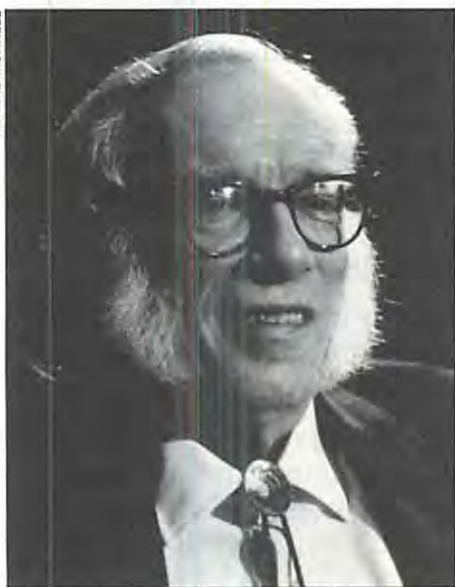

Isaac Asimov

W R I T E R

GERARD MURRELL



A reader can hardly miss Isaac Asimov. He's written nearly four hundred books. Science fiction, of course: his Foundation Series is a classic. Science fact: chemistry, astronomy, physics, biology. Children's books. History. Math. One scientist has called him the greatest explainer of the age. The American Humanist Association, of which he recently became president, has honored him as Man of the Year.

MOYERS: You've written three hundred and ninety-one books, you read about everything from supernovas to the invention of hay, you have no researchers or clerical help, you do your own filing, your own phoning. When I called to ask you about this interview, you answered the phone yourself. How do you organize it all? How do you keep up?

ASIMOV: When I started out, I assumed that with luck, I'd sell a few dozen stories in my life, so I wouldn't need a secretary or a very fancy filing system. I just made do with card files and my memory. Things got more and more complicated, but never so rapidly that I felt called upon to change. It's like the ancient story of Milo of Croton, who is supposed to have lifted a calf every day until finally he was lifting a full-grown bull. Here I am with a full-grown bull.

MOYERS: A Bell Labs report said there is more information in a single edition of the *New York Times* than a man or woman in the sixteenth century had to process in the whole of his or her life. You seem to keep up.

ASIMOV: You know how we get away with it? When you read the *New York Times*, you read almost nothing in it. You're looking for things that interest you, so most of the things just pass under your eyes without notice.

MOYERS: Is that what you do when you are researching? Do you learn to discriminate?

ASIMOV: I must, otherwise I could never get through everything. It's impossible for me to go through the *New York Times* and not see an article that in any way reflects on science. But on the other hand, it's impossible for me to go through the *New York Times* and notice anything that reflects on fashion.

MOYERS: Do you think that we can educate ourselves, that any one of us, at any time, can be educated in any subject that strikes our fancy?

ASIMOV: The key words here are "that strikes our fancy." There are some things that simply don't strike my fancy, and I doubt that I can force myself to be educated in them. On the other hand, when there's a subject I'm ferociously interested in, then it is easy for me to learn about it. I take it in gladly and cheerfully. I've written more books on astronomy than on any other science, but I've never taken a course in astronomy. I'm completely self-trained in it. On the other hand, I've written relatively few books on chemistry, which is my field of training. I've got a Ph.D. in chemistry, but I know too much chemistry to get excited over it.

MOYERS: Learning really excites you, doesn't it?

ASIMOV: Just yesterday I read about the invention of hay in Freeman Dyson's new book. The thought that occurred to me was, "Why is it I never thought of this? How is it I never knew about this? What made me think that hay existed from the first day of creation?"

MOYERS: What is exciting about that?

ASIMOV: I think it's the actual process of broadening yourself, of knowing there's now a little extra facet of the universe you know about and can think about and can understand. It seems to me that when it's time to die, there would be a certain pleasure in thinking that you had utilized your life well, learned as much as you could, gathered in as much as possible of the universe, and enjoyed it. There's only this one universe and only this one lifetime to try to grasp it. And while it is inconceivable that anyone can grasp more than a tiny portion of it, at least you can do that much. What a tragedy just to pass through and get nothing out of it.

MOYERS: When I learn something new—and it happens every day—I feel a little more at home in this universe, a little more comfortable in the nest. I'm afraid that by the time I begin to feel really at home, it'll be over.

ASIMOV: I used to worry about that. I said, "I'm gradually managing to cram more and more things into my mind. I've got this beautiful mind, and it's going to die, and it'll all be gone." And then I thought, "No, not in my case. Every idea I've ever had I've written down, and it's all there on paper. I won't be gone. It'll be there."

MOYERS: You realize how depressing this thought is for the rest of us who can't write it down the way you can. One could say, "Since I can't write the way Isaac Asimov does, and know what Isaac Asimov knows, I won't do it at all."

