proved ease of running a home that running water or just a washing machine has provided.

As for the technologies that the semiconductor has transformed, such as data-rich communications, the significance of such changes for society as a whole is really quite small relative to the transformation brought about simply by steam power (which was wildly laborsaving in manufacturing and transportation), let alone by the entire industrial revolution!

Those making overarching claims about the significance of silicon for our society ought to do some careful thinking about the actual changes that semiconductors have brought about (mostly mere improvements), recognizing that at least some of the current craze (for example, about the Internet) is mere hype, and often a substitute for substance. It might also be useful for them to consult a bit with some actual historians.

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Reflecting on Heaven: Prospects Looking Up, Data Still Needed

The delightfully whimsical letter from Jorge Mira Peréz and Jose Viña (PHYSICS TODAY, July, page 96) on whether heaven is hotter than hell calls for some modification. Specifically, they have omitted the factors of the albedos of heaven and Earth from the expression for the temperature ratio they give.

Now the albedo (reflectivity) of Earth is well known, and its value is about 0.4. On the other hand, the albedo of heaven is rather hard to estimate, even though the Bible does give some clues, such as that the streets of heaven are paved with gold and the place has lots of alabaster walls. Moreover, the inhabitants are usually clothed in white, and there must be a fair-sized number of them there by this time (of course, it can't compare in population with the other place).

Lacking hard data on the albedo of heaven, perhaps we ought to do what any good physicist does in such a situation and turn the problem around to see what we can make of it. I propose that we make some reasonable assumptions about the temperature of heaven and from that calculate its albedo. Since the albedo varies only as the fourth root of the temperature, this procedure ought to give us at least a fair estimate.

Now what can we reasonably assume about the temperature of heaven? For one thing, heaven is generally thought to be a comfortable place, else why would so many aspire to spend eternity there. The Bible concurs in—and in fact encourages—this belief. Of course, although we don't know what form our heavenly bodies may eventually take, the biblical heaven, by all accounts, is highly anthropomorphic, so it may not be too far off the mark to assume that heavenly temperatures are close to earthly temperatures. In this case, the albedo ratio becomes the fourth root of 8, or 1.68. Taking Earth's albedo as 0.4 gives us a heavenly value of about 0.66, which also happens to be the value for the planet Uranus—a coincidence that should not be taken to suggest that Uranus would be a heavenly place to spend eternity (it's mighty cold there).

Our estimated albedo for heaven is at least not unreasonable. With such a relatively high reflectivity, heaven would indeed be a bright place, and this is in agreement with biblical information. Our albedo value for heaven is also not far from the values for gold and for angelic raiments, though I don't have any data for alabaster.

Perhaps some of your astute readers can fill in the gaps. What a pity we don't have access to relevant experimental data, which seem to be as well hidden as the Higgs boson.

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Identifying the Inventor: Tesla's True Ethnic Origin

In discussing the history of physics research at Westinghouse Electric Corp (PHYSICS TODAY, August, page 53), Irwin Goodwin misleadingly refers to inventor Nikola Tesla as having been Croatian.

Technically, Tesla was indeed born in Croatia, which was then (1856) an Austro–Hungarian province. However, in these current times of political correctness, it is necessary to note that he was not an ethnic Croatian but rather an ethnic Serbian. As Margaret Cheney explained in her biography, "The tiny house in which he was born stood next to the Serbian Orthodox Church, presided over by his father, the Reverend Milutin Tesla. . . ."[1] And as she then emphasized, "Ethnic traditions are often most tenaciously observed by transplanted minorities and the Teslas were no exception."

Tesla settled in the US in 1884, became a naturalized US citizen in 1889 and lived out the remaining 50-plus years of his life in his adopted country. Today, his origins are still remembered in Serbia, where his visage graces the five-dinar banknote.

Reference

1. See, for example, M. Cheney, *Tesla, Man Out of Time*, Prentice-Hall, Englewood Cliffs, N. J. (1981), p. 6.

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Finding Clues: Laser Technology Hints at Indian Bomb Materials

In his report on the nuclear tests conducted by India and Pakistan in May (PHYSICS TODAY, July, page 45), Irwin Goodwin states that "at their press conference, the [Indian] scientists refused to describe the types of fission materials. . . ." In this regard, it should be noted that India's Bhabha Atomic Research Centre does have sophisticated narrow-linewidth tunable laser system technology that could be applied to enrich uranium. This is an oscillator–amplifier dye laser system excited by high pulse-repetition-frequency (prf) copper vapor lasers.[1] Its oscillator is of a hybrid multiple-prism grazing-incidence grating design[2] and is capable of yielding the tunable narrow-linewidth laser emission necessary for selective excitation. It is well known in the laser community that this class of high-prf tunable narrow-linewidth laser technology can be applied to atomic vapor laser isotope separation.[3]

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Correction

July, page 20—In the story on microcalorimeters, the affiliation of Norm Madden, Jeff Beeman and Eugene Haller should have been given as Lawrence Berkeley National Laboratory, not as Lawrence Livermore National Laboratory. ■