Science: A Part of or Apart from Mormonism?

Richard Pearson Smith

Every art and science known and studied by the children of men is comprised within the Gospel.

> President Brigham Young, 1868 (JD 12:257)

Beware of false science.

Priests Study Course, 1973 (Series B, p. 79)

For three decades I have mourned the absence of a benevolent spirit which helped me and my generation of Mormons find our way. I watch incessantly for its resurrection, only to see more nails driven into the coffin from time to time.

When will I again see General Authorities, Church publications, teachers, and parents giving assurance to all that science blends beautifully with Mormonism? Yes, Virginia, that's the way it was in the thirties when I was a child in northern Utah, and on into the early fifties. That sort of support for science is unknown to today's young Mormons; instead they hear that much of what the schools teach is wrong and they had better not believe it. I'm thankful that my faith wasn't subjected to that test and that I had help with my concerns about whether a scientist could be a Latter-day Saint. Are not today's students and scientists in greater jeopardy of failing to develop strong faith in the Church?

I have watched and pondered science's banishment with astonishment and frustration. It has seemed to run counter to basic Mormon teachings and to the Church's general forward movement.

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With pride I have watched my church come forth "out of obscurity and out of darkness." In my day it has changed from an obscure group in the western states, widely regarded as a cult, to a large and respected international church. And it has moved from darkness into light in many ways, divesting itself of anachronisms and embracing new things found to be "of good report or praiseworthy."

In my ward in New Jersey, several black members, including a seventy, a priest, and a teacher are among our stalwarts. Throughout the Church, women are regularly called on to pray and speak in sacrament meetings. Talks at all levels are now brief and well-prepared instead of lengthy and extemporaneous. People spend less time in meetings and more time at home, where excellent manuals help them enjoy and cement family bonds. Gone are most of the fund-raising activities and the donations of labor for construction. Social services are available to people who have severe personal problems. Public relations expertise and other modern tools help spread the gospel. BYU operates on a higher plane, even teaching and researching philosophy, a subject once taboo. Professional historians write honest Mormon history, aided by their own societies and journals, even though the golden days of apparently official approval now seem to be over.

Nowhere is progress more evident than in the use of technology, the fruit of science. Satellite television takes general conferences to a thousand stake centers. A million rolls of microfilm stored in Granite Mountain vaults preserve and centralize much of the world's genealogical information. Computers minimize work for membership and financial clerks while providing better reports for bishops. Prodigious genealogical databases under construction will someday be researchable from computer terminals everywhere. And what other church creates and distributes sophisticated software for personal computers?

Then there's science.

I have always loved science (by which I mean, mostly, the natural sciences). Perhaps that is because powerful (though not deliberate) forces at home were pushing me toward it from my earliest years. Perhaps those forces were strong partly because of the positive statements about science which some of the General Authorities were making.

Many Mormons today would ignore the science of psychology and say that I must have acquired my taste for science in the preexistence, but it seems to me it happened right in the Bear River Valley. Everyone liked science when I lived there. Long before then, President Brigham Young had established a positive Mormon attitude toward it by preaching that it comes from God and that we should learn all we can about it.

The Reformation, the early global explorations, and the establishment of the United States helped prepare the way for the restoration of the gospel. Over the same period, developments in science and technology came taster and faster until the pace was furious by 1830. President Young saw the Church benefit greatly from the new technology, especially the steam locomotive and the telegraph. He sensed the hand of the Lord in that and made a number of comments to that effect in his sermons: "Where did the knowledge come from which has enabled man to accomplish such great achievements in science and mechanism within the last few years? We know that knowledge is from God" (JD 12:257–58). He would have loved to have studied science in depth: "How gladly would we understand every principle pertaining to science and art, and become thoroughly acquainted with every intricate operation of nature, and with all the chemical changes that are constantly going on around us! How delightful this would be, and what a boundless field of truth and power is open for us to explore!" (JD 9:167)

Praise for science and technology — and to the Lord for revealing them — continued. In their special Centennial address on 6 April 1930, President Heber J. Grant and his counselors reviewed at length "the increase of scientific knowledge, invention, [and] industrial development" which had come about through "light, radiating from the presence of God, illuminating the minds of men, increasing intelligence and knowledge, which is the glory of God, and by the application of which the past one hundred years have been made the Miracle Century of the ages" (CHC 6:562-63).

At that time I was four years old. My mother had the finest flower garden around, and she told me the names of the many species and something about each one. She taught me about insects and birds, and let me see the collections of pressed wild flowers and of minerals which she had made in school.

My father, Clarence E. Smith, was principal of Bear River High. His education in psychology and history meant nothing to me in those childhood years; but his passion for more tangible things, which he had acquired from his father, a blacksmith who had emigrated from Denmark, came across very well. He showed me the special tools in the wood and metal shops and how they were used, the amazing devices in the large physics equipment closets, and the chemistry laboratory with its many bottles of subtances having interesting colors, textures, and odors. My interest in computers had its roots in watching him program the fascinating bell-controlling IBM clock by inserting metal tabs in slots in a revolving drum.