ASIMOV: I wouldn't want people to do that. A little is better than nothing. In fact, you could say that I overdo it. Lately I've been thinking that people must look upon me as some kind of a freak. There was a certain pleasure writing a hundred books—you know, I felt I'd accomplished something. Then two hundred. But now it stands at three hundred and ninety-one. It's liable to be four hundred by the end of the year, and I have every intention of continuing because I enjoy the process. In the end, it might be that nobody will care about what I write—just about the number. Maybe I will have defeated myself in that way.

MOYERS: How do you explain yourself to yourself? What is it that causes a man to know so much that he could write four hundred books?

ASIMOV: I suppose it's sheer hedonism. I just enjoy it so. What made Bing Crosby or Bob Hope play all that golf, you know? They enjoyed it—and that's the way it is with me.

MOYERS: Is it possible that this passion for learning can be spread to ordinary folks out there? Can we have a revolution in learning?

ASIMOV: Yes, I think not only that we can but that we must. As computers take over more and more of the work that human beings shouldn't be doing in the first

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place—because it doesn't utilize their brains, it stultifies and bores them to death—there's going to be nothing left for human beings to do but the more creative types of endeavor. The only way we can indulge in the more creative types of endeavor is to have brains that aim at that from the start.

You can't take a human being and put him to work at a job that underuses the brain and keep him working at it for decades and decades, and then say, "Well, that job isn't there, go do something more creative." You have beaten the creativity out of him.

But if from the start children are educated into appreciating their own creativity, then probably almost all of us can be creative. In the old days, very few people could read and write. Literacy was a very novel sort of thing, and it was felt that most people just didn't have it in them. But with mass education, it turned out that most people could be taught to read and write. In the same way, once we have computer outlets in every home, each of them hooked up to enormous libraries, where you can ask any question and be given answers, you can look up something you're interested in knowing, however silly it might seem to someone else.

Today, what people call learning is forced on you. Everyone is forced to learn the same thing on the same day at the same speed in class. But everyone is different. For some, class goes too fast, for some too slow, for some in the wrong direction. But give everyone a chance, in addition to school, to follow up their own bent from the start, to find out about whatever they're interested in by looking it up in their own homes, at their own speed, in their own time, and everyone will enjoy learning.

MOYERS: What about the argument that machines, like computers, dehumanize learning?

ASIMOV: As a matter of fact, it's just the reverse. It's through this machine that for the first time, we'll be able to have a one-to-one relationship between information source and information consumer. In the old days, you used to hire a tutor or pedagogue to teach your children. And if he knew his job, he could adapt his teaching to the tastes and abilities of the students. But how many people could afford to hire a pedagogue? Most children went uneducated. Then we reached the point where it was absolutely necessary to educate everybody. The only way we could do it was to have one teacher for a great many students, and to give the teacher a curriculum to teach from. But how many teachers are good at this? As with everything else, the number of teachers is far greater than the number of good teachers. So we either have a one-to-one relationship for the very few, or a one-to-many for the many. Now, with the computer, it's possible to have a one-to-one relationship for the many. Everyone can have a teacher in the form of access to the gathered knowledge of the human species.

MOYERS: But you know, we have such a miserable record in this country of providing poor children even with good classrooms that I wonder if our society can ever harness itself to provide everyone, including poor children, with good computers.

ASIMOV: Perhaps not at the very start. That's like asking yourself, "Is it possible

to supply everybody in the nation with clean water?" In many nations it is impossible to get clean water except under very unusual circumstances. That was one reason why people started drinking beer and wine—the alcohol killed the germs, and if you didn't drink that, you died of cholera. But there are places where you can supply clean water for nearly everyone. The United States probably supplies clean water for a larger percentage of its population than almost any other nation can. So it's not that we would expect everybody to have a perfect computer right away, but we can try for it, and with time, I think more and more will. For goodness' sake, when I was young, very few people had automobiles or telephones, and almost nobody had an air conditioner. Now these things are almost universal. It might be the same way with computers.

MOYERS: What would such a teaching machine look like?

ASIMOV: I find that difficult to imagine. It's easy to be theoretical, but when you really try to think of the nuts and bolts, then it becomes difficult. I could easily have imagined a horseless carriage in the middle of the nineteenth century, but I couldn't have drawn a picture of it. But I suppose that one essential thing would be a screen on which you could display things, and another essential part would be a printing mechanism on which things could be printed for you. And you'll have to have a keyboard on which you ask your questions, although ideally I would like to see one that could be activated by voice. You could actually talk to it, and perhaps it could talk to you too, and say, "I have something here that may interest you. Would you like to have me print it out for you?" And you'd say, "Well, what is it exactly?" And it would tell you, and you might say, "Oh all right, I'll take a look at it."

