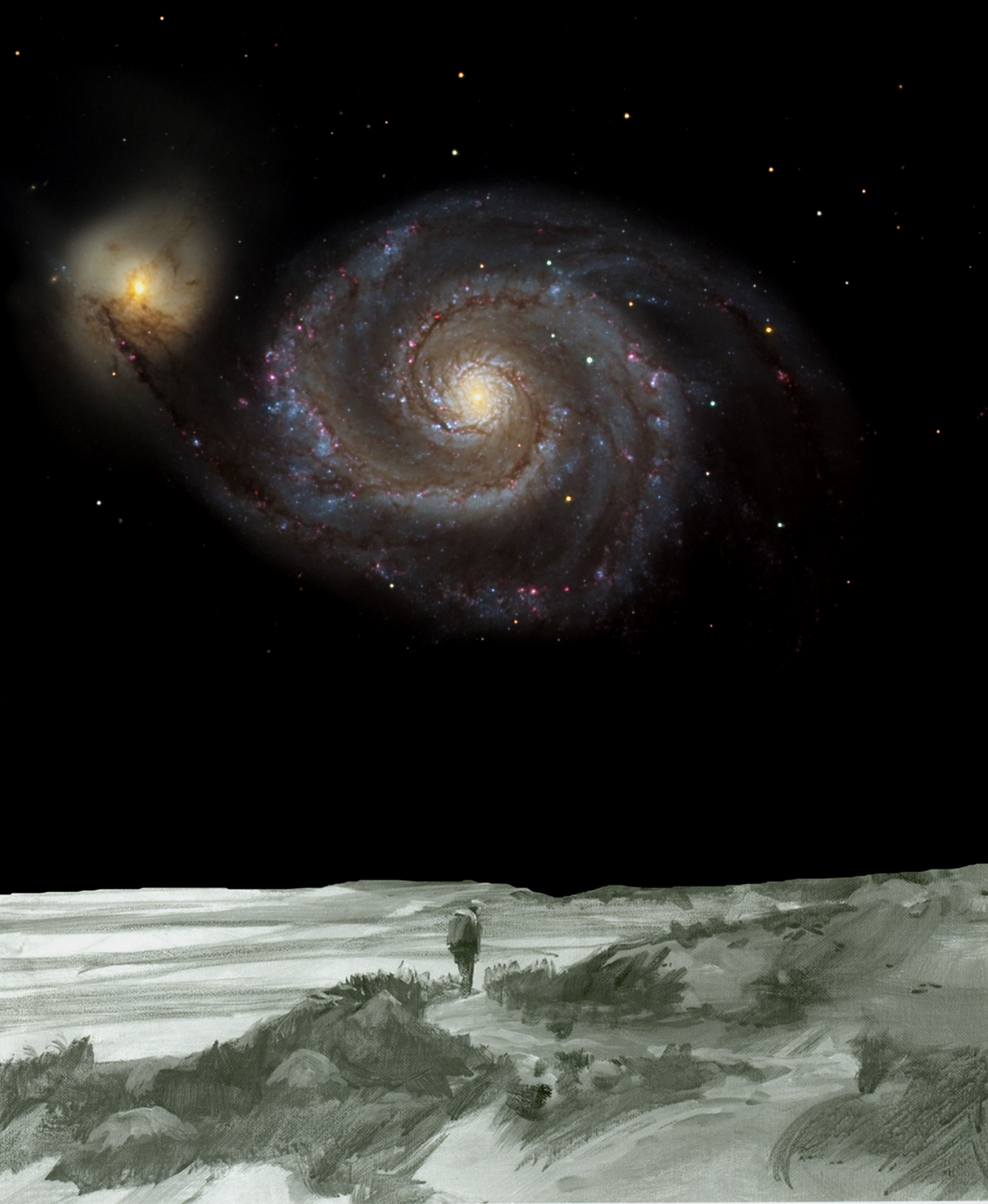


Science and Religion:

An Introduction for Youth

Holmes Rolston III



SCIENCE AND RELIGION

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CHAPTER 1

HOW DO SCIENTISTS/ CHRISTIANS THINK? WONDERING HOW AND WHY!

