

⁴Carol A. Hill, "Making Sense of the Numbers of Genesis," *Perspectives on Science and Christian Faith* 55, no. 4 (2003): 239–51.

⁵I have taken as independent the age at which a patriarch's named son was born and the remaining years of his life.

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Adam and Eve

Peter Rüst suggests that Adam and Eve in Genesis 2–4 came later than the first humans in Genesis 1 (*PSCF* 59, no. 3 [2007]: 182–93).

A problem with this suggestion is that these chapters are closely linked. The same word is used to describe Adam in Gen. 2:7 (*ha'adam*, "the man") as the first human in Gen. 1:27. The name Adam (*adam*) is only used later on (the article is retained, except after *le*, until Gen. 4:25). Further, the story of the creation of Eve out of Adam's rib in Gen. 2:21–23 explains the transition from singular to plural in Gen. 1:27: "God created the man in his own image, in the image of God he created him; male and female he created them." Genesis 2:7ff thus amplifies Genesis 1, as its introduction (Gen. 2:4–6) suggests.

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Prudence and the Redeeming of Technology: A Response to Ken Funk

Ken Funk gives sound advice when he concludes his article (*PSCF* 59, no. 3 [2007]: 201–11) by calling us to "learn prudent technological innovation and practice" and to "think critically and Christianly about technology" (p. 209). However, the arguments for this conclusion would be strengthened and would gain greater coherence if he would abandon what appears to be Platonic presuppositions regarding the nature of created reality, human life, and therefore of technology.

Funk rightly sees and describes the ambivalence in technology. But he cannot quite take the next logical step of admitting that the question, "Is technology good or evil?" is simplistic and ultimately invalid—this in spite of his admission that "technology may be intrinsically value-neutral" (p. 201). This apparent contradiction appears to be caused by Funk's division of reality into a values-neutral physical realm (including technology) and a spiritual realm (which includes "values" and "religion") and his often cited belief in the hierarchical ordering of each realm. While I applaud his discussions of "the ambivalence of technology" (p. 204), "the promotion of subsidiary goods" (p. 204), and "the illusion of human sovereignty" (p. 205), I fear they are weakened by his weddedness to axiological hierarchy and ontological dualism. That hierarchy and dualism resonate more with the world of Platonic philosophy than with the world of the Bible.

When I read the Bible, I learn of a Creator who brought into being all things and who originally delighted in all things (Genesis 1). I learn that the purpose of all things is to serve the Creator (Ps. 119:89–91). I learn that humankind was created in the image of the Creator and called to serve in a particular way: to care for and enable the rest of creation (Psalm 8). I learn that despite humankind's rebellion and the curse wrought upon the whole of creation as a consequence of that rebellion, the Creator has promised to redeem the whole of creation (Col. 1:20). All this suggests that technology is one of many kinds of human activities, all of which are characterized as "service to the Creator" and all of which can be performed in a multiplicity of obedient and disobedient ways. Hence technology cannot be characterized as good or evil in itself (inherently) because it does not exist "in itself." Technology is just one way in which we as the Creator's image bearers, along with the nonhuman creation, relate to the Creator (or as Funk writes, "commune" with the Creator). As such, engaging in technology is no more or less a "spiritual" activity than is attending a church service. For one biblical affirmation of that claim, read the account of Bezalel and Oholiab in Exod. 35:30–36:5. To engage in technology obediently we need, like Bezalel and Oholiab, to be filled with the Spirit of God.

The Platonic notion that there is a hierarchy of human activities ranging from the base, through the mundane, to the noble is often read into the story of Mary and Martha (Luke 10:38–42), as Funk does in his article. For a convincing refutation of that interpretation (which includes arguments made by John Calvin in his *Institutes of the Christian Religion*), read Lee Hardy's *The Fabric of This World* (Eerdmans [1990], 54–8).

Earlier in this letter, I wrote that "humankind was created in the image of the Creator and called to serve in a particular way: to care for and enable the rest of creation." Technology is one of the chief ways in which we "enable" the rest of the creation to be what the Creator intends for it to be as it unfolds in history. There is a relationship that exists between the human and nonhuman creation that is wonderfully described in Ezekiel 36 (particularly verses 8–12) and that is the foundation for our work in technology. To fully realize that relationship (and to fully acknowledge Ken Funk's call for prudence and critical thinking about technology) we need to see all things holistically, casting off the dualistic and hierarchical glasses fashioned for us by the ancient Greeks.

Finally, thanks to Ken Funk for a most interesting article. The Dordt College Engineering Department read it and spent a delightful afternoon discussing it.