Anything that would make you feel the teacher was more human would be pleasant for you. And yet, you can never tell. I was once shown a device that had a certain number of set statements like "Yes, sir," "Immediately"—things like that. After you've heard it for the tenth time, it irritates you. So I suppose it's not wise to try to figure out in advance too much what things will look like or be, but let the public demand guide what one produces.

MOYERS: But the machine would have to be connected to books, periodicals, and documents in some vast library, so then when I want to look at Isaac Asimov's new book *Far as Human Eye Could See*, the chapter on geochemistry, I could punch my keys and this chapter would come to me.

ASIMOV: That's right, and then of course you ask—and believe me, I've asked—this question: "How do you arrange to pay the author for the use of the material?" After all, if a person writes something, and this then becomes available to everybody, you deprive him of the economic reason for writing. A person like myself, if he was assured of a livelihood, might write anyway, just because he enjoyed it, but most people would want to do it in return for something. I imagine how they must have felt when free libraries were first instituted. "What? My book in a free library? Anyone can come in and read it for free?" Then you realize that there are some books that wouldn't be sold at all if you didn't have libraries.

MOYERS: With computers, in a sense, every student has his or her own private school.

ASIMOV: Yes, he can be the sole dictator of what he is going to study. Mind you, this is not all he's going to do. He'll still be going to school for some things that he has to know.

MOYERS: Common knowledge, for example.

ASIMOV: Right, and interaction with other students and with teachers. He can't get away from that, but he's got to look forward to the fun in life, which is following his own bent.

MOYERS: Is this revolution in personal learning just for the young?

ASIMOV: No, it's not just for the young. That's another trouble with education as we now have it. People think of education as something that they can finish. And what's more, when they finish, it's a rite of passage. You're finished with school. You're no more a child, and therefore anything that reminds you of school—reading books, having ideas, asking questions—that's kid's stuff. Now you're an adult, you don't do that sort of thing any more.

MOYERS: And in fact, like prison, the reward of school is getting out. Kids say, "When are you getting out?"

ASIMOV: Every kid knows the only reason he's in school is because he's a kid and little and weak, and if he manages to get out early, if he drops out, why he's just a premature man.

MOYERS: I've talked to some of these dropouts, and they think they've become men because they're out of school.

ASIMOV: You have everybody looking forward to no longer learning, and you make them ashamed afterward of going back to learning. If you have a system of education using computers, then anyone, any age, can learn by himself, can continue to be interested. If you enjoy learning, there's no reason why you should stop at a given age. People don't stop things they enjoy doing just because they reach a certain age. They don't stop playing tennis just because they've turned forty. They don't stop with sex just because they've turned forty. They keep it up as long as they can if they enjoy it, and learning will be the same thing. The trouble with learning is that most people don't enjoy it because of the circumstances. Make it possible for them to enjoy learning, and they'll keep it up.

There's the famous story about Oliver Wendell Holmes, who was in the hospital one time, when he was over ninety. President Roosevelt came to see him, and there was Oliver Wendell Holmes reading the Greek grammar. Roosevelt said, "Why are you reading a Greek grammar, Mr. Holmes?" And Holmes said, "To improve my mind, Mr. President."

MOYERS: Are we romanticizing this, or do you think that Saul Bellow's character Herzog was correct when he said that the people who come to evening classes are only ostensibly after culture. What they're really seeking, he said, is clarity, good sense, and truth, even an atom of it. People, he said, are dying for the lack of something real at the end of the day.

ASIMOV: I'd like to think that was so. I'd like to think that people who are given a chance to learn facts and broaden their knowledge of the universe wouldn't seek so avidly after mysticism.

MOYERS: What bothers you about mysticism?

ASIMOV: The same thing bothers me about mysticism that bothers me about con men. It isn't right to sell a person phony stock, and take money for it, and this is what mystics are doing. They're selling people phony knowledge and taking money for it. Even if people feel good about it, I can well imagine that a person who really believes in astrology is going to have a feeling of security because he knows that this

is a bad day, so he'll stay at home, just as a guy who's got phony stock may look at it and feel rich. But he still has phony stock, and the person who buys mysticism still has phony knowledge.

MOYERS: What's the real knowledge?

