Letters

Technology Transfer and Universities

There is at present great ferment in our institutions over something called "technology transfer." It is the "in" thing to be doing, and our great research universities are being asked to show in their grant proposals how they will transfer their technology to U.S. industry. The problem is that in many cases there is little if any technology to transfer. Most of these universities do not do technology: they do science and engineering. Through their faculty and graduates and their research programs they have a great wealth of knowledge and cutting-edge research results to transfer, but not usually technology. Indeed, we need to encourage better means for transfer of this knowledge.

Technology is the application of knowledge, tools, and skills to solve practical problems and extend human capabilities. It is enhanced by the discoveries of science and shaped by the designs of engineering. It has been primarily the responsibility of industry. Unfortunately our changing national values and the associated tyranny of the bottom line have mitigated our incentives to take necessary risks and have weakened our ability to compete. Technology is indeed where we must focus our energies and ideas. We need to develop and transfer it within our industrial system, where it can benefit our nation. But to pretend that it will come from our great research universities is nonsense.

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Timekeeping

Eliot Marshall's News & Comment article "A matter of time" (18 Dec., p. 1641) needs several clarifications.

Time balls were devices used well into the 20th century to give ocean navigators a convenient way to rate their chronometers. They were common before the radio: nearly 200 were in use. There were balls, guns, boards, flags, and shutters; not until radio time signals were broadcast widely were such visual signals dismantled. The first time ball, erected in 1829, was at the Royal Navy's Portsmouth base (*1*). Greenwich's time ball—the third in the world—was also erected to provide a signal for navigators; time for the public was a secondary consideration, for the Royal Observatory was an Admiralty function then. The time ball there is one of four still operating; its instant of release is 1 p.m., not noon (*2*). The Times Square, New York, ball—now an "apple"—although reminding us of this important visual time-signal service, is not a relic of the era. The tradition began in 1908; exactly at midnight, the lighted "Times Ball" reached the bottom of its descent, and a huge display of lights was turned on.

"Greenwich Mean Time" did not begin at the end of the 19th century, as the article suggests, but during the 17th, with the founding of the Greenwich Observatory. The concept of mean time—averaging the variations in the solar days over a year to generate a uniform scale and adjusting one's mechanical timekeeper to count the resulting seconds—became important with the invention of accurate (pendulum) clocks; cities switched to mean time from apparent (sundial) time during the 18th century. "Greenwich" simply tells one that the timekeeper has been set to Greenwich's local time, the mean solar time along the observatory's meridian. The designation GMT seems to have been adopted officially for civil purposes in 1880, but was in use decades earlier (*3*).

Astronomers moved from Greenwich to Herstmonceux, Sussex, after World War II, and Britain's time service was placed there in 1957 (*4*). The Royal Observatory—a national treasure designed by Sir Christopher Wren—continues as part of the National Maritime Museum; the Royal Greenwich Observatory's Sussex castle is the one to be transformed to a hotel.

Finally, the public is little affected by "adjustments" made in time reckoning; calendar reform, of course, is a much different matter. Even the worldwide adoption of time zones from 1883 on was driven more by geophysical needs than by civil or astronomical ones (*5*). Governments took scarcely any action on civil time matters until the societal effects of daylight saving time became apparent (*6*).

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4. D. Howse, *Greenwich Time and Discovery of the Longitude* (Oxford Univ. Press, Oxford, England, 1980), pp. 175 and 202.
5. I. R. Bartky, *Vistas Astron.* **28**, 105 (1985); *ibid.*, *Technol. Culture*, in press.
6. _____ and E. Harrison, *Sci. Am.* **240**, 46 (May 1979).

Protection of Rights

In his 8 January letter (p. 127), M. B. Mittleman expresses concern about a "proposed guideline of the National Conference of Lawyers and Scientists (NCLS) for 'bringing charges anonymously' against those presumed guilty of scientific fraud." The need to protect legitimate "whistleblowers" against possible reprisals was discussed at the NCLS workshop, and anonymity was advocated by some participants as one means of offering such protection. The meeting did not in any sense endorse the concept, however. Indeed, a central issue was the need to protect the rights of *all* parties involved in allegations—the accused as well as the accuser and the larger scientific community.

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Proposition 65: Implementation

Steven A. Book's letter (18 Dec., p. 1635) replying to Philip H. Abelson's editorial (25 Sept., p. 1553) amply illustrates the major confusion and dislocation that will occur unless California's Proposition 65 is implemented in a clear and sound way.

The facts are that (i) virtually all food contains trace amounts of carcinogens, and (ii) most of these carcinogens are present at such low levels that the Food and Drug Administration and state agencies have not found it necessary to promulgate formal regulations to control them. Federal and state agencies adopt specific enforcement requirements of this kind only when a substance reaches a level that presents a potential safety problem, not when a substance is present at a level that presents an insignificant risk.

Book's letter makes two quite different statements about the intention of California to implement Proposition 65. In the fourth paragraph of his letter, he states that California intends to recognize "regulatory levels for carcinogens and reproductive toxicants that are regulated by state and federal agencies." This would be an inadequate approach, because state and federal agencies have not established specific regulatory levels for trace carcinogenic contaminants in most of the food supply. In his fifth para-

graph, however, Book states that those who comply with "existing laws and regulations" will also be in compliance with Proposition 65. This is a much broader approach, and recognizes that compliance with federal law, in the absence of any specific regulatory levels for carcinogens, would be quite sufficient to demonstrate that trace carcinogenic substances in the food supply pose no significant risk.