My serious involvement with science dates from one evening when I was seven, as the family returned home after an outing in Logan Canyon. An entire day of close association with both parents was uncommon; not only did Father run a sizeable high school in a rather personal way, but he presided over Bear River Stake with its fourteen (later eighteen!) far-flung wards. Looking up through the windshield, I noticed the stars for the first time in my life, and asked what they were. Father explained the basic facts, which I thought the most interesting information I had ever learned. Right away I was given two nice astronomy books which were about on my level. I pored over them every day, the way we are supposed to study the scriptures. (Years later I heard Father expound on the importance of teaching a child about a matter at the very time he or she shows curiosity about it.)

It wasn't long before I had college astronomy books, a subscription to Sky magazine, a small telescope, and a notebook in which I recorded my observa-

tions. Concurrently my fascination with chemistry grew; and by the time I was ten or twelve, I was doing experiments in the basement and at the high school. (People weren't as safety-conscious in those days as they should have been.) And Father introduced me to the high-school biology teacher; soon, a friend and I were collecting insects. Father went to the wood shop and built a display case.

By the time I entered the University of Utah, high school classes in biology, chemistry, physics, and math had increased my love for those subjects to the point where I approached their study on a higher level with awe and reverence, sensations akin to the strong spiritual feelings some people report having in the temple. The textbooks had far more information in them than I had seen before, all of it interesting, and I could find the names of some of the professors in books and see that they had made important discoveries. Work at the frontiers of knowledge was going on in the laboratories. It thrilled me through and through. I could not have even thought of majoring in a field outside the natural sciences. I chose chemistry.

I knew a fair amount about science and had an unassailable faith in its basic concepts and methods by the time I entered the university; I think that is usual for a science major, based on my observations of other students. If anyone had urged me to test what I was learning against the scriptures, or had told me that one should not seek to understand the origin of the universe or of life on the earth, or had tried to convince me that no creature died on this planet until six thousand years ago, I would have thought that a reason to question the Church, not science. Fortunately, no one was saying such things; instead, two apostles who were respected scientists were preaching the unity of science and true religion. They were the very apostles whose personalities I liked the most.

Four scientists have served as apostles: astronomer, mathematician, and philosopher Orson Pratt (Whittaker 1982; Paul 1982), geologist James E. Talmage (Rowley 1984), chemist John A. Widtsoe, and physicist Joseph F. Merrill. Pratt acquired a fine education on his own; the other three earned doctoral degrees and made solid contributions to science. The terms of the four in the Quorum of the Twelve covered practically the entire period 1835–1952.

I knew of Elders Pratt and Talmage by reputation and by their writings (Talmage died when I was quite young), but Elders Widtsoe and Merrill were around until about the time I completed my formal education. Mother proudly spoke of how she had been taught geology and mineralogy by Talmage, and physics by Merrill, at the University of Utah in 1900–01. It was nice, too, that Elder Richard R. Lyman (after whom I had been named, though we were not related) was a Ph.D. engineer, and therefore almost a scientist. As a child I was privileged to meet these Brethren myself, as they stayed overnight at our home and had Sunday meals with us when their turns came to visit our stake conferences. I wish I had been mature enough to discuss science and religion with them !

The very presence of well-educated and accomplished scientists among the apostles made it easier for me to take the Church seriously. In addition, their

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talks and writings helped with many of my specific concerns. Science students in the Church do face problems, as Widtsoe knew: "The struggle for reconciliation between the contending forces [science and religion] is not an easy one. It cuts deep into the soul and usually leaves scars that ache while life endures" (Widtsoe 1908, preface).

As I see it, the most serious difficulty for Mormon science students is that a testimony of science is gained at an early age, as my personal story illustrates, and it can hinder the development of a testimony of the gospel, which rarely comes until later. A science student needs special help because the Church requires belief in many things which a person with a scientific orientation is more likely to tend to doubt than are other people.

For example, many people are able to take prayer for granted, but a student of science is almost sure to contemplate how it might work. Prayers often are for immediate help; but even if God is only as far away as the nearest star, timely response would seem to require communication at a speed greater than that of light. A communications system would seem to be needed which is unobservable yet in constant contact with every mind and every object; is the universe really filled with the required medium, unknown to scientists? At any given moment, there must be immediate evaluation of every one of the millions of prayers being offered, taking into account righteousness, the needs and prayers of others, and many other factors, and then answers must be formulated and mechanisms to provide them set in motion. Is there really a computer in the sky large and fast enough to handle all of that? Of course prayer might not work that way. Orson Pratt thought that God has no need to listen to us: "If God foreknows all things, he must have foreknown all about our prayers millions of ages before we were born, and must also have foreknown the precise time when we would pray, and the kind of spirit or feeling, and the degree of faith that would accompany each prayer" (Pratt 1849, 31). This idea presents its own difficulties. Does God have no real involvement with my affairs? Do I have genuine free agency? The failure of a bolt or an artery can set into motion a chain of events profoundly affecting the lives of many people. Did God precompute the times and places of all such "accidents" and all their consequences?

