that's really just a little unfair. I don't consider myself lazy. And I have a 2,000 page book in print to prove it. But I think we would all be much happier in a less frantic, less aggressive society. I'd like to see a somewhat *mellower* world. And I do resent having to spend my life doing someone else's work merely to survive. I don't think that human labor should be considered a commodity to be bought and sold on the market. Someone buys my labor only if he can use it for his own profit; otherwise I am considered worthless. That's exploitation, no matter how you try to defend it. People are supposed to be grateful to an employer for giving them a job. Actually it should be the other way around. The employer should be grateful to the people who do the work; *they* are the ones who actually create the wealth. What good would the employer and his money be, if no one could be found to actually do the work?

The money guarantees that somebody *will* be found.

Sure, but that's letting yourself be hypnotized by this identification of money with wealth. "Money" is a way of counting and measuring wealth; it's an abstraction that man has invented. A dollar is not a real thing; it's a unit of measurement like a degree of longitude. To talk about the value of a dollar is like talking about the value of an inch. When a businessman does a "cost-benefit-analysis" he thinks entirely in terms of money; the *other* costs and benefits aren't even considered. You can't measure everything on a money scale. In my ideal world, the immense powers of technology would be used, as much as possible, to free every human being from the necessity of selling himself into part-time slavery merely to avoid starvation. Despite all our talk about "labor-saving devices," one of the major uses of technology is to create new jobs! I don't see much chance of any of this changing significantly without overhauling the whole setup.

And that's probably not going to happen.

Probably not. Not unless we have a total collapse of the whole system. And I doubt anything short of a nuclear war could accomplish that.

Well, they say you can always throw the rascals out.

Not when they'll be immediately replaced by another set of rascals with precisely the same old ideas. It doesn't matter *who's* in office; they all think alike; they're all members of the corporate, managerial office-bound segment of society. All these people constitute — the phrase is Roszak's, I think — the "lead-bottomed ballast of the status quo." It would never occur to any of these people that there might be radically different ways to run things; even the thought would be rejected as "un-American." And the general public isn't much better, unfortunately. We are all victims of the carrot-on-the-stick syndrome. Or should I call it the Hamlet Syndrome? Rather bear those ills we have than fly to others we know not of.

Well, you can understand that. The average American would say he's never had it so good.

Uh, huh. In this century so far we've had two world wars, one major depression and constant minor ones, the Korean crisis, the Cuban crisis, the Vietnam mess, and a permanent Cold War which threatens at any moment to erupt into the ultimate holocaust. Tennessee Williams said that if people behaved the way nations do, they would all be put in straight-jackets. Back about the time I was born, Lloyd George was saying that the world was starting to resemble a lunatic asylum run by lunatics. But of course all these disasters are minor side-effects. The really important thing is that everybody has a big car, which he hasn't paid for yet, and a color TV, and a power mower out on his front lawn.

Now you *are* being cynical.

Oh sure. There must be something wrong with me because I don't understand why a professional prize-fighter makes more money in one night than I do in five years of scientific research. Demented priorities, someone called it. And you're telling me that *this* is the sort of civilization we're going to be spreading throughout the Galaxy? What do you think we have to offer to some alien culture which could very well be thousands of years ahead of us?

Well, they might find it interesting to study a really primitive society. Their anthropologists could write books about us.

As a horrible example? Yes, well, they say nobody is *completely* useless. The failure of the human experiment could at least serve as a warning to others.

But don't you think that human culture is a self-correcting process; that we do eventually learn from our mistakes, so everything isn't really so hopeless as you imply?

In my cheerier moments I'm inclined to think so. But present trends are not at all encouraging. In spite of all the talk about overpopulation, the increase is still something like 2 percent per year, which works out to a doubling-time of 35 years. In spite of all the talk about world peace, we're still obsessed with the "school bully" idea that we have to be stronger than anybody else to avoid being attacked. That seems logical, as long as it's possible to remain on top. But of course we can't. Any degree of preparedness that we achieve can be equaled or surpassed by our enemies. So there's no solution with a policy like that. It merely guarantees a constant crisis. The one real solution would be some kind of a workable world order, accompanied by total worldwide disarmament. No deadly weapons anywhere, so no one has to worry about sudden aggression. We all agree to stop all this obscene nonsense, and work together to make the world a better place for man.