Who do you know that is a scientist? Ask that person what kind of scientist he or she is. This could be your dad or mother. Or a teacher at school. Or neighbor. Maybe you are already a young scientist who has done experiments at school. How did you go about it? Ask your adult scientist how scientists think. You may get different answers from different scientists, but answers will probably go something like this: scientists study the causes of events in nature, also the social world, and try to find laws and theories that help to explain how these events happen.

Find out whether your scientist works in a laboratory or outdoors (“in the field,” scientists may say). Ask your scientist what he or she has been studying. Maybe trees growing in forests. Or what makes kids sick. It may take some years to learn what scientists already know (a college education and further study). But ask your scientist what’s new. What’s not so well understood yet? This will be called *research*.

When the science has been more or less worked out, scientists will say they have a theory, which has been discovered by studying the observed



CHAPTER 2

PHYSICS – MATTER AND ENERGY – STARS, PLANETS, THE COSMOS

Physics is the science of matter and energy. Matter turns out to be composed of particles that are also energetic waves, so physics is about electricity and radiation. This usually means nature that is not living. Physics studies nature that is very large and very small, and in between. So there is astronomy, about the stars, and microphysics, about atoms, what they are made of and how they interact.

If you have already learned some physics in school, that was probably at the everyday level, maybe about how blocks fall because of gravity. Physics is a science of natural causes. This can also include machines that humans make using such mechanical and electrical causes.

There are related sciences, such as chemistry, and geology, and meteorology (the science of weather). If the physics considers living things, it will be called biophysics, or biochemistry. But here we will be talking mostly about basic physics—large and small. Surprisingly these huge and tiny scales are closely related. That brings up some big questions again, about how physics might be related to religious thinking.

When astronomers look at the stars they see more than what we usually mean by “world.” They see a universe. So they need a bigger name



CHAPTER 3

BIOLOGY – LIFE ON WONDERLAND EARTH!

The physicists are describing a universe “fine-tuned” for life. But the biologists describe life on Earth as a rather messy struggle. Biological activity is a much richer form of matter-in-motion than physics and chemistry can handle. Messy, maybe. But no doubt more complex and more meaningful.

Biology has also developed at two scales, the range of the very small and that of big-scale history. As with physics, the two levels have been theoretically interrelated. Molecular biology, discovering the inherited material in our genes (called *DNA*), has decoded what some biologists may call the “secret of life.” Evolutionary history has located this secret of life in what biologists call *natural selection*. This works over small genetic changes across enormous spans of time, with the *fittest selected to survive*.

Many biologists think it is better to call this the survival of the “better adapted.” “The fittest” seems to mean mainly competition, but survival often involves cooperation, as when animals hunt in packs, or take care of their young. Also survival depends on whether a plant or animal can

A young man and woman are standing in a forest, looking at each other. The woman is on the left, wearing a grey cardigan over a white lace top, holding a book. The man is on the right, wearing a grey hoodie, holding a book, and leaning against a tree. Four thought bubbles are shown above them, connected by thin white lines. The bubbles contain the text: 'Art Class', 'Baseball Team', 'Civil Rights', and 'E=mc²'.

*Art
Class*

**Baseball
Team**

Civil Rights

$$E=mc^2$$

CHAPTER 4

PSYCHOLOGY AND NEUROSCIENCE – MIND – THE WONDER OF WONDERS!!

P psychology is the science of mind. The Greek word for mind is *psyche*. The main minds to study are human minds, but psychologists sometimes study animals. You may think, *Well, what's in my mind is clear enough to me*. If you want to know what's in the minds of other persons, just ask them. But, as before in physics and biology, minds are complex, much more complex.

How much science of persons can we have? That is still debated by psychologists. Part of the answer depends on how much the persons studied are themselves taking part in the science about them. What if the psychologist makes a prediction about me? What if I decide to do something different? Physicists and biologists don't have this kind of problem. Philosophers call it the problem of free will.