Other gospel concepts, such as the reality of the spirit world and the possibility of moving mountains through faith, present similar problems. Then there is the fact that the Church teaches that a testimony of the reality of unseen things can be gained only by methods foreign to science. Surely most Mormon science students are tempted, at times, to lighten ship and reject so much baggage, especially since it is in the spirit of science to seek simple models using generally accepted methods.

Further questions arise in connection with the descriptions given in the scriptures of ancient events. Few science-oriented people are able to believe that the earth is very young, that evolution played no role in the creation of species, that the earth stopped rotating for a while in Joshua's day, that Noah took two of every kind aboard the ark, or that the flood covered the entire earth. Other Bible-believing churches have faced these problems and resolved them in various ways; but for Mormons, there is the added complication that the modern scriptures seem to reinforce some of the most troublesome biblical passages.

The modern scriptures also contain statements about the universe which are unique to Mormonism and which need to be pointed out to Mormon science students and discussed. Do they fit in with science, or do they present further problems? I am thinking especially of physics in the Doctrine and Covenants and astronomy in the book of Abraham.

I became interested in the science-religion relationship while in my teens, a time of great increase in my awareness of the teachings of the Church. I soon learned that Elder Widtsoe was active in seeking to help people feel comfortable in this area. He published numerous articles in the *Improvement Era* and elsewhere throughout the entire first half of this century, many of which dealt with science.

In his Joseph Smith as Scientist, based on early Era articles, Widtsoe explained that he saw opportunities, not problems, in the science in our scriptures and he argued that the Prophet had anticipated many of the findings of modern science. He said that "there is no real difference between science and religion. The great, fundamental laws of the Universe are foundation stones in religion as well as in science" (Widtsoe 1908, preface). He accepted evolution within limits, not claiming any knowledge of just what those limits are, and he had no problem with a great age for the earth.

In his *Evidences and Reconciliations* books, based on later *Era* articles, Widtsoe explained that the earth did not necessarily pause in its rotation for

Joshua; it would have been easier for the Lord to have created the illusion that the sun stopped. As for Noah's flood, he thought it "doubtful whether the water in the sky and all the oceans would suffice to cover the earth so completely" as to inundate all mountain peaks. But water could have covered the earth anyway, in keeping with the Mormon concept that the flood was the earth's baptism, if there was a general downpour; "on sloping hillsides, it might have been only a fraction of an inch in depth" (Widtsoe 1943, 1:109–11).

In Joseph Smith as Scientist, Widtsoe argued that the concept of a spacefilling ether is found in the Doctrine and Covenants, which he thought tended to confirm that Smith was a prophet, but by the time I came along science had abandoned the ether. That didn't bother me, though; I knew that reinterpretation is a way of life for seekers of truth. Widtsoe's writings included provisional theories of his own, and one would expect some of them to turn out to be wrong. What was important to me was that Widtsoe, with his fine credentials both in science and in the Church, believed science to be part of Mormonism and tried to help science students stay with the Church by showing them how they could believe as he did.

Elder Merrill also was helpful, but in a different way. In his 1945 radio talks he described, in his uncommonly friendly style, some of the wonders of the universe which had been discovered by physicists and astronomers, and then he talked about how thrilled he was to see support for the existence of God in those wonders (Merrill 1945). And he quoted famous scientists to show that they believed in God. As my studies broadened I learned that many scientists and philosophers could not see God in nature, and that not all scientists believed in God. Perhaps it is a matter of the uneven dispensing of gifts by God for reasons that only he understands. However that may be, it was good to know that Merrill, intimately familiar with both Mormonism and science, considered science to fit in well with Mormonism.

Perhaps illustrating my remark that a science student is likely to have extra difficulty gaining a testimony, Merrill stated in his final radio talk that beginning at age ten he had prayed daily for *nine years* for a testimony that God lives, before receiving an answer. He wondered if unworthiness had stood in the way, but we have two reasons to suppose that he was at least as worthy as most young people — he did all that praying, and he later became an apostle.

Further confirmation that Mormonism and science go hand in hand was provided by scientists who were not Church leaders, such as Frederick J. Pack, a University of Utah geology professor. Father owned Pack's book *Science and Belief in God* (1924); and when I was in my teens, he suggested that I read it. It helped with some of the problems I have mentioned. For example, Pack reviewed the reasons for wondering if the flood really covered the entire earth and concluded by doubting that it did. He showed to my satisfaction that Noah could not possibly have taken two animals of every kind aboard the ark. For one thing, creatures are *still* being discovered by scientific expeditions how could Noah have found them all in a short time? But Pack made it clear that his basic faith in the Bible was unshaken. I was happy to learn that I could be flexible in my understanding of some of the troublesome ancient stories, and still be a good Latter-day Saint.

In addition to all the helpful books and articles by Widtsoe, Merrill, Pack, and others, there was a monthly column in the *Era* called "Exploring the Universe" by Franklin S. Harris, Jr., a University of Utah physics professor. It highlighted new developments in science and technology and, therefore, the Church's interest in them.

