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“Nature and Wonder: A Reconnaissance of Heaven”, by Carl Sagan

The word “religion” comes from the Latin for “binding together,” to connect to that which has been sundered apart. It’s a very interesting concept and in this sense of seeking the deepest interrelationships among things that superficially appear to be sundered, the objectives of religion and science, I believe, are identical or very nearly so. But the question has to do with the reliability of the truths claimed by the two fields and the methods of approach.

By far the best way I know to engage the religious sensibility, the sense of awe, is to look up on a clear night. I believe that it is very difficult to know who we are until we understand where and when we are. I think everyone in every culture has felt a sense of awe and wonder looking at the sky. This is reflected throughout the world in both science and literature. Thomas Carlyle said that wonder is the basis of worship. And Albert Einstein said, “I maintain that the cosmic religion feeling is the strongest and noblest motive for scientific research.” So if both Carlyle and Einstein could agree on something, it has a modest possibility of even being right.

There are a vast number of stars within our galaxy. [...] It’s about 400 billion stars, of which the Sun is one.

[...] Where would the sun be? Would it be in the center of the galaxy where things are clearly important, or at least well lit? The answer is no. We would be somewhere out in the galactic boondocks, the extreme suburbs, where the action isn’t. We are situated in a very unremarkable, unprepossessing location in this great Milky Way Galaxy. But of course, it is not the only galaxy. Very many galaxies, a very large number of galaxies.... (In fact, there are more galaxies in the universe than stars within the Milky Way galaxy.) ...The number of external galaxies beyond the Milky Way is at least in the thousands of millions; perhaps in the hundreds of thousands of millions, each of which contains a number of stars more or less comparable to that in our own galaxy. So if you multiply out how many stars that means [...] it’s something like one followed by twenty-three zeros, of which our sun is but one. It is a useful calibration of our place in the universe. And this vast number of worlds, the enormous scale of the universe, in my view has been taken into account, even superficially, in virtually no religion, and especially no

### Western religions.

Many religions have attempted to make statues of their gods very large, and the idea, I suppose, is to make us feel small. But if that's their purpose, they can keep their paltry icons. We need only look up if we wish to feel small. [...] Edward Young, in the 18th century, said, "An undevout astronomer is mad," from which I suppose it is essential that we all declare our devotion at risk of being adjudged mad. But devotion to what?

All that we have seen is something of a vast and intricate and lovely universe. [...] There is no particular theological conclusion that comes out of an exercise such as the one we have just gone through. What is more, when we understand something of the astronomical dynamics, the evolution of worlds, we recognize that worlds are born and worlds die, they have lifetimes just as humans do, and therefore that there is a great deal of suffering and death in the Cosmos if there is a great deal of life. For example, we talked about stars in the late stages of their evolution. We've talked about supernova explosions. There are much vaster explosions. There are explosions at the center of galaxies from what are called quasars. There are other explosions, maybe small quasars. In fact, the Milky Way galaxy itself has had a set of explosions from its center, some thirty thousand light-years away. And if, as I will speculate later, life and perhaps even intelligence is a cosmic commonplace, then it must follow that there is massive destruction of whole planets, that routinely occurs, frequently, throughout the universe.

[...] In fact a general problem with much of Western theology in my view is that the god portrayed is too small. It is a god of a tiny world and not a God of the galaxy, much less of a universe... I don't propose that is a virtue to revel in our limitations. But it's important to understand how much we do not know. There is an enormous amount we do not know; there is a tiny amount that we do. But what we do understand brings us face to face with an awesome Cosmos that is simply different from the Cosmos of our pious ancestors.

Does trying to understand the universe at all betray a lack of humility? I believe it is true that humility is the only just response in a confrontation with the universe, but not a humility that prevents us from seeking the nature of the universe we admiring. If we see that nature, then love can be informed by truth instead of being based on ignorance or self-deception. If a Creator God exists, would He or She or It or whatever the appropriate pronoun is, prefer a kind of sodden blockhead who worships while understanding nothing? Or would He prefer His votaries to admire the real universe and all its intricacy? I would suggest that science is, at least in part, informed worship. My deeply held belief is that if a god of anything like the traditional sort exists, then our curiosity and intelligence are provided by such a God. We would be unappreciative of those gifts if we suppressed our passion to explore the universe and ourselves. On the other hand if such a traditional God does not exist, then our curiosity and our intelligence are the essential tools for managing our survival in an extremely dangerous time. In either case the enterprise of knowledge is consistent surely with science; it should be with religion, and it is essential for the welfare of the human species.

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Écrit par Carl Sagan

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### Sources

From the first chapter of Carl Sagan's book, "The Varieties of Scientific Experience: a personal view of the search for god", edited by Anne Druyan.