Government leaders would reject that as totally unrealistic, you starry-eyed dreamer.

Yes, of course. Business leaders wouldn't go for it either, since the sale of armaments is a multi-billion dollar industry. And the military leaders...well, they're working on strategies right now to "win" an atomic war. I suppose *that's* realistic? Are we really sure we *want* peace? War and constant preparation for war seems to serve a very important function in the modern world. Suppose *real*, genuine peace broke out tomorrow. No more danger from any of our supposed enemies. That would be pretty terrible news for some people, wouldn't it? What would all the generals and the munitions makers do?

Don't worry about it. It's not going to happen.

No, I'm sure they'll see to that. And I doubt that much real progress is going to be made in environmental matters either. In spite of everything the ecologists have written during the last three decades, we still seem to be stuck with the idea that industrial progress comes first. We have to get the economy back to "normal" and keep technology forging ahead. This is going to solve everything. Well, I don't see it working out like that. And we are not going to become independent of the natural world. Not ever.

Let's get back to outer space again. If a space colony would isolate man from much of the natural world, it would at least bring him closer to the stars. Don't you think that it would at least encourage astronomy?

Probably not. Did you ever try to look through an eyepiece while wearing a space helmet? You would have your choice of either that, or observing through thick glass or plastic windows. How good a view of the real night sky would you ever get? And did you ever think how rapidly the stars go by when the whole colony has

to make one turn every few minutes to maintain artificial gravity? You would never have the direct, immediate experience of walking out at night under the stars.

An orbiting observatory could be designed to solve such problems.

Yes, but that again would be for the technician and the scientific expert. There wouldn't be anything much in the way of amateur astronomy. Or anything else for the average man. And to add one final grouch...

Go ahead.

I really don't see much scope in any of this for individual adventure and achievement, and what we call free enterprise. Free enterprise for who? Huge national governments? Giant multi-megabuck corporations? No one else can afford to make the staggering investments involved. The starry-eyed space-kid sees himself blasting off to seek his fortune out among the asteroids, like a bold pioneer riding off into the sunset. But it wouldn't be at all like that in reality. He would more nearly resemble a displaced person waiting in line to be processed and shipped off to a refugee camp. Processed...that's a horrible word, isn't it? It makes you think of slabs of beef on a factory conveyor belt...

Do you think it would really be like that?

Considering the steady loss of personal freedom in the modern world, I really doubt that there would be much allowed in the exploitation of space resources, where the whole operation would be controlled by corporation executives or authorized military personnel. For the same reason, I don't see the likelihood of much personal freedom in a space colony, where virtually everything has to be artificially controlled. The whole thing, in fact, would have a strong attraction for the bureaucratic type of mind, people who love to invent rigid rules and enforce inexorable policies. Now I'll admit that there is some pretty weighty opinion to the contrary. Ray Bradbury pointed out that there isn't a single mention of space travel in *1984* as an alternative to "Big Brother," and this proves how myopic George Orwell and his fellow-intellectuals were in the 1940's. Well, I'm not sure that Bradbury is making a significant point. Just how would you engineer an escape into outer space without Big Brother knowing about it? And in a *1984* type world, how much freedom would you expect from the authorities who operate space colonies? There is a definite potential here for a rigid, authoritarian tyranny, worse than anything on earth.

There could be a number of space colonies, each with a different style culture. You could take your choice. You'd have that much freedom, at least.

Uh-huh. I've heard that. A German-style colony, with lots of sauerkraut, I suppose, and a Japanese one with everybody wearing kimonos and sipping *sake*. Yes. It's Disneyland all over again. At best these would be cute little museum dioramas. A genuine national culture is the result of centuries of interaction between man and the land, the climate, the geography, the weather, the unique influences that make one spot so different from another. A national culture is not something that can be picked up bodily and transported somewhere else, least of all to a space colony where none of the original influences would exist at all.

You're worried about being stuck in a colony that wouldn't suit your unique temperament? But with enough colonies, there could be something for everybody. Or almost, anyway.