While a soldier in Japan in 1946, I learned of Henry Eyring's move from Princeton to Utah, found a chapter by him in the library, and decided to do my graduate work with him; he was a theoretical chemist, and I considered theory to be the best part of science. A devout Mormon and a respected scientist (E. Kimball 1973, 1982), he helped me with my worries about science and religion from the time I entered graduate school until the end of his life. He gave many other people the benefit of his wisdom through his talks and articles in Church magazines.

Eyring did not try to get science and Mormonism to mesh in detail, but pretty much kept them in separate compartments, believing that science is revealed through scientists, not prophets. To Elder Richard L. Evans he wrote: "I never worry what the Brethren believe about my specialty today because it is part of the genius of the Lord's Church that both they and I will understand the entire situation better tomorrow" (Eyring 1954). I shared Widtsoe's desire to merge science and Mormonism, so at first I had difficulty accepting Eyring's philosophy. Eventually I came to see much wisdom in it, as I learned (partly through the fate of Widtsoe's chapter on the ether) that one must not take too seriously any very specific ideas as to how Mormonism and science fit together.

Although Widtsoe, Eyring, and other Church scientists differed in their styles, they preached the same basic message: Science is a part of Mormonism. I began postdoctoral work at Harvard thoroughly imbued with that philosophy.

At Cambridge I found a remarkably talented group of Mormons. Branch President Melvin Herlin was a physics professor at MIT. The students, who represented many specialties, broadened my outlook; they taught me to see their disciplines, too, as dovetailing with Mormonism. A good number of them, building on that belief, went on to make distinguished careers for themselves while remaining true to the Church: Richard Anderson, Carlfred Broderick, Richard Bushman, Mark Cannon, Chase Peterson, and others.

One week Hugh Nibley visited our branch. I sat spellbound as he made me aware that the Book of Mormon is a gold mine, loaded with rich nuggets waiting to be picked up and analyzed, and that every talent is needed. Perhaps I could make a contribution! Is there science in the Book of Mormon? The Nephite monetary system caught my eye. I found that it was based on the binary number system, and in the library I learned that the Egyptians had used that system in their mathematics. In basing their monetary system on it the Nephites had modified it, probably to minimize the number of coins needed for transactions, in exactly the way that the manufacturer of the sortable cards on which I kept my literature references had modified it to minimize the work of sorting out the cards in a given category. It was exhilarating to become actively involved with the science-Mormonism connection, adding a thread to it myself, and I gained a sense that a great many other points of contact await our discovery and investigation. I was more convinced than ever before that the marriage of science and Mormonism, which already was good, could only get better and better.

I was in for a big surprise. It came in 1954, just when I began teaching science, and just when the publication of my little contribution (R. P. Smith 1954) had my optimism soaring at new heights.

Elders Widtsoe and Merrill both died in 1952. Two years later, President Joseph Fielding Smith of the Council of the Twelve published *Man: His Origin and Destiny*. I read the book with considerable discomfort; according to it, much of science is quite apart from Mormonism.

President Smith felt that "Satan dominates the thinking of the world today" (p. 319). He saw that domination in several areas of science, but most of all in biology. Satan, he said, authored the theory of evolution, which is "the most pernicious doctrine ever entering the mind of man" (p. 133) and "Satan's chief weapon in this dispensation in his attempt to destroy the divine mission of Jesus Christ" (p. 184). I didn't understand that; what did the truth or falsity of evolution have to do with whether the gospel was true? And I knew that many good people believed in evolution, including Eyring, whose thinking coincided with mine: "Organic evolution is the honest result of capable people trying to explain the evidence to the best of their ability. From my limited study of the subject I would say that the physical evidence supporting the theory is considerable from a scientific viewpoint" (Eyring 1983, 61).

It seemed to me, as it had to Widtsoe, that there must be evolution at least within some limits. I was willing to believe that the Lord guided it, but in my youth I learned, as I collected butterflies, that different species often are so much alike that they cry out to be seen as distant cousins. As a chemist, I thought it unlikely that the fundamental reproductive processes could be perfectly protected from ever going astray a little bit; mutations seemed inevitable. And I could not easily disbelieve all the evidences for evolution which I read about regularly in *Scientific American* and elsewhere, including direct laboratory observations.

Apparently President Smith objected to evolution mostly for reasons I still can't quite grasp; he just knew that the Lord didn't work that way. In addition, he flatly repudiated evolution by asserting that the earth is only a few thousand years old (Ch. 24) and that there was no death for any creature prior to Adam's fall (p. 362). President Smith ignored the existence of fossils over 6000 years old, commenting only on skeletons in the closet, such as the Piltdown hoax. Posing another problem for biologists, he asserted that prior to the fall, Adam had no blood in his veins (p. 362).

He also denied a widely held astronomical theory which Widtsoe had accepted, insisting that stars never "become dead cold bodies" because the

Lord "does not create anything to be destroyed" (pp. 272-73). He was sure that the earth really did pause in its rotation in Joshua's day; after all, it will literally "reel to and fro as a drunkard" in the last days (p. 12). He quoted and condemned Pack's ideas on the flood (pp. 414-15).