ASIMOV: We can't be absolutely certain. Science doesn't purvey absolute truth. Science is a mechanism, a way of trying to improve your knowledge of nature. It's a system for testing your thoughts against the universe and seeing whether they match. This works not just for the ordinary aspects of science, but for all of life. I should think people would want to know that what they know is truly what the universe is like, or at least as close as they can get to it. We don't pretend that we know everything. In fact, it would be terrible to know everything because there'd be nothing left to learn. But you don't want to be up a blind alley somewhere.

MOYERS: You wrote a few years ago that the decline in America's world power is in part brought about by our diminishing status as a world science leader. Why have we neglected science?

ASIMOV: Partly because of success. The most damaging statement that the United States has ever been subjected to is the phrase "Yankee know-how." You get the feeling somehow that Americans—just by the fact that they're Americans—are somehow smarter and more ingenious than other people, which really is not so. Actually, the phrase was first used in connection with the atomic bomb, which was invented and brought to fruition by a bunch of European refugees. That's "Yankee know-how."

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There's also this feeling that somehow our free enterprise system alone will do it for us. That helps out in some ways, but not if we're lazy about it. It's not going to do it for us if we don't do anything, you see.

MOYERS: It's astonishing how few American students study mathematics or major in science.

ASIMOV: Yes, we are living in a business society.

MOYERS: And yet there's long been a bias in this country against science. When Benjamin Franklin was experimenting with the lightning rod, a lot of good folk said, "You don't need a lightning rod. If you want to prevent lightning from striking, you just have to pray about it."

ASIMOV: The bias against science is part of being a pioneer society. You somehow feel that city life is decadent. American history is full of fables of the noble virtuous farmer and the vicious city slicker. The city slicker is an automatic villain. Unfortunately, such stereotypes can do damage. A noble ignoramus is not necessarily what the country needs. When Andrew Jackson became President, it was felt that any person could fill any federal office. That started the spoils system we have now: when a new guy comes in, everyone is fired, and the new party puts in the people. That works, if in fact any person can run any job. But you and I know that there are such things as experience and education and intelligence. When the Civil War started, the North had no expertise in fighting and no army worth a darn. Most of the officers with any training were Southerners. We had to learn how to fight the war the hard way, and lost a lot of people that way.

MOYERS: In 1980 you were afraid that the fundamentalists who were coming into power with President Reagan were going to turn this country even further against science, especially with their demands that biblical creationism be given an equal footing in the classroom with science. Have they made those inroads that you feared?

ASIMOV: Fortunately, the currents have been against them. But they still put pressure on school boards and parents, and it's become a little more difficult in many parts of the nation to teach evolution.

MOYERS: The fundamentalists see you as the very incarnation of the enemy, the epitome of the secular humanist who opposes God's plan for the universe. In 1984, the American Humanist Society gave you their Humanist of the Year Award, and you're now president of that organization. Are you an enemy of religion?

ASIMOV: No, I'm not. What I'm against is the attempt to place a person's belief system onto the nation or the world generally. We object to the Soviet Union trying to dominate the world, to communize the world. The United States, I hope, is trying to democratize the world. But I certainly would be very much against trying to Christianize the world or to Islamize it or to Judaize it or anything of the sort. My objection to fundamentalism is not that they are fundamentalists but that essentially they want me to be a fundamentalist, too. Now, they may say that I believe evolution is true and I want everyone to believe that evolution is true. But I don't want everyone to believe that evolution is true, I want them to study what we say about evolution and to decide for themselves. Fundamentalists say they want to treat creationism on an equal basis. But they can't. It's not a science. You can teach creationism in churches and in courses on religion. They would be horrified if I were to suggest that in the churches they teach secular humanism as an alternate way of looking at the universe or evolution as an alternate way of considering how life may have started. In the church they teach only what they believe, and rightly so, I suppose. But on the other hand, in schools, in science courses, we've got to teach what scientists think is the way the universe works.

MOYERS: But this is what frightens many believers. They see science as uncertain, always tentative, always subject to revisionism. They see science as presenting a complex, chilling, and enormous universe ruled by chance and impersonal laws. They see science as dangerous.

ASIMOV: That is really the glory of science—that science is tentative, that it is not certain, that it is subject to change. What is really disgraceful is to have a set of beliefs that you think is absolute and has been so from the start and can't change, where you simply won't listen to evidence. You say, "If the evidence agrees with me, it's not necessary, and if it doesn't agree with me, it's false." This is the legendary remark of Omar when they captured Alexandria and asked him what to do with the library. He said, "If the books agree with the Koran, they are not necessary and may be burned. If they disagree with the Koran, they are pernicious and must be burned." Well, there are still these Omar-like thinkers who think all of knowledge will fit into one book called the Bible, and who refuse to allow it is possible ever to conceive of an error there. To my way of thinking, that is much more dangerous than a system of knowledge that is tentative and uncertain.

