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## Guest Columnist: Science, religion and blessing the sun

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howard smith , THE JERUSALEM POST

There is a revolution under way over how we think about science and religion, one that should matter to every person - religious or secular - who cares about intellectual honesty or spiritual wholeness. My recent op-ed, "[Blessing the sun: Astronomical absurdity or spiritual encounter?](#)" (April 6) hinted at this development. That article generated considerable e-mail, some to *The Jerusalem Post* and some directly to me, which the *Post* asked me to address.

As I write these remarks, we are preparing for Shavuot, the traditional season of revelation - surely the ultimate challenge to intellectual complacency, which is what this subject is all about. I will return to the theme of revelation at the end.

Nearly all of the letters were complimentary (thank you for them), but they came with questions and issues that tended to fall into two opposite flavors. Writers who identified themselves as religious wondered why I could be so sure that science was correct about things like the age of the universe, or how I could myself be a religious Jew if Torah were being challenged. Writers who were secular, or atheistic, wondered what religion had to offer, and why I bothered keeping rituals like the Birkat Hahama - or even Pessah.

These are familiar, I might say even old-fashioned, objections. My book, *Let There Be Light: Modern Cosmology and Kabbalah, a New Conversation Between Science and Religion*, reviews and explicates all the issues in detail. In the next few paragraphs I will respond to both sides, and answer a few technical questions that were raised several times.

I need to begin, however, with some information that is important to both perspectives. I said that there is a revolution under way in how we think about science and religion. It is because of this: the "god of the gaps," that quasi-derogatory term used to describe a divinity invoked whenever we do not understand something - that god is now dead. In just the past 20 years or so - not earlier - science has been able to answer with some confidence all of the fundamental questions that used to be the sole domain of religion, especially the two big ones: How was the universe created? What is the nature of life?

In physics and astrophysics, the "big bang" model has been soundly confirmed and other options rejected by recent satellites and telescopes designed explicitly to look for loopholes. Just last week the European Space Agency launched the Planck satellite, the latest in a series to study the big bang; it is expected to achieve astonishing accuracies of 1 percent in its measurements of the details of the creation. In biology, the Human Genome Project has successfully placed life and its complexity under a microscope.

THESE EXAMPLES by no means imply that we know everything. On the contrary, the mysteries increase in number as our questions become more sophisticated. But I do mean to say that the scientific method has every reason to expect success in answering the new questions too, and no reason to be worried about the need to invoke some opaque "god of the gaps" when it gets stuck. Even 50 years ago this was not the case. A revolution is upon us.

All this means that for the very first time in human history we can plausibly, if timorously, respond, "Yes," on

behalf of Job, whom God challenges: "Speak up if you can understand [the creation]!" - Job 38:4. For those of us who are religious, this revolution means that our faith is not the result of being ignorant, but an acknowledgment of a sanctified relationship. For those of us who recognize the truth of science, it means that although our knowledge of the world is intellectual, our relationship with the world can be clarified by a Torah thankfully freed from the distracting baggage of supposedly offering physical "answers." God is not a "god of the gaps," but the One who took us out of Egypt.

The celebration of Birkat Hahama was an opportunity to confront this modern renewal of spirit: to give thanks for our blessings, and to express our consciousness of the natural world. It was also a moment to consider how the rabbis, at least in this case, dealt with matters of science.

Birkat Hahama celebrates the sun when it appears at dawn at the spring equinox - that is, when the length of the day is equal to that of the night (i.e., 12 hours each; there is also an equinox that occurs in the fall.) This year the spring equinox occurred on March 20. If you were to look down at the solar system from above and ask how long it takes for the earth to orbit around the sun and return to exactly the same position with respect to the stars, the answer is one "sidereal year" of 365.256363 days. But because the varying length of days - like the seasons - is caused by the tilt of the earth's axis (the axis does not point straight up from the plane of the orbit), and because that axis wobbles ("precesses") slightly, the time to go from one spring equinox to another is called a "tropical year" and is shorter than the sidereal year: It is only 365.24219 days. The tropical year is what the rabbis calculated, since they were interested in the spring equinox.

The 19-year calendar cycle that we as Jews use is based on the calculations of Rabbi Adda bar Abba, who used a tropical year of 365.2468 days. It is not a bad estimate, but since it differs slightly from the actual tropical year length, Passover is slowly drifting away from spring. It was precisely for this kind of reason that in 1582 Pope Gregory instituted a change in the secular calendar, which, together with one later adjustment, makes the current secular calendar nearly perfect. But the rabbis of the time did not want to emulate this correction, and retained the old calculations.

The calendar for calculating Birkat Hahama, however, used an even more approximate number for a year, that of Rav Shmuel - exactly 365.250 days - perhaps because it was simpler for people to use. He certainly knew this value was not perfectly accurate; Hipparchos in 200 BCE knew about the precession, and estimated its effects.

So: even if the sun had been created on a Wednesday spring equinox, the occasion would not always coincide with the officially calculated date from Rav Shmuel. But nonetheless the calendar was ruled good enough.

An exact correspondence was unnecessary for the rabbis, perhaps because the event is only symbolic. Just so.

TODAY WE KNOW the universe is 13.7 billion years old, and the sun was not created on a Wednesday in the spring 5769 years ago. Many completely independent lines of evidence confirm it; good explanations can be found in many sources (including my book). The more commonly posed question from fundamentalists is: How do we know that God did not actually create the world a few thousand years ago to appear to be billions of years old?

The most effective answer to this question depends on knowing the questioner, but, in brief, I often point to the proof offered by Maimonides: We are commanded by Torah to love and know God, and thereby we are assured that it is possible. He does not play tricks with us, or with that most precious and distinguishing human faculty, our intellect.

Shavuot celebrates the occasion of the revelation at Sinai some 3,500 years ago (sorry for the typo in the earlier article). Doesn't the idea of revelation and divine intervention require a person to take sides, either for science or religion? No. It seems to me that, at least in a traditional Jewish sense, in fact the opposite is the case. The midrash puts it effectively when describing the episode at Sinai. It reports the opinions of Rabbi Tanhuma, Rabbi Jose ben Rabbi Hanina, Rav Kahana and others that every person at Sinai heard something different. "To each person it was according to his strength," they said. "The divine word spoke to each and every person according to his particular capacity."

The power of the scientific method is that every person will see and hear exactly the same thing. Mistakes of

interpretation will therefore be found and fixed; cumulative wisdom grows, and as it does, we gain in understanding about God's "Book of Nature." But the power of revelation is that no two people will see and hear exactly the same thing. Our relationship with the holy is a personal and sanctified one. Taken together, these two - our mind and our spirit, our shared and our personal experiences of the divine - enable us to live in the natural world both aware of and grateful for its blessings, the sun included.

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