The names Talmage, Widtsoe, and Merrill were not in the exhaustive index; the only entries under *scientists* were "claim Bible a myth," "faith in scriptures weakened by," "false concepts of God of," "reject fall and atonement," "revelations attacked by," and "will formulate false theories as long as they ignore the Divine Creator."

Through long study and reflection and with the encouragement of apostles and scientists, I had come to see some flexibility in the interpretation of the scriptures as both permissible and necessary, especially regarding such prehistoric events as the creation and the flood. President Smith was denying that flexibility, and what he was saying would have required a drastic turnabout in my thinking which I felt I would be unable to make.

I was bothered not only by President Smith's rejection of science, but by his implied rejection of teachings of past Church leaders as well. President Young hadn't taken the writings of Moses so seriously:

How long it [the earth] has been organized is not for me to say, and I do not care anything about it. As for the Bible account of the creation we may say that the Lord gave it to Moses, or rather Moses obtained the history and traditions of the fathers, and from them picked out what he considered necessary, and that account has been handed down from age to age, and we have got it, no matter whether it is correct or not, and whether the Lord found the earth empty or void, whether he made it out of nothing or out of the rude elements; or whether he made it in six days or in as many millions of years, is and will remain a matter of speculation in the minds of men unless he give revelation on the subject (JD 14:115-17).

I liked that statement. Couldn't I stick with it, and with some things I had learned from Widtsoe which President Smith evidently saw as false doctrine? But it bothered me to have to ignore precepts which the living president of the Quorum of the Twelve felt so strongly that I must believe. I asked Eyring, who seemed never to worry, how he handled that problem. As usual, his reply was both witty and pithy: "Maybe it will turn out that everything Joseph Fielding Smith ever said was exactly right, and maybe when I go to be judged he'll be delegated to judge me. I'll just say, 'I'm sorry I was wrong. Now let's get this over with as quickly as possible!' "

In my innocence I finally concluded that despite President Smith's high position, the publication of his book was an aberration which was not to be taken seriously. His views seemed to make little sense, and I figured that he must not have much support in them, as no one had said such things before. While Eyring sprang into action, defending science and scientists in talks and correspondence with Smith and other Church leaders (Heath 1982), I thought everything would soon be smoothed over and forgotten.

I was wrong again.

Man: His Origin and Destiny has not often been quoted in Church literature, perhaps owing to the protests made not only by Eyring, but by many other scientists as well. Probably the majority of today's members have not read it, although many of them are familiar with its concepts through Bruce R. McConkie's extensive quotations from it in *Mormon Doctrine* and elsewhere. Nevertheless, as Duane Jeffery said in 1973, it "sparked a wave of religious fundamentalism that shows little sign of abatement." That wave continues unabated today.

President Smith said little more about science during his lifetime, but other General Authorities proceeded to warn against evolution and to preach an earth history which most scientists find untenable. Their warnings and teachings have issued forth under increasingly impressive circumstances right down to the present time.

Even more disconcerting to me has been the lengthy and continuing silence which the remaining General Authorities have maintained. Encompassing virtually all branches of science, it has worked in concert with the warnings to create the impression that all the Brethren are uncomfortable with science. And it is a rare day when a Church publication has anything good to say about science or scientists, a notable exception being a 1984 *Ensign* article on James Fletcher (Van Atta 1984). It is usually in vain that I watch for some praise for science, for some attempts to show that science and Mormonism can be reconciled, and for some use of the wonders discovered by science (and a great many marvelous things have been discovered since Merrill's day) to promote faith. No one is growing up in the Bear River Valley today with the advantages I had.

The change has surprised me partly because when I read Man: His Origin and Destiny, I thought of it as an isolated bolt out of the blue, not knowing that evolution and related topics had long been vigorously debated by some of the General Authorities. Enlightenment came years later when I was able to read interesting essays by Duane Jeffery, Richard Sherlock, and Jeffrey Keller, where I learned, among other things, that President Smith had been pitted against Elders Talmage and B. H. Roberts in arguments mediated by the First Presidency and the Quorum of the Twelve, and that Man was based on an old manuscript which had long been held up, apparently due in part to opposition from Elders Widtsoe and Merrill (Jeffery 1973; Sherlock 1980; Keller 1982).

I did know that at least a few General Authorities supported President Smith; he noted in his preface that Elders Mark E. Petersen, Marion G. Romney, Milton R. Hunter, and Bruce R. McConkie had given him "encouragement and help." But still it surprised me when two of those four became ardent antiscience spokesmen; I guess I had just wanted to put that possibility out of my mind.