MOYERS: Do you see any room for reconciling the religious view in which the universe is God's drama, constantly interrupted and rewritten by divine intervention, and the view of the universe as scientists hold it?

ASIMOV: There is if people are reasonable. There are many scientists who are honestly religious. Millikan was a truly religious man. Morley of the Michelson-Morley experiment was truly religious. There were hundreds of others who did great scientific work, good scientific work, and at the same time were religious. But they did not mix their religion and science. In other words, if something they didn't understand took place in science, they didn't dismiss it by saying, "Well, that's what God wants," or "At this point a miracle took place." No, they knew that science is strictly a construct of the human mind working according to the laws of nature, and that religion is something that lies outside and may embrace science. You know, if there were suddenly to arise scientific, confirmable evidence that God exists, then scientists would have no choice but to accept that fact. On the other hand, the fundamentalists don't admit the possibility of evidence that would show, for example, that evolution exists. Any evidence you present they will deny if it conflicts with the word of God as they think it to be. So the chances of compromise are only on one side, and, therefore, I doubt that it will take place.

MOYERS: What frightens them is something that Dostoevski once said—if God is dead, everything is permitted.

ASIMOV: That assumes that human beings have no feeling about what is right and wrong. Is the only reason you are virtuous because virtue is your ticket to heaven? Is the only reason you don't beat your children to death because you don't want to go to hell? It's insulting to imply that only a system of rewards and punishments can keep you a decent human being. Isn't it conceivable a person wants to be a decent human being because that way he feels better?

I don't believe that I'm ever going to heaven or hell. I think that when I die, there will be nothingness. That's what I firmly believe. That's not to mean that I have the impulse to go out and rob and steal and rape and everything else because I don't fear punishment. For one thing, I fear worldly punishment. And for a second thing, I fear the punishment of my own conscience. I have a conscience. It doesn't depend on religion. And I think that's so with other people, too.

Even in societies in which religion is very powerful, there's no shortage of crime and sin and misery and terrible things happening, despite heaven and hell. I imagine if you go down death row, and ask a bunch of murderers who are waiting for execution if they believe in God, they'll tell you yes. I wouldn't be surprised if the number of people in jail for fraud, for violent crimes, for everything, includes a smaller percentage of acknowledged atheists than we have in the general population. So I don't know why one should think that just because you don't want a ticket to heaven, and you don't fear a ticket to hell, you should be a villain.

MOYERS: Is there a morality in science?

ASIMOV: Oh, absolutely. In fact, there is a morality in science that is further advanced than anywhere else. If you find a person in science who has faked his results, who has lied as far as his findings are concerned, who has tried to steal the work of another, who has done something other scientists consider unethical—well, his scientific reputation is ruined, his scientific life is over. There is no forgiveness. The morality of science is that you report the truth, you do your best to disprove your own findings, and you do not utilize someone else's findings and report them as your own. In any other branch of human endeavor—in politics, in economics, in law, in almost anything—people can commit crimes and still be heroes. For instance, Colonel North has done terrible things, yet he's a hero and a patriot to some people. This goes in almost every field. Only science is excepted. You make a misstep in science, and you're through. Really through.

MOYERS: You love the field, don't you? You love science.

ASIMOV: Oh, I'm very fond of it. I think it's amazing how many saints there have been among scientists. I'll give you an example. In 1900, De Vries studied mutations. He found a patch of evening primrose of different types, and he studied how they inherited their characteristics. He worked out the laws of genetics. Two other guys worked out the laws of genetics at the same time, a guy called Karl Correns, who was a German, and Erich Tschermak von Seysenegg, who was an Austrian. All three worked out the laws of genetics in 1900, and having done so, all three looked through the literature, just to see what had been done before. All three discovered that in the 1860s Gregor Mendel had worked out the laws of genetics, and people hadn't paid any attention then. All three reported their findings as confirmation of what Mendel had found. Not one of the three attempted to say that it was original with him. And you know what it meant. It meant that two of them, Correns and Tschermak von Seysenegg, lived in obscurity. De Vries is known only because he was also the first to work out the theory of mutations. But as far as discovering genetics is concerned, Mendel gets all the credit. They knew at the time that this would happen. That's the sort of thing you just don't find outside of science.

MOYERS: If it is truth that excites you, what is the value of science fiction, for which you are justifiably universally known?

ASIMOV: Okay, let's look at fiction as a whole, just any kind of fiction. In serious fiction, fiction where the writer feels he's accomplishing something besides simply amusing people—although there's nothing wrong with simply amusing people—the writer is holding up a mirror to the human species, making it possible for you to understand people better because you've read the novel or story, and maybe making it possible for you to understand yourself better. This is an important thing.