Yes, almost. Except for people like Himalayan climbers and deep-sea explorers and wilderness nuts, obviously. Well, I hear some really weird suggestions. We could have Playboy swinging hedonistic colonies, and hippie-style artistic ones, and rigidly moralistic hard-shell fundamentalist ones. Great. Choose your prison. Would you be free to do that? If you were born into a Puritan fundamentalist colony, do you think you would be *allowed* to move to the Playboy one? I can't quite see Big Brother being so indulgent as that.

Now you're being pessimistic again.

Possibly. But some of the arguments for an enormous space population strike me as pure padded-cell. Entertainment would be marvelous, we are told, because there would be several thousand Shakespeares and Toscaninis alive and working at any one moment. Genius is purely a matter of straight percentage, they claim; have a hundred times as many people and you'll have a hundred times as many geniuses. Oh really? Well, New York today has at least 25 times the population of London in 1600, so there should be several dozen Shakespeares writing in New York City alone. Where are they? Where are the figures of the stature of Michelangelo and Bach and Rembrandt? For some odd reason, our society hasn't come up with any people like that. If they exist at all, they're doing other things. What sort of deathless masterpieces do you think Shakespeare would have created if he had lived all his life in the restrictive atmosphere of a space colony? And what would any genius accomplish if there were several thousand others of equal stature in his society? Somebody like Shakespeare stands out, even today, because he is absolutely unique. If there were a thousand others like him, nobody would pay the slightest attention to *any* of them. Even a great potential genius would simply get lost in the crowd. With more and more people it gets harder and harder for *anyone* to achieve any kind of greatness. How many really memorable figures can you find in today's world? And I don't mean cult heroes or pop-fad people whose fame is totally synthetic.

You don't think that the space age will really inspire a new burst of creativity.

Well, it hasn't inspired anything much yet in the way of great poetry, or great literature, or even a rash of popular ballads. Truck drivers, yes, but not astronauts. There is some very interesting space art, I'll admit, but there again it's chiefly *fantasy* art. There are thousands of people who claim to be thrilled to the depths by the thought of adventuring in space, but they're thinking again in terms of *fantasy*. The idea of living in space may seem tremendously exciting, if your thinking doesn't go beyond those far-out covers on the SF novels. The Old West wasn't really the way we picture it, and it's highly doubtful that actual living in space would be the way we imagine it either. The reality could easily be a tremendous anti-climax. In fact it could be downright *dull*.

I'll repeat what I said a minute ago. You're being pessimistic again.

Possibly. But this appealing idea of a new "space frontier," open to a bold new breed of explorer... Well, it's simply unrealistic. The old-time pioneer could hitch up the buckboard and head off into the west to see a new life; you can't do that when the price of the buckboard is up there in the millions. On Earth you can go almost anywhere if you are really determined. You can walk to South America; you can cross the Atlantic in a rowboat that you built in your backyard. But you can't go into outer space in a vehicle that you built in your backyard. Never. No way. The exploitation of outer space is open only to huge organizations that already have a money-bin the size of Fort Knox.

Still, you agree that we'll all benefit from the achievements of the space program.

Oh certainly, if you're talking about knowledge of the universe and various advances in technology. Yes, there will be all sorts of spin-off benefits which will trickle down to the average citizen, eventually. For 10 percent down and easy monthly payments, of course. In the meantime, I don't think I'll be making any plans to seek my fortune somewhere out past Alpha Centauri.

You're not going to be a bold pioneer and ride off into the sunset?

Me? Right now I can't even afford to fly to New York.

That's your fault. You wanted to be an astronomer. But maybe you'll make a million dollars on your next book.

I hope so. My horoscope this morning was very encouraging.

Are you working on a next book?

Oh yes. But not an astronomical work. This is an epic fantasy in the Tolkien-Oz-Narnia tradition.

Everyone else seems to be doing that. You might as well too. What's it going to be like? Is it an adult fantasy?

I would rather say it's intended to be suitable for readers of all ages; all, at least, who remain young at heart.

What are you calling it?