Elder Petersen, who wrote the foreword, sniped away at science from time to time through his *Church News* editorials for the remainder of his life. He particularly objected to efforts to understand the origins of the universe, of the earth, and of species, as well as to the theories which have resulted from those researches: "No worm or similar lower form of life could, by accident or otherwise, evolve into such an intricate pattern as bird-life. No attempt at reason or research or hypothesis can provide the answer — only the divine creation" (1 Sept. 1979). "We need no longer speculate as to the origin of life or the manner by which the earth and the heavens were created" (20 Dec. 1980). Regarding the "big bang" theory of the origin of the universe: "Did explosions ever bring order out of chaos, or do they produce chaos?" (17 Oct. 1981). One wonders if he really supposed the astronomers hadn't thought of that.

Some of Elder Peterson's editorials made me feel rather uncomfortable. He made scientists out to be quite foolish, or at times even possibly evil. He was not in favor of some scientific activities which I and most scientists considered legitimate. And he seemed to be telling me that I should rid myself of some of my strong beliefs.

The views on evolution and related topics which Elder McConkie held are well known because of their prominence in *Mormon Doctrine*, an immensely popular book ever since its first publication. He completely dismissed all findings of science which seemed to conflict with what he saw in "the inspired word." In so doing, he did not even comment on the obvious questions which are thereby raised. He was especially persistent in teaching that it is a "revealed truth that there was no death either for man or animals or plants or any form of life until some 6000 years ago when Adam fell" (McConkie 1958, 613–14). That statement requires disbelief in thousands of findings of science; I doubt that very many Mormon science students were or will be persuaded to reject so much evidence. How about all the ancient fossils of myriads of species of living things? Isn't coal derived from ancient vegetation?

Mormon Doctrine is not Church-published, and presumably the Church News editorials did not speak for the Church. But in 1979, assertions with which most scientists would disagree appeared in places having more status. Sherlock pointed out that the denial that there was death for any creature prior to the fall appears under "death" in the Bible Dictionary which, though unofficial, keeps good company — it is bound with the 1979 Bible; and that some antievolution quotations from the writings of President Joseph Fielding Smith were published that year in a priesthood manual and in a Sunday School manual. The Sunday School manual was used again in 1985.

In June 1982, Elder McConkie's views on the creation and the fall moved up to the *Ensign*, giving them very wide distribution and at least the appearance, to many, of still higher status (McConkie 1982). He prefaced them with the remark that "an understanding of the doctrine of creation is essential to salvation" and concluded that "we are duty bound to accept" the "revealed verities" he outlined. He explicitly dismissed evolution and taught that there was neither reproduction nor death for any species until after Adam's fall. (Didn't baby dinosaurs grow into egg-laying adult dinosaurs?) Again we can presume a lack of official standing; only the prophet can confer that. But perhaps many Mormons have assumed, and more will yet assume, that when Elder McConkie made strong assertions in the *Ensign*, he spoke for the Church.

Further escalation came at the October 1984 General Conference, through the words of two senior apostles — one apostle at each of the Sunday sessions (McConkie 1984; Packer 1984). The addresses reached an audience of unprecedented size, thanks to all the scientists and engineers who gave us satellite television and to the Church for being so modern as to use it on a large scale, but the science-related remarks were not modern. All the Brethren were seated behind the speakers, their presence seeming to underline the assertions which were made.

Using homey examples (chicks don't grow up to become horses or dogs), Elder Boyd K. Packer stressed that "the pattern for all life is the pattern of the parentage," a statement with which any biologist would agree, except that he seemed to mean it in an absolute sense and to be using it as an argument against evolution, following a pattern laid down by President Smith and Elder Petersen. He made clear his distaste for evolution by adding that "surely no one with reverence for God could believe that His children evolved from slime or from reptiles." He concluded with an enigmatic statement: "The theory of evolution, and it is a theory, will have an entirely different dimension when the workings of God in creation are fully revealed." I hope, as I imagine most religious biologists do, that he meant that the theory will survive, but that it will be purified and expanded, allowing ever more clearly for the workings of God.

Elder McConkie's remarks were, as usual, unambiguous. In the course of outlining "some simple tests that all of us may take to determine if we are true to the faith," he said that "true believers know that this earth and man and all forms of life were created in an Edenic, or paradisiacal, state in which there was no mortality, no procreation, no death" — a state which ended only when Adam fell. By definition, then, anyone who believes that plants and animals were reproducing and dying millions of years ago is not a true believer.

Statements which are less than friendly to science have not been concerned solely with evolution and allied themes. A lesson for priests covered much more territory. It warned the youths to test "the theories of men against the truths of the gospel, not the other way around," to "beware of false science," and that "to be learned is good only [!] if we hearken to the council [*sic*] of God"— a bit of neo-Nephi which I do hope no one really believes (Priests Study Course, 1973).

While some findings of science are condemned by some General Authorities, many other findings are just widely ignored. I have already alluded to a widespread tendency to assume that personality traits originate in the preexistence rather than in early life; at a recent stake conference, I heard a high local leader cite the personality differences among his children as proof of the preexistence. Another example: It was preached at a general conference, and then repeated to the teachers quorums for several years, that a smoker who doesn't quit will go to the spirit world plagued by a craving for tobacco, because it really is the *spirit* that is addicted (Teachers Study Course, 1970). Those youths knowing it to be a solid scientific fact that a craving for tobacco expresses addiction of the body to nicotine might have wondered if they really had to believe all the other teachings in their manual.