Now science fiction uses a different method. It works up an artificial society, one which doesn't exist, or one that may possibly exist in the future, but not necessarily. And it portrays events against the background of this society in the hope that you will be able to see yourself in relation to the present society. I don't claim that I succeed at this. It seems to me that to do this properly takes a great man, a guy on the level of—well, at least half that of Shakespeare, and I don't come up there. But I try, and who knows? Maybe once in a while I succeed a little bit. And that's why I write science fiction—because it's a way of writing fiction in a style that enables me to make points I can't make otherwise.

MOYERS: Someone once said that one great advantage of science fiction is that it can introduce the reader to changes that may well be inevitable, but that are not now conceivable.

ASIMOV: I've said that myself at different times. The fact is that society is always changing, but the rate of change has been accelerating all through history for a variety of reasons. One, the change is cumulative. The very changes you make now make it easier to make further changes. Until the Industrial Revolution came along, people weren't aware of change or a future. They assumed the future would be exactly like it had always been, just with different people. You know, as things are, so they remain. As Ecclesiastes says, "There is nothing new under the sun." It was only with the coming of the Industrial Revolution that the rate of change became fast enough to be visible in a single lifetime. People were suddenly aware that not only were things changing, but that they would continue to change after they died. That was when science fiction came into being as opposed to fantasy and adventure tales. Because people knew that they would die before they could see the changes that would happen in the next century, they thought it would be nice to imagine what they might be.

As time goes on, and the rate of change still continues to accelerate, it becomes more and more important to adjust what you do today to the fact of change in the future. It's ridiculous to make your plans now on the assumption that things will continue as they are now. You have to assume that if something you're doing is going

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to reach fruition in ten years, that in those ten years changes will take place, and perhaps what you're doing will have no meaning then. So nowadays futurism has become an important part of thinking in business, economics, politics, and military affairs. Science fiction is important because it fights the natural notion that there's something permanent about things the way they are right now.

MOYERS: You once said that your view of the future changes according to what you read every morning in the daily newspaper. What are you reading in today's newspapers?

ASIMOV: Well, I read that in the Soviet Union, for instance, there are protests here, marches there—that there's a lot of turmoil. It makes me feel that the Soviet Union is gaining strength because when a nation is absolutely quiet, when no one says anything, when you don't hear any controversy going on, that's a kind of death, a death involving fear, a death involving oppression. With turmoil, the Soviet Union is becoming, shall we say, slightly Americanized? I think that's a good thing. I think the fact that Reagan got along so well with Gorbachev, and vice versa, that they were palsy-walsy, with their arms around each other's shoulders, is a great thing. That doesn't mean that tomorrow the Soviet Union is going to be exactly what we want it to be. It doesn't mean that we're going to be exactly what they want us to be. But we're at least moving in the right direction. I hope this means there's just a slightly better chance that we're heading for an era of international cooperation and perhaps the development of a kind of federal world government, which I think is essential.

MOYERS: Use your imagination: If the President asked you to draft his inaugural address and said, "Dr. Asimov, make sure I say the one thing you think I must convince the American people that they should pay attention to," what would it be?

ASIMOV: It would be this: That all the problems that we face now, that are really important, that are life-and-death, are global problems, that they affect all of us alike. The ozone layer, if it disappears, disappears for all of us. Pollution in the ocean, in the atmosphere, in the ground water, is for all of us. The only way we can ameliorate these problems, solve them, prevent them from destroying us, is, again, through a global solution. We can't expect that anything the United States does alone is going to affect the situation the world over. There has to be cooperation among the nations of the world. If we can achieve that in the face of a danger deadlier than has ever faced humanity before, why, one of the advantages we'll have is that automatically we will probably start spending less money on war and preparations for war, which will, in turn, be a beneficial cycle, because we'll have more money for solving these problems we must solve.

MOYERS: You sound more optimistic than you did a few years ago. I read an essay in which you said that we're entering a decade of decision, that we have to make life-and-death decisions about our energy problems, about the fact that we're using up fossil fuel and not developing alternatives, about the population explosion, and about

our constant and pernicious tendency to prepare for war. You said we'll know at the end of the 1980s if we made the right decisions. Have we?

ASIMOV: We haven't made irretrievably wrong decisions. I was afraid that with the atmosphere of the 1980s, the Cold War would intensify and become something we couldn't reverse. But quite suddenly it has been reversed, and for reasons of the kind that always upsets me as a futurist—for unpredictable reasons. There's no way you could have predicted that a man like Gorbachev would come to power in the Soviet Union, a man who is young and flexible and post-Revolutionary in his thinking. And there's no way you could have predicted that Reagan would make this Iran-Contra mistake and feel it necessary in his last year to do something that will make him remembered for some other reason.