The Chronicles of Deriyabar. It's a tale of magic and suspense and high adventure, centered around the theme of the quest for a wondrous enchanted island. With four young and thoroughly human heroes who learn, bit by bit, that they have been chosen for a great and splendid destiny.

Unicorns and dragons too?

Oh of course. And enchanted swords. And haunted castles. And a goodly supply of creepy horrors, naturally. And lots of joy and humor. But I don't think of the thing as just a story, you see. What I am doing here is building up an entire world, and an entire new myth-tradition. So there is a definite parallel here with Tolkien's Middle-Earth. Aside from that, my style is nothing like his, so no one will be able to say that *Deriyabar* is just another second-rate imitation of *The Lord of the Rings*.

Is it going to run to 2,000 pages and weigh ten pounds?

Not unless I have another spell of insanity. I could, at any moment.

What do you think about the chances of publication?

Probably rather slight. Partly because of its size — I have it set up as a six-book series — and partly because I don't write in the terse, spare, understated style which modern publishers seem to think absolutely essential. In an epic fantasy, where I am dealing with wondrous and magical things, I like a lot of colorful exuberance and unabashed eagerness, and touches of baroque splendor. I feel that a fantasy written in a taut, clipped, grittily realistic style is a contradiction in terms. Anyone who prefers that sort of thing can go and read some modern hard-boiled detective yarn. Or one of those bleak, sordid, pathological studies of degeneracy and hopeless despair in a squalid Brooklyn slum. I don't see anything very attractive about that kind of stuff. If you go for it, well, go ahead. It's a big world, after all. Plenty of room for all sorts of different styles and techniques. I'm offering something else.

You sound like you've been having some battles with publishers.

It hasn't really come to that yet. Perhaps it never will. But you run into some weirdly close-minded people in the business. If you don't write like Hemingway, you're automatically accused of "overwriting." Unless your heroes are jaded world-weary barbarians who haven't got an inch of brain between their eyebrows, you're accused of indulging in sentiment and whimsy. Nobody in a story must ever show any real feeling, or display any genuine open-eyed wonder at the marvels of their world; this is condemned as "unrealistic" or "romantic." The modern reader won't go for it, they'll tell you. The only thing that will hold their attention is lots of swift, exciting action and gory violence and sordid brutality. And forget all those little extra touches that give your story its unique personality; the modern reader has no time for anything like that. Ruthlessly cut out everything that does not immediately move the action right along like a juggernaut.

That sounds like the philosophy of the hack writer.

Yes. But that's the sort of stuff that will *sell*, they'll tell you. They'll also tell you that the important thing is to dazzle the reader with a lot of strong, colorful action right at the beginning; otherwise he will complain that nothing seems to be happening, and toss your book aside with a yawn and reach for something else. Or turn on the TV.

Your tastes are a little different.

Well, yes. I really prefer a story which starts out rather quietly and builds up step by step to exciting things. When you write a symphony you don't put the thunderous climax in the first few bars. You work up to it bit by bit. And I don't care at all for a story which plunges the reader into furious action at the very beginning. In the first place I don't know enough about the background to understand what any of this means, so the whole thing is liable to be bewildering rather than exciting. And in the second place, I don't know enough about the characters to really care *what* happens to them. Let me illustrate this...

Sure.

Suppose you're reading your morning paper, and you come across a headline: "Twenty-eight People Die in Fiery Train Wreck in Pennsylvania." You murmur, Oh my, isn't that terrible, and go on to the sports page. Suppose, however, that among the victims you suddenly catch sight of the name of your wife or son, or even your next door neighbor. *Then* your reaction is going to be *very* different. Naturally. The whole thing suddenly becomes horrifyingly real to you. Well, fiction isn't any different.

I can't argue that. But most serious writers don't depend on constant violent action to hold the reader's interest.

No. I can't write for people who expect my hero to be fighting hordes of monsters by the middle of page 3, and feel cheated unless there is someone dangling over an active volcano at the end of every chapter. I am introducing my reader to a whole new world, and he has to be willing to come along with me for a little while. What's all the rush about, anyway? Unless you are ninety-eight years old and hooked up to a life-support system, you expect to last a while yet, don't you? Does anybody expect to get through something like *The Lord of the Rings* in a single night? Slow down. Take your time. When the Good Lord made time, as the Irish put it, he made *plenty of it*.