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A Response to Ken Funk

Many ASA members share feelings of guilt associated with "technology," triggered by modern doctrinaire

environmentalists and now intensified by Ken Funk in his article (*PSCF* 59, no. 3 [2007]: 201–11) on “technology.” I have an instant cure for this mode of malaise, guaranteed to elicit viscerally from all readers the thought, “Thank God for modern technology”: read, as I have, the book review of *Hubbub, Filth, Noise and Stench in England, 1600–1770* by Emily Cockayne (Yale University Press, 2007) titled “Cesspool in the City” by Florence King in the *American Spectator* (September 2007): 66–8. In this case, we thank God for modern technology of sanitary engineering—plumbing, water supply, waste removal, and so forth. Similar joyful exclamations occur as we read of the sounds, smells, and sights of urban neighborhoods in the nineteenth century. Thus we honestly can thank God for electricity and automobiles (vs. horses).

The point is that “technology,” at least in these cases, can be viewed essentially as an unqualified good, which we not only accept gratefully but perhaps ponder why these gifts were so delayed in the long history of humans. As in all things, we accept the unavoidable risks and work to reduce them—a long-term task for many engineers and scientists.

Technology, per se, can be good with no need to look for associated faults of negligible significance. (In all cases, the goal of perfect reliability is not attainable.) As such, I believe many Christians involved in the development of “technology” can validly present a positive view of technology to the ASA. That was the guiding thought in my role in creating the name “Christian Engineers and Scientists in Technology” (CEST)—a current ASA affiliation.

I have had a life-long career in developing microwave power technology and microwave safety standards. Throughout, I thank God daily for the insights that reflect imperfectly *his* understanding of microwave physics and have never felt guilty before God for my career. If I refer to the “Guide to Prudent Technological Practice” (Table 1 in Funk’s paper), I meet all his criteria for positive assessment except those (especially #8) that imply absence of competition (industrial or academic) and valid proprietary intellectual property. This ethical dilemma is akin to debating whether the New York Yankees or the Boston Red Sox is “God’s team.” We can rationalize this problem and still end up optimistic pro-technology Christians.

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Residual Radiocarbon in an Old-Earth Scenario

Radiocarbon dating of ancient organic material is based on the radioactive decay of ^{14}C , with a half-life of 5730 years, or with a decay constant $\ln 2 / (5730 \text{ years}) = 0.121$ per millennium. After 100 millennia, the ^{14}C has decayed to an undetectably minute fraction of its original value (less than 6 millionths). However, in rocks or minerals millions of years old, contamination by modern carbon or other processes may introduce tiny amounts of ^{14}C . To interpret

these as due to decay of original organic ^{14}C , and thus to get an apparent age, is quite mistaken.¹

Recently, Rogland has reinterpreted some data, cited by young-earth creationists, on minute fractions of ^{14}C in samples dated by other methods as being 0.4 to 2000 million years old.² He considers as a possibility that this ^{14}C is indeed a remnant of original organic ^{14}C , but that it has not been decaying with a constant rate constant. Instead, a decay equation of stretched exponential form is proposed, $N = \exp(-At^{1+B})$.

The similar Kohlrausch-Williams-Watts (KWW) equation³ accurately describes the decay or relaxation of stress in some viscoelastic materials after they are stretched, or the analogous relaxation of charge in a dielectric. A viscoelastic polymer, with a broad distribution of molecular weights, has a spectrum of relaxation processes, each with a relaxation time, the analog of the decay constant. When the relaxation processes have gradually decreasing strength as their relaxation time increases, the KWW equation represents their total effect well. However, radioactive decay is entirely different: there is no distribution of atomic weight of the decaying nucleus. Rather, the one decay process has a single decay constant, leading to simple exponential decay. Accordingly, in teaching or presentations on dating,⁴ one should keep to the accepted understanding of radioactive decay, without mention of the stretched exponential as an alternative.

Maybe we should focus instead on how much change there is in intervals we experience, such as a year or a lifetime. Because of God’s faithfulness in sustaining his creation in a stable way, we see little change in nature during such an interval. The ancient Bible writers, who had no technology to measure tiny changes due to processes taking thousands or millions of years, may have expressed this stability symbolically by attributing life spans of many ordinary lifetimes to the patriarchs (Genesis 5, 11). While the total of several thousand years may then have been effectively infinite to the Bible writers, to our generation with scientific knowledge of Earth’s past going back billions of years, it seems short. Instead of debating vainly about ages, we should rather heed the biblical call to stewardship of creation in the light of scientific understanding of Earth’s history, as we view its destruction in our lifetime extending from atmosphere to zoosphere.

Notes

¹R. Isaac, “Assessing the RATE Project,” *PSCF* 59, no. 2 (2007): 143–6.

²R. Rogland, “Residual Radiocarbon in an Old-earth Scenario,” *PSCF* 59, no. 3 (2007): 226–8.

³Wikipedia, http://en.wikipedia.org/wiki/Stretched_exponential_function. Accessed October 31, 2007.

⁴D. A. Young, “How Old Is It? How Do We Know? A Review of Dating Methods,” *PSCF* 58, no. 4 (2006): 259–65; 59, no. 1 (2007): 28–36; 59, no. 2 (2007): 135–42.

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