To the extent that California follows the fifth paragraph, Book is correct in stating that the thousands of food items sold throughout California will not require a warning. To the extent that California limits its approach to that suggested in the fourth paragraph, however, virtually all food would require such a warning. The Scientific Advisory Panel appointed by California Governor Deukmejian recommended in December that the broader approach, described in Book's fifth paragraph, should be followed.

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Journal Prices

Keith Bowker's contentions (Letters, 30 Oct., p. 597) notwithstanding, the discriminatory pricing policy of some foreign publishers has substantially increased the cost of journals for American subscribers beyond what can be attributed to general inflation. These unwarranted price increases have not only worsened the financial difficulties for libraries, but they pose a greater potential threat to the scientific community than seems to be widely realized. Moreover, these problems will not be solved by electronic or other proposed technical means, but could conceivably be aggravated by them.

Many of Bowker's arguments are untenable. For example, fluctuations in foreign exchange rates have little to do with the discriminatory prices that some British and other European publishers have established for American subscribers. Many American libraries are quite willing and able to pay for the subscriptions in the currencies of the respective countries and thereby relieve the publishers of "the attendant risks of loss should the dollar strengthen."

Bowker's explanation of how his company tries to defend against possible losses by selling dollars forward and thereby reduce its safety margin is not clear. How could there be a future loss once dollars have been sold forward and the price has been definitely established?

The fact is that Blackwell Scientific and other publishers have insisted that North American libraries pay for their subscriptions at special, higher rates. Furthermore, they appear to have made every effort to prevent these libraries from obtaining the publications at the prices effective in the country of origin. As an English subscription agent told me only a few days ago, an increasing number of publishers demand payment at the rate established *by them* for the country of ultimate destination, even when the publisher mails the journals in bulk to the English agent.

Table 1, showing prices for one of the journals published by Blackwell Scientific, confirms Bowker's contention that, over a 4-year period (1984 to 1987), there was no increase and even a slight decrease in North American prices. This decrease is likely to have been prompted by the slow awakening of American libraries to the overcharges and to the gentle protests that were beginning to be heard.

Nobody familiar with exchange trends and the direction in which the value of the British currency relative to the dollar was moving at that time will feel indebted to the publisher. In mid-1983, for example, a year for which Blackwell Scientific had converted its prices at £1.00 per $2.10, the official exchange rate was about £1.00 per $1.50; a year later, the rate had declined to £1.00 per $1.32. In mid-1985 and mid-1986, the rates were as low as £1 per $1.30. The trend in exchange rates reversed later but, at the end of 1986, the rate was still only about £1.00 per $1.45.

Throughout these years, Blackwell Scientific was charging prices to American libraries that could not be reasonably justified by existing exchange rates or by other risk factors. Even after these prices were reduced, Blackwell was converting the dollar at almost $1.60 per pound sterling for the 1986 and 1987 subscriptions, subscriptions that were most likely collected during the preceding years. Only recently has the dollar fallen to the level at which, according to Bowker, Blackwell Scientific has for months been making its calculations and collecting next year's subscriptions.

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Table 1. Subscription rates for the *Geophysical Journal of the Royal Astronomical Society*, 1982 through 1988.

Year	Individuals		Libraries		
	Residents outside the U.K. (£)	Except those in U.S. or Canada ($)	In the U.K. (£)	Outside the U.K. (£)	In the U.S. ($)
1982	36	80	190	220	485
1983	40	84	205	235	495
1984	44	84	230	265	505
1985	36	68	235	270	505
1986	42	67	245	280	450
1987	42	67	245	280	450
1988					495

Intercontinental Speedster

If Roger Lewin is right that the Pleistocene land bridge between Siberia and Alaska was 100 meters long (Research News, 27 Nov., p. 1230), my countryman Ben Johnson could have invaded the New World from the Old in 9.83 seconds. Might Lewin have meant 100 *kilometers*?

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Infamy

I was reading William Booth's postmortem on Three Mile Island (News & Comment, 4 Dec., p. 1342) when I came across a reference to the "infamous" nuclear aircraft engine program. I was involved in that program, in a very small way; and it was probably naïve, but infamous?

A program that put offensive nuclear weapons into outer space, or that deliberately upset the balance of power, while making the United States a debtor nation, *that* would be infamous.

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Erratum: In figure 1 of the Report "Activation of the HIV-1 LTR by T cell mitogens and the trans-activator protein of HTLV-I" (11 Dec., p. 1575), the labeling was incorrect. The panel labeled "+*tat*-1" should have been labeled "Actin," and the panel labeled "Actin" should have been labeled "+tat_{HIV-1}."

Erratum: The final paragraph of Richard A. Kerr's article "Drilling into surprises beneath an Inyo Crater" (Research News, 22 Jan., p. 350) should have read: "A bit disconcertingly, the magma influx to the chamber seems to be continuing at a reduced rate of about 5 million cubic meters per year. At that rate, only a few decades would be needed to accumulate the volume of magma produced by one of the eruptions 600 years ago."