What will happen next, and what can we do?

Since Mormonism and science are both basically true they will converge eventually, and then an even more benevolent attitude toward science than I knew in my youth will prevail in the Church. At present, though, I feel great concern as I see movement in the wrong direction from time to time and none in the right direction.

From 1954 until 1982 I dismissed, with some effort, the antiscience statements, assuming them to express only the personal opinions of a few General Authorities who were not following a 1931 First Presidency directive to General Authorities: "Leave Geology, Biology, Archaeology, and Anthropology, no one of which has to do with the salvation of the souls of mankind, to scientific research, while we magnify our calling in the realm of the Church" (Jeffery 1973, 64). What seriously concerned me then was the lack of a supportive climate for Mormons interested in science. That concern continues, but now there is a new worry — the teachings which I dismissed have appeared in the *Ensign* and have been preached in a general conference. That raises the possibility that the General Authorities now unitedly approve them. It may be that the resurrection of the benevolent attitude toward science which I once knew will not occur soon.

How are today's Mormon science students getting by without sciencereligion reconciliations? Wouldn't it help them to be shown, in a religious setting, some of the wonders of the universe? Isn't it still a part of Mormon thought that "the heavens [and other natural wonders] declare the glory of God"? Shouldn't something be said in praise of science now and then, as Presidents Young and Grant did? Wouldn't that help science students (and older scientists, too) feel good about themselves and the Church?

Instead, a young person today learns in school of the thousands of researches proving that life, death, and reproduction have been going on for millions of years on this planet while learning that "the Church" (as he or she is likely to perceive it) teaches otherwise. How that must strain the faith of many!

What can those of us do who are friendly to science? For one thing, we can follow Eyring's example, explaining science and speaking and writing positively about it for Mormon audiences. *Reflections of a Scientist*, a masterful compilation of some of Henry Eyring's thought, will have much influence for good (Eyring 1983).

Discussions of Mormonism and science too often revolve about evolution and the age of the earth. Those topics are important, and scientists with expertise in the relevant areas should continue working for a more enlightened attitude. At the same time, I would like to see more discussion of other areas of science where fewer people firmly hold to unreasonable positions. There are many areas where the risk of polarization is small and therefore the chance of doing good is great.

Modern technology could be discussed more to good advantage. The Church has always been comfortable with it, and we could show how technology is based on science. The Prophet Joseph Smith and his highest associates in the Church traveled from Utica to Schenectady by rail 29 July 1836 on one of America's first railroads (HC 2:463), even before its inaugural run on 1 Aug. 1836 (Stevens 1926, 125). Did the Lord arrange that trip to symbolize

the fact that he was making modern technology available for the sake of the Church? The transcontinental railroad and telegraph were both completed in Utah, in time to be of great help to the Church, and so on with the automobile, air transportation, radio, television, the satellite, and the computer.

The Lord guided Luther, Columbus, and those who brought into being the United States government, according to Mormon teachings. A large part of his reason for doing so was to prepare the way for the Church. Did he likewise guide the development of technology? Presidents Young and Grant thought so, as I have shown, and in 1975 President Spencer W. Kimball went further: "The telephone and telegraph and other such conveniences were permitted by the Lord to be developed for the express purpose of building the kingdom. Others may use them for business, professional or other purposes, but basically they are to build the kingdom" (S. Kimball 1975). There is much interesting material along these lines for us to research and to speak and write about.

The guidance of pure science by the Lord is another exciting Mormon concept which provides a natural framework within which to discuss science. For example, I think it thrilling to contemplate the enormous body of astronomical knowledge we have in connection with a statement the Lord made to the Prophet Joseph Smith in 1839. At that time, astronomers were just beginning to reach beyond the solar system and were discovering the very first facts about the stars --- determining their distances from their relative apparent motions. To the Prophet in the Liberty jail the Lord said, referring to the sun, moon, and stars: "All the times of their revolutions, all the appointed days, months, and years, and all the days of their days, months, and years, and all their glories, laws, and set times, shall be revealed in the days of the dispensation of the fulness of times" (DC 121:31). Widtsoe pointed out that this revelation is remarkable in that it was given "many years before the fact that all celestial bodies are in motion was understood and accepted by the world of science" (Widtsoe 1908, 47-48). Frank Salisbury further noted that "now is the dispensation of the fulness of times" and that "many of the things the Lord promised to reveal have already been discovered by modern astronomers" (Salisbury 1976, 151). It is overwhelming to read a modern overview of astronomy, such as Asimov's The Universe (1980) and get a glimpse of the universe as scientists now know it. Only scientists are able to ask the right questions and understand the answers. And the Lord must have guided the astronomers; he knew what would happen.