The thinking minds of persons lie within their brain, and the human brain has a biology. These minds make possible their own distinctively human kinds of personal experiences. Humans live in a kind of mental world that animals do not. They can think of a self with personal life



CHAPTER 5

SOCIAL SCIENCE – OUR COMMUNITIES AND CULTURES

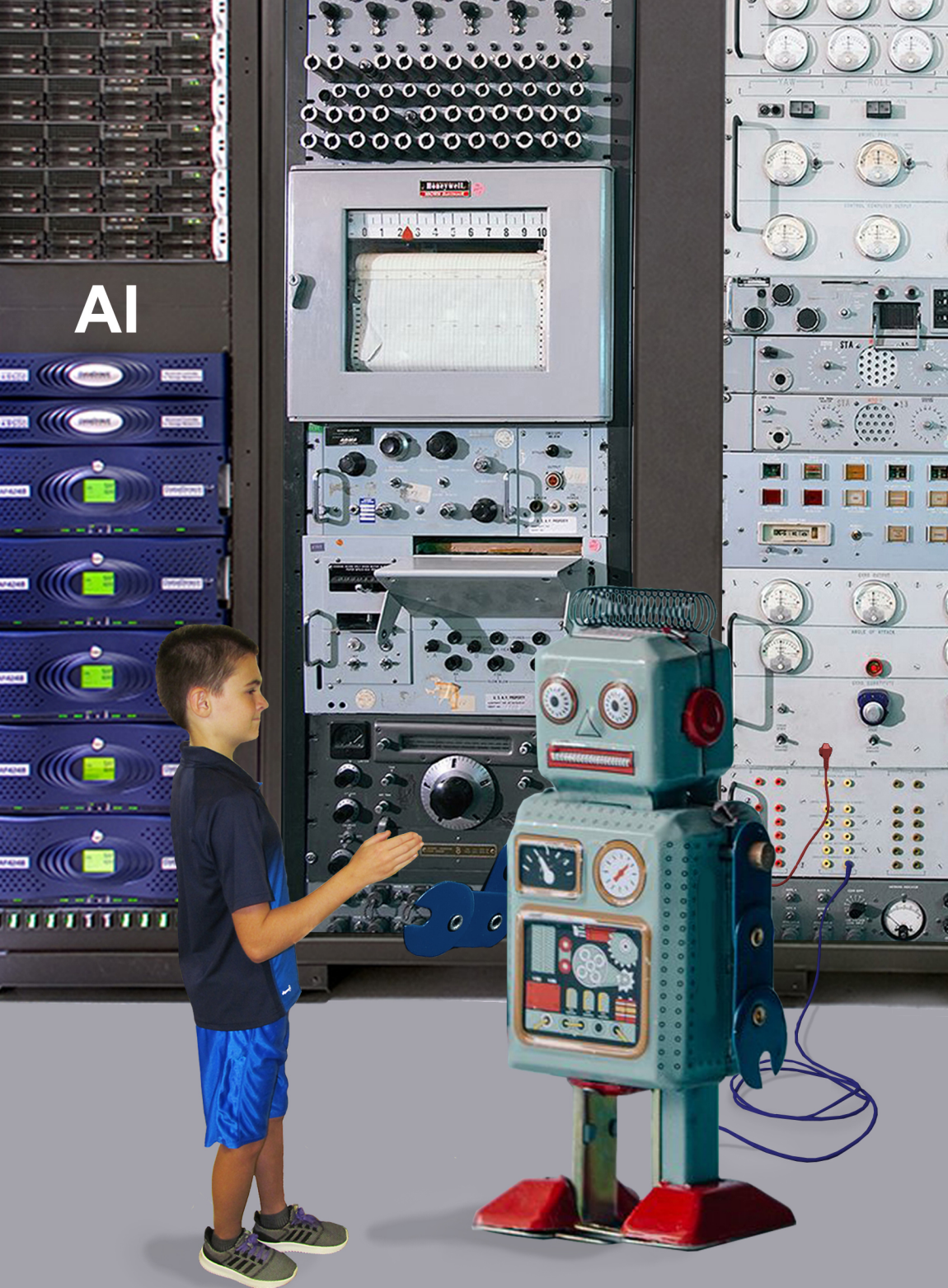
Social science is the study of how people behave when they interact with each other in various ways in groups. A main social science is called *sociology*, which means the logic of society. There are, as you might expect, many branches of social science, since people do lots of things together. Some are economics, political science, government, human geography, and anthropology.

Perhaps the broadest word for all this human activity is *culture*. Culture is “that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.” So wrote one famous social scientist (E. B. Tylor). Later in this book we consider history.