In an age of movies and TV, a lot of people don't have the patience to put any effort into reading a long story. Everything has to happen instantly.

Yes, well, it's a mystery to me why such people still exist. Surely they should have committed suicide at about the age of eight, on the grounds that nothing very exciting had happened so far, and if that's all life's going to amount to, it obviously isn't worth it to stick around to see the rest of it. If both readers and publishers are so unperceptive as that, it isn't hard to see why there is so little of any real value on the book racks. Only trash sells.

But a number of good-sized fantasies *have* been quite successful. That must prove something.

Well, it proves that the typical publisher doesn't have much real understanding of public taste. Tolkien's epic was accepted with grave misgivings; no one expected it to be a tremendous success. Frank Herbert says that *Dune* was rejected by all the major publishers; twenty-two of them if you include the cases where he was told that there wasn't any point in even submitting the manuscript. Another case is Asimov's *Foundation* series. The author himself admitted that he felt quite uneasy about the work because it contained almost no real action or exciting suspense. Well, *Dune* really doesn't either. Both of these classics are very long, very detailed, slow-moving, rather dense and opaque in style... So is the *Thomas Covenant* series. Whatever the appeal of these things is, it isn't this old hackneyed idea of constant taut, fast-paced action. Any orthodox publisher would dismiss all this stuff as tedious, tiresome, and boring, you would think. Pure dullsville. So what has happened? *All* three have been marvelously successful. So obviously there is something wrong with the narrow-brained attitude of the average publisher. And the professional critic.

Do you think it's just a matter of individual taste? If a publisher doesn't go for something, he assumes that the general public won't like it either?

Well, a publisher has to read with one eye on the cash register, naturally. But it's a little hard to say why a publisher would fail to see the possibilities of something like the Tolkien epic. Looking back on the whole thing now, you would imagine that *any* publisher in his right mind would say, "There are millions who would find this thoroughly delightful." Anyone who couldn't see that *immediately* should either get himself a seeing-eye dog, or be confined for life in a padded cell.

He is either blind or crazy.

Yes. That's what I said. But individual taste is a really curious thing. I recall hearing one lady — quite intelligent in all other respects — say that she couldn't enjoy anything like *The Lord of the Rings* because "it's too impossible." Oh my. How awful. I guess *The Wizard of Oz* is a closed book to her too. And so is *The Arabian Nights*. And *The Martian Chronicles*. I don't know what to say about such people except to class them among the mental defectives. There is obviously something wrong with their brains. Well, you can't argue with personal taste. if you go for Mickey Spillane, go ahead and read him; if you enjoy *Pollyanna* or Horatio Alger, that's all right too, I guess. It's a free country. But nobody with such limited tastes should be on a publishing staff, making decisions about what should be produced for the reading public.

Do you think there are millions who would find *Deriyabar* thoroughly delightful?

Naturally. But I am such an eccentric, you see, that I can't trust my own tastes. Or so they tell me.

Good luck, anyway. One last question — how did you happen to get into astronomy in the first place?

When I was nine or so — something like that — I came across a little book called *Seeing Stars* at the local five-and-ten. It had simple sky maps and some notes on the interesting objects in each area. And you can imagine how long ago that was when I tell you that it cost all of fifteen cents.

Bob, you've given us quotes from just about everyone tonight. How about finishing up our evening with a quote from *Deriyabar*?

All right. Here's one from Book III. This is Altanynn the Wizard, High Mage of Deriyabar in the ancient days, speaking to his disciples: "*The wisdom which I would give you now consists of nothing more than this: The Universe is intelligent, with an all-pervading wisdom far beyond the comprehension of Man. Do not think how you shall rule it, or what you shall command. Think rather how you shall*

conquer yourself. For without that conquest and the enlightenment it brings, you are fit to rule over nothing, not even a single dust-mote in the sunbeam..."

Thank you, Bob. We'll all look forward to seeing the *Chronicles of Deriyabar*.

Flagstaff, Arizona
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