And so between Reagan, intent on something upbeat, and Gorbachev, intent on somehow ameliorating the Cold War, we had what you might call a meeting of minds, and the beginning of nuclear disarmament, even if only the beginning. So I have felt a little more confidence all this last year.

MOYERS: What about the subject you've written so much about—the population explosion? Right now, the population of the globe is over five billion. You've warned us about what will happen if it continues at its two percent growth rate per year.

ASIMOV: Actually, the growth rate is down to one-point-six percent, but with the higher population, it's the same amount in actual numbers: eighty million a year. By the year 2000, it's going to be perhaps six-point-five billion.

MOYERS: That's just twelve years from now. How many people do you think the earth is able to sustain?

ASIMOV: I don't think it's able to sustain the five billion in the long run. Right now most of the world is living under appalling conditions. We can't possibly improve the conditions of everyone. We can't raise the entire world to the average standard of living in the United States because we don't have the resources and the ability to distribute well enough for that. So right now as it is, we have condemned most of the world to a miserable, starvation level of existence. And it will just get worse as the population continues to go up.

MOYERS: But you can't just say to a woman, "Don't have children."

ASIMOV: That's not the problem; it's that so many people are saying, "Have children." There is such a pro-natalist attitude in the world. We celebrate Mother's Day so enthusiastically, we say, "May all your troubles be little ones," we celebrate additional children. I feel sometimes that if we'd only stop pushing for children, somehow there would be fewer of them.

MOYERS: Why did you say that the price of survival is the equality of women?

ASIMOV: Because if women are allowed to enter into all facets of the human condition, if they can enter business, if they can enter religion, science, government on an equal basis with men, they will be so busy they won't feel it necessary to have a great many children. As long as you have women under conditions where they don't feel any sense of value or self-worth except as mothers, they'll have a lot of children because that's the only way they can prove they're worth something. In general, if you look through the world, the lower the status of women, the higher the birth rate, and the higher the birth rate, the lower the status of women. If you could raise the status of women, I am certain the birth rate would fall drastically through the choice of the women themselves. We're always saying that there's no fulfillment like having

children, but I notice mostly it's men who say that. You know, men get along without giving birth to children. They do that by finding other things to do. If women could find other things to do, too, they would have fewer children.

MOYERS: But once again, you are in conflict with a biblical imperative, "Be fruitful and multiply."

ASIMOV: Right. But God said that when Adam and Eve were the only two people in the world. He said, "Be fruitful and multiply and replenish the earth." The earth was replenished long ago. That's one of the problems of fundamentalism. Fundamentalists take a statement that made sense at the time it was made, and because they refuse to consider that the statement may not be an absolute, eternal truth, they continue following it under conditions where to do so is deadly.

MOYERS: What happens to the idea of the dignity of the human species if this population growth continues at its present rate?

ASIMOV: It will be completely destroyed. I like to use what I call my bathroom metaphor: If two people live in an apartment, and there are two bathrooms, then both have freedom of the bathroom. You can go to the bathroom anytime you want to and stay as long as you want to for whatever you need. And everyone believes in the freedom of the bathroom; it should be right there in the Constitution.

But if you have twenty people in the apartment and two bathrooms, no matter how much every person believes in freedom of the bathroom, there is no such thing. You have to set up times for each person, you have to bang at the door: "Aren't you through yet?" and so on. In the same way, democracy cannot survive overpopulation. Human dignity cannot survive it. Convenience and decency cannot survive it. As you put more and more people onto the world, the value of life not only declines, it disappears. It doesn't matter if someone dies. The more people there are, the less one individual matters.

MOYERS: People say the United States is bringing its population under control, that many Americans are not even reproducing themselves, and that what the rest of the world does, we can't control.

ASIMOV: The population of the United States is still going up. The only time it went up really slowly was during the Great Depression, when there were no laws lowering the birth rate, there was just an economic depression, which made people think twice before they had children. But the United States is doing something else—it is absolutely refusing to help nations control population. Our feeling is that it's enough for us to make sure that the United States is in good shape, and what other nations do is their business. It's not just their business—it's our business, too.

MOYERS: Can we exist as a stable economy and a stable society if around us are turmoil and chaos?

ASIMOV: Absolutely not. Right now many nations are destroying the rain forests because they need the firewood, and they need the space for farms.

MOYERS: Why should we care about that?