Like other scientists, social scientists try to describe human social behavior, and to find laws, theories, rules that explain and maybe help us predict what people in groups will do. Psychologists often find what the individual will do hard to predict. You might think, *Yes, but it will be easy predicting what large groups of people will do.*

You can use statistics. Their behaviors will average out. This is true. But, as we have found with every science examined so far, things get

AI



CHAPTER 6

COMPUTER SCIENCE — THE NEWEST SUPER SCIENCE

Scientists used to say that there were two kinds of sciences, natural sciences and social sciences. In my lifetime (and that of your parents and grandparents) that has changed. There is a third kind of science: computer science. One enthusiastic computer scientist (Edward Fredkin) says that there are three great events in history: the creation of the universe, the creation of life, and the appearance of artificial intelligence on supercomputers. Artificial intelligence is abbreviated AI.

Humans have had various gadgets to help them think for centuries, such as adding machines or the Chinese abacus, a calculating framework in which you move beads around in groups. We have had electronic calculators for thirty or forty years. But we seldom, if ever, called these activities a science.

What is new today is superpowerful computers, linked together in networks. Such computers, scientists may say, have artificial intelligence. Computers are no doubt faster than the best humans in doing mathematics. That is true even of adding machines and calculators. But computers can do much more. Computers can play chess, a very complicated game, and often beat the best human players.



CHAPTER 7

HISTORY — PAST, PRESENT — AND YOUR FUTURE

Most persons do not call history a science, and I agree. So you might ask, “Hey! Why is the last chapter in this book not a science?” Here is my answer:

The Earth story is super history. It is difficult to imagine a universe more staggering, dramatic, and mysterious than this universe that science has discovered. It is difficult to imagine a universe that starts simpler (perhaps as what physicists call a minute quantum fluctuation in a vacuum) and becomes more complex (*Homo sapiens*, naming itself the “wise” species). This species sequences its own genome, has moral debates about the war in Iraq, invents artificial intelligence, and asks big questions, the biggest questions.

When modern science began it was still called “natural history.” Today scientists prefer more specific names such as physics, biology, geology. They hope to find laws with which to understand what is going on and make predictions. But now, taking the most overall view, we conclude by recognizing how nature, too, has its history, particulars, unique story lines. In the previous chapters, we have discovered that events move from quarks to protons, from amino acids to single-celled animals,



Youth, grades 9-12, can and ought to understand that science and religion are compatible, when appropriately understood.

How Do Scientists/Christians Think? Wondering How and Why!

Physics – Matter and Energy – Stars, Planets, the Cosmos

Biology – Life on Wonderland Earth!

Psychology and Neuroscience – Mind – The Wonder of Wonders!!

Social Science – Our Communities and Cultures

Computer Science – The Newest, Super-Science

History – Past, Present – and Your Future

Holmes Rolston is a retired college professor. He was University Distinguished Professor and Professor of Philosophy at Colorado State University. He taught a class on science and religion for forty years. He also long taught a class on environmental ethics. As a result of his studies, he has written books and other publications. One important thing he did was to give the Gifford Lectures, a famous series of lectures at the University of Edinburgh, Scotland, in 1997-1998.

Dr. Rolston won the Templeton Prize in Religion in 2003 for his lifetime work in science and religion. That prize was worth about a million and a half dollars and he donated it to Davidson College to use teaching about science and religion. He went to college there and his professors helped him to think about science and religion.

Dr. Rolston has travelled a lot. He has spoken as distinguished lecturer on all seven continents. (Can you name them?) When asked about his most scary experience, he says, "In Africa I was once charged by an elephant." When asked his favorite experience, he says, "Finding a Pasqueflower blooming in the woods at Easter." This is an early spring wildflower that blooms in high elevation and northern woods.

One of the reasons he is writing this book is so that his grandchildren, who are in middle school and high school, can read it with him.

Thanks for the artwork to Shannon Nice, and to the journal Science for the DNA-plant-human figure.



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Dear ISSR Member,

Our June blog post is now live! This month is a little different than our normal publications in that this month it is about how the science and religion dialogue can be brought to youth. I think this is an area of importance in our current socio-political climate. Young minds are eager to ask the “big” questions, eager more for answers to them. Science and religion occupies a special place in that those “big” questions are often a part of the field. This is of great interest to youth. Education is important, as the future is so reliant on how the youth of today are educated, and in turn effects how our world will look tomorrow.

