

Thus Spoke the Science Apologist

It seems somewhat paradoxical that at the start of a new millennium, during what we proudly refer to as the scientific age, many people still look back to the prophecies of Revelation with such fearsome awe. There is growing cynicism toward science, a sense of betrayal, of promises unrealized. After all, was not science supposed to be the new redeemer, the accumulated knowledge of the world, our shining sword to ward off the threats of unpredictable nature? We get cures for myriad diseases only to discover new, incurable ones; we create new technologies that supposedly make life easier and more pleasant, only to spend more hours than ever at work. Even worse, technology advances so fast that it is virtually impossible for most of us to keep up, and a vast "technological underclass" is emerging, reminiscent of the socially displaced rural migrants in the medieval cities. We can send a man to the Moon (or could, when it was politically relevant) but cannot feed most of the world's population. We consume the natural resources of our planet with an appetite worthy of one of Daniel's apocalyptic beasts, feeding our endless greed for material goods without looking back at the devastation we often leave behind. And all this thanks to "science"!

So goes the credo of the discontent. Now I must wear the robes of the Science Apologist and refute all the above accusations.

"First and foremost, science does not promise redemption. Science is a human invention preoccupied with understanding the workings of nature. It is a body of knowledge about the universe and its many inhabitants, living and nonliving, accumulated through a process of constant testing and refinement known as the scientific method. What the practice and study of science does provide is a path back to nature, a way of reintegrating ourselves with the

world around us. In so doing, it teaches us that the essence of nature—from the inanimate to the animate—is change and transformation, that life and death are intertwined in a cosmic chain of being. It was the 'death' of a nearby star that triggered the formation of our Sun, where life became possible in at least one member of its court of planets and moons. If there was life near that original dying star, it was destroyed with it, the same way life here will be destroyed when our Sun burns out. This dance of creation and destruction is constantly happening throughout the universe, linking our histories, our lives and deaths, to a larger cosmic chain of transformation. As such, every link is important, from what we create and destroy in life to what we leave behind. Science may not offer eternal salvation, but it offers the possibility of a life free from the spiritual slavery caused by an irrational fear of the unknown. It offers people the choice of self-empowerment, which may contribute to their spiritual freedom. In transforming mystery into challenge, science adds a new dimension to life. And a new dimension opens more paths toward self-fulfillment." Thus spoke the Science Apologist.

"Second, science does not determine what is to be done with its accumulated knowledge: we do. And this decision often falls into the hands of politicians, chosen by society, at least in a democracy. The blame for the darker uses of science must be shared by all of us: Are we to blame the inventor of gunpowder for all the deaths from gunshots and explosives? Or the inventor of the microscope for the development of biological warfare? We, the scientists, have the duty to make clear to the public what we do in our labs, and what consequences, good or bad, our inventions may have for society at large. But there is no such thing as 'the scientists' as a group that shares a set of morals or views, or the blame for the uses and abuses of science. There is, I would like to believe, a common set of goals, to better understand the world and our place in it and, yes, to improve our living conditions and health. It has been argued that defense brings peace, that the accumulation of an arsenal of destruction wards off further armed conflicts, at least large-scale ones. We created a war without winners. Thus, many in the defense and weapons industries see themselves as wardens of the peace and not creators of weapons of destruction. Personally, I see the need to collect weapons to guarantee the peace as a sad confirmation of our collective stupidity." Thus spoke the Science Apologist.

"Finally, science has not betrayed our expectations. Think of a world without antibiotics, computers, televisions, airplanes, and cars—a world in which we are all back in the forests and fields where we came from, living with no technological comfort. How many of us would be ready or willing to do it? Can you see yourself living in some cave or primitive hut, hunting for food, physi-

cally fighting constantly for survival? There is much hypocrisy in the criticism of science and of what it has done to us and to the planet. We did it all ourselves, through our choices, creativity, and greed. It is not by slowing down scientific research or its teaching, through legislation or censorship, that we will change the inequities of a technological society; that is surely a one-way ticket back to the Middle Ages. What is needed is universal access to the new technologies, an 'internetization' of society at large, coupled with a widespread effort to popularize science, its creations, and its consequences. Only a society well versed in scientific issues will be able to dictate its own destiny, from the preservation of the natural environment to the moral choices of genetic research.

"What happened to telephones and televisions will also happen to the newest technologies; they will become (almost) universally available. But there will always be a lag time, and this delay ostracizes much of the lower-income population or those without access to the latest innovations. From this 'access gap' is born the modern version of a technological underclass, deeply mistrustful of those who control information and its production and dissemination, even though they may use it, as in the case of the Heaven's Gate sect. Anxieties soar, and the idea that conspiratorial groups are plotting to take over the world becomes plausible: movies such as *Wag the Dog* describe the fabrication of realities by the news media; hugely popular sci-fi television shows such as *X-Files* have plots based on a secret conspiracy involving a partnership between sectors of the U.S. government and aliens. Those fears are contrasted with the images of the 'successful people,' the beautiful stars, the rich and famous, the ones with access to all the new techno-toys you can possibly find. As a result, many people feel used and useless, mere spectators in a game they can never play. This situation, within limits, can be compared to what was happening in Europe in the thirteenth century, when a large urban underclass was developing. Now and then, a charismatic leader appears, promising salvation and redemption, a new life for those that follow him or her. Now and then, extremist religious movements are born, often blending Christian eschatology with technological and paramilitary elements, where the members of the group see themselves as the agents of change, the key players in the great apocalyptic drama. The 'access gap' widens into an abyss, anxiety becomes anger, and a hunger for justice blinds any vestige of social morals; in their minds, the final crusade is starting, and it must be fought to the end.

"Science, like much else, is completely helpless against this form of religious extremism. There will always be people who find no other path to spiritual salvation but that offered by an all-or-nothing kind of logic. Nevertheless, I believe there is hope. Science and religion should not be pitted against each

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other, but seen as twin paths to a better life. Their complementarity springs from their common source, our fascination with questions beyond our control and understanding. They both express our awe with things that are bigger (and smaller) than ourselves, attempting to expand our vision of the world within and without. Their methods are certainly different, as are their immediate goals, but most people need both. It would be a mistake to think that society could advance with a purely analytical or with a purely faith-based approach to existence." Thus spoke the Science Apologist.