ASIMOV: Because without the rain forests, we're going to have deserts. The food supply will dwindle. As a matter of fact, there's even the possibility that we're going to lose all kinds of valuable substances we know nothing about. Those rain forests have an incredible number of species of plants and animals that we know very little about. Some of them may produce chemicals of great pharmacological and medical

importance. If properly cultivated, some of the plants might be new food sources. In addition to that, nothing produces the oxygen of the atmosphere with the same intensity that a forest does. Anything that substitutes for it will be producing less oxygen. We're going to be destroying our atmosphere, too.

MOYERS: What did you mean when you said once that we have to stop living by the code of the past?

ASIMOV: Times change. For example, in the past we felt motherhood was the most important thing a woman could do, and that to be a good wife and mother was the sum total of a woman's purpose in life. She didn't need an education or interests outside the house. You know, *Kinder, Kirche, Küche*—the children, the church, the kitchen—or in English you say, "Keep 'em barefoot and pregnant." Well, we can't do that any more. We can't raise women to be baby machines. In the old days, we didn't worry about the future. Now we must. Things are changing so fast that we have to worry about the future all the time.

MOYERS: You and I may not be around when it arrives.

ASIMOV: Our children will be, and our grandchildren—and the human race. I don't want to sound like a foolish idealist or as though I just love humanity. But, look, my books are going to survive me—I want to have people alive to read them.

MOYERS: Is it possible that you suffer from an excessive trust in rationality?

ASIMOV: Well, I can't answer that very easily. Perhaps I do, you know. But I can't think of anything else to trust in. If you can't go by reason, what can you go by? One answer is faith. But faith in what? I notice there's no general agreement in the world. These matters of faith, they are not compelling. I have my faith, you have your faith, and there's no way in which I can translate my faith to you or vice versa. At least, as far as reason is concerned, there's a system of transfer, a system of rational argument following the laws of logic that a great many people agree on, so that in reason, there are what we call compelling arguments. If I locate certain kinds of evidence, even people who disagreed with me to begin with, find themselves compelled by the evidence to agree. But whenever we go beyond reason into faith, there's no such thing as compelling evidence. Even if you have a revelation, how can you transfer that revelation to others? By what system?

MOYERS: So you find your hope for the future in the mind.

ASIMOV: Yes, I have to say, I can't wait until everyone in the world is rational, or until just enough are rational to make a difference.

MOYERS: Your latest book—number three hundred and ninety-one—is called *Far as Human Eye Could See*. How far can we see?

ASIMOV: It depends on what we're looking for. If we're looking at human history, we can't see very far because human history is a chaotic thing. Small changes have big results, unpredictable in direction. But if we're looking at something that's essentially simple, such as stars and galaxies and things like that, then it is possible to look far, far ahead. We may be wrong, but it is possible to make a case for something that might happen ten-to-the-hundred years in the future—one with a hundred zeros after it. In fact, that's what I do in the last essay—that's why I call it "Far as Human Eye Could See." It comes from "Locksley Hall," by Tennyson, of course: "For I dipped into the future, far as human eye could see/Saw the Vision of the world, and all the wonder that would be."

MOYERS: You see wonder out there?

ASIMOV: I see a picture of a universe that becomes infinite. It can expand and expand and expand until it is sufficiently thinly spaced to allow another universe to begin. And that perhaps surrounding our universe is the far, faint remnant of another universe; and beyond that, of another one, even fainter, and so on, infinitely. If the universe doesn't expand forever, if it goes into a crunch and disappears, there may be a limitless ocean of vacuum out of which new universes are constantly arising like bubbles in boiling water, some large, some small, some with one set of laws, some with another. We just happen to be living in one that's suitable for life.

And there we get into the Anthropic Principle because we can only exist in one that's suitable for life. The mere fact that we exist makes it suitable for life, you see. There are people who argue that everything in the universe depends upon human observation. Then there are people who say, "Supposing there were no human beings, just frogs. Will the frog observation do the trick?" It's a game for modern scholastics. Instead of how many angels can dance on the point of a pin, we try to argue out quantum weirdness. It's a lot of fun, but it makes you dizzy.

MOYERS: You've lived through much of this century. Have you ever known human beings to think with the perspective you're calling on them to think with now?

ASIMOV: It's perhaps not important that every human being think so. But how about the leaders and opinion-makers thinking so? Ordinary people might follow

them. It would help if we didn't have leaders who were thinking in exactly the opposite way, if we didn't have people who were shouting hatred and suspicion of foreigners, if we didn't have people who were shouting that it's more important to be unfriendly than to be friendly, if we didn't have people shouting that the people inside the country who don't look exactly the way the rest of us look have

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something wrong with them. It's almost not necessary for us to do good; it's only necessary for us to stop doing evil, for goodness' sake.