You can access the newest post by [clicking here](#).

June 2019 blog

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Holmes Rolston III



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June Blog Post – Science and Religion: An Introduction for Youth by Holmes Rolston III

Science and Religion: An Introduction for Youth

by Holmes Rolston III

I myself have thought about how science and religion fit together since I was a teenager. Now in my mid-eighties, I realize that youth today face an unprecedented hinge point in the 45 million centuries of life on Earth. Our

species, the so-called wise species, *Homo sapiens*, is jeopardizing the future of this wonderland home planet. Science and religion are still most important forces in decisions for the crises of the new millennium. But how so? Isn't there some novelty in how they relate today?

I had written an academic book, mid-career, a critical survey of issues in the field, successful enough to bring me an invitation to give the Gifford Lectures at the University of Edinburgh. Could I simplify that book for youth, updating it with new issues, keeping it respectably academic, and get the oncoming generation thinking hard.

My daughter kept twisting my arm. Daddy, you've published for academics all your life. Now, face the future. Get youth thinking about how science and religion work together before they go to college or get out on the job. Start early. They will be better prepared for life in this post-millennial crisis. Don't they need to be, as never before, as you say, "good adapted fits"? My wife agreed: "She's right."

Writing the text was a challenge. I planned for seven chapters, covering the sciences, featuring issues in ways that would grab the teen age mind. I put in a section on bullying, asking readers if they had been bullies or bullied. I connected with some scientific studies on bullying, which academics in the science and religion dialogue have seldom done.

My grand-daughter does math well and she was invited to go visit a local high-tech industry to learn about STEM. I wanted her, and youth today, to think about what

values guide science, technology, engineering, and mathematics. That invites some serious academic analysis, demanded now and introduced since I gave those Gifford lectures. Back at school, in a review discussion, I suggested she ask if STEM needed to be *baptized*. Maybe you are a scholar in the field. Did you ever ask that question? How would you answer it, for either adults or youth?

High school youth love their computers and smart phones. How smart will computers get? I put in a section on artificial intelligence, inviting youth to wonder about ethics and value judgments. I called computer science a novel science, a super-science. I wanted to prompt an analysis of human thinking versus machine thinking. This again wasn't an issue in the field when I gave the Gifford lectures, but now it needs rigorous analysis. Could I get youth thinking academically about this issue, now, like it or not, on their doorsteps.

I closed with some rocket science. Edgar Mitchell entranced with Earth as a "blue and white jewel," "a small pearl in a thick sea of black mystery." Mitchell concluded, "My view of our planet was a glimpse of divinity." Do science and religion together help you to glimpse divinity at this rupture point in Earth history? Previous generations of youth have not faced this question in that way. That takes some unprecedented academic analysis.

The hardest part, surprisingly, was getting the artwork right. I hoped to get one full page art piece facing the first page of each chapter that might challenge the youthful reader, a fetching drawing or suggestive photo

that invited reflection on some major aspect of the chapter. I am no artist, and it was not easy to find one sympathetic with the venture. Eventually I persuaded a niece of my wife, who had recently graduated from college in art, to work with me. She and I combed the internet for art resources, and I had some bits and pieces from my decades of teaching. But these had to be reassembled into what I needed for the chapters, which is what my artist could do. I thought of this as “analytic art,” art prompting academic analysis in youthful minds.

So we worked out the “thought balloons” of a boy and a girl sharing and not sharing their thoughts as an art piece facing the chapter on psychology and neuroscience, illustrating “theory of mind.” We arranged a boy facing a group and the group variously pondering what to make of the boy, facing the chapter on social science. I talked my grandson into a photo that we could set into a handshake with a robot and found a huge computer set up she could make background. This gets youth thinking about what supercomputers might and might not do.

So here’s hoping that youth will use it. Here’s hoping that even academic in the science and religion field will read it, thinking together with their children and grandchildren. Look at the cover. If that doesn’t set you thinking, never mind opening the book. That cover ought to jog even academics in the field to some serious analysis.

For a taster, [click here](#).

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