I have given only two examples of the many marvelous resources, unique to Mormonism, which we can use to show the rising generation of science students (and our present and future leaders!) that science mixes well with Mormonism — better, probably, than with any other religion. It is up to us to teach our convictions to as many people in the Church as we can, from young students on up through General Authorities. Everyone needs to know that science really is part of Mormonism, and that the Lord works through both prophets and scientists. All those good people in the Bear River Valley knew those facts when I was young. It saddens me that their grandchildren do not. We must do all we can to change that.

BIBLIOGRAPHY

Asimov, Isaac. The Universe [3rd ed., rev.] New York: Walker and Company, 1980.

CHC. Roberts, B. H. A Comprehensive History of the Church of Jesus Christ of Latter-day Saints, 6 vols. Salt Lake City: Deseret News Press, 1930.

Eyring, Henry to Richard L. Evans. 8 Apr. 1954. Copy in my possession.

- ------. Reflections of a Scientist [ed. Harden Romney Eyring]. Salt Lake City: Deseret Book, 1983.
- HC. Smith, Joseph, Jr. History of the Church of Jesus Christ of Latter-day Saints. Ed. by
 B. H. Roberts. 2nd ed. rev. 7 vols. Salt Lake City: Deseret Book, 1948.
- Heath, Steven H. "The Reconciliation of Faith and Science: Henry Eyring's Achievement." DIALOGUE 15 (Autumn 1982): 87-99.
- JD. Journal of Discourses, 26 vols. Liverpool: LDS Book Depot, 1855-86.
- Jeffery, Duane E. "Seers, Savants and Evolution: The Uncomfortable Interface." DIA-LOGUE 8 (Autumn/Winter 1973): 41-75.
- Keller, Jeffrey E. "Discussion Continued: The Sequel to the Roberts/Smith/Talmage Affair." DIALOGUE 15 (Spring 1982): 79–98.
- Kimball, Edward L. "A Dialogue with Henry Eyring." DIALOGUE 8 (Autumn/Winter 1973): 99–108.
 - ———. "Harvey Fletcher and Henry Eyring: Men of Faith and Science." DIALOGUE 15 (Autumn 1982): 74–86.
- Kimball, Spencer W. Address delivered at Regional Representatives Seminar, 3 April 1975 [p. 19]. Quoted in *Teaching: No Greater Call* [p. 89]. Salt Lake City: The Church of Jesus Christ of Latter-day Saints, 1978.

McConkie, Bruce R. Mormon Doctrine [1st edition]. Salt Lake City: Bookcraft, 1958.

- ------. "Christ and the Creation." Ensign 12 (June 1982): 9-15.
- -----. "The Caravan Moves On." Ensign 14 (Nov. 1984): 82-85.
- Merrill, Joseph F. The Truth-Seeker and Mormonism. Salt Lake City: A Series of Radio Talks, delivered Sunday evenings, July 1st to December 30th, inclusive, Radio Station KSL, 1945.
- Pack, Frederick J. Science and Belief in God. Salt Lake City: Deseret News, 1924.
- Packer, Boyd K. "The Pattern of Our Parentage." Ensign 14 (Nov. 1984): 66-69.
- Paul, E. Robert. "Early Mormon Intellectuals: Parley P. and Orson Pratt, a Response." DIALOGUE 15 (Autumn 1982): 42-48.
- Pratt, Orson. Absurdities of Immaterialism, or, A Reply to T. W. P. Taylder's Pamphlet, entitled, "The Materialism of the Mormons or Latter-day Saints, Examined and Exposed." Liverpool: R. James, 31 July 1849.
- Priests Study Course, Series B. Salt Lake City: The Church of Jesus Christ of Latter-day Saints, 1973.
- Rowley, Dennis. "Inner Dialogue: James Talmage's Choice of Science as a Career, 1876– 84." DIALOGUE 17 (Summer 1984): 112–30.
- Salisbury, Frank B. The Creation. Salt Lake City: Deseret Book, 1976.
- Sherlock, Richard. "'We Can See No Advantage to a Continuation of the Discussion:' The Roberts/Smith/Talmage Affair." DIALOGUE 13 (Fall 1980): 63-78.
- Smith, Joseph Fielding. Man: His Origin and Destiny. Salt Lake City: Deseret Book, 1954.
- Smith, Richard Pearson. "The Nephite Monetary System." Improvement Era (May 1954): 316-17.
- Stevens, Frank W. The Beginnings of the New York Central Railroad: A History. New York: G. P. Putnam's Sons, 1926.

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- Teachers Study Course, Series B. Salt Lake City: The Church of Jesus Christ of Latter-day Saints, 1973. On p. 44 Hartman Rector, Jr. is quoted, from Conference Report, Oct. 1970, pp. 73-74.
- Van Atta, Dale. "James C. Fletcher: Knowledge Lights the Way." Ensign (Apr. 1984): 26-31.
- Whittaker, David J. "Orson Pratt: Prolific Pamphleteer." DIALOGUE 15 (Autumn 1982): 27-41.
- Widtsoe, John A. Evidences and Reconciliations: Aids to Faith in a Modern Day, 3 vols. Salt Lake City: Bookcraft, 1943-51.

