

Ethics Concerns Draw Many Questions, Some Answers

PHYSICS TODAY took a welcome step in devoting its November 2004 issue to ethical concerns. (See that issue for articles by Kate Kirby and Frances Houle on page 42 and Caroline Whitbeck on page 48.) But the focus on treatment of junior researchers, scientific trust, and interactions with society misses ethical issues associated with the gradual transformation of pure science into big business. In the two decades of flat government spending on science and technology prior to 1990, the fraction of funds allocated to projects over \$25 million increased¹ by a factor of 26, and the trend continues. So far, the ethical impacts of this transformation have been obscured by better-publicized concern over “corruption of science” by the biotech and defense industries. But with physics departments dwindling in the US and abroad, we need to gauge the effect of ethical issues on the health of our field.

As one example, what position are scientists to adopt if the scientific premise that justifies their \$100 million project is removed before the hardware is completed? Do they follow scientific method and accept that a hypothesis has been falsified? That would be the favored choice for an individual researcher. But is it a realistic option for a project manager faced with laying off scores of scientists and engineers? The pressure is intense to set aside ethics and follow the lead of certain drug companies that, when they receive bad news about adverse side effects, suppress or delay release of the inconvenient evidence.

In this interesting new research environment, solution of an important scientific problem is more likely to be greeted with consternation than enthusiasm. Pressure exists to preserve, or even invent, suitable problems that justify big science.

Letters and opinions are encouraged and should be sent to Letters, PHYSICS TODAY, American Center for Physics, One Physics Ellipse, College Park, MD 20740-3842 or by e-mail to ptletter@aip.org (using your surname as “Subject”). Please include your affiliation, mailing address, and daytime phone number. We reserve the right to edit submissions.

Despite its proven effectiveness, individual problem-solving with modest resources is increasingly questioned, at least in part because it is easier for both universities and federal agencies to administer fewer large grants. Even the award structure of our professional societies increasingly rewards acumen in preserving scientific problems to maintain stable funding, rather than skill in solving them. Some evolution of norms is understandable, but impacts on intellectual integrity also need to be considered.

Pressures on ethics are increasing throughout science. But the impact is likely to be felt most in the physical sciences, whose main appeal is raw intellectual challenge—the biosciences presently provide young researchers an easier path to fame and fortune. Future National Academy of Sciences planning for physical sciences research needs to balance the undoubted need for a certain amount of big science against the pressures on integrity that accompany too much reliance on large projects. We need to act soon. At present, the brightest youngsters have trouble differentiating the big business of science from the many other big businesses with similar ethics and better career prospects.

Reference

1. B. Dalrymple, *Eos Trans. Am. Geophys. Union* **72**, 1 (1991).

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I want to present another facet of today's ethics. I work for a company that is a vendor to the astrophysics, atmospheric physics, and defense communities. I and my colleagues have seen a nearly total disregard for protecting a vendor's proprietary information supplied with hardware, and even proprietary information supplied for a request for proposal (RFP).

For technical documentation and software, we require from our customers a license agreement that allows the proprietary information to be used for maintenance and archival purposes only. The information represents many person-years of

company development and is at the heart of every product we build.

One university put our source code for our telescope control system on an unprotected website. Another university sent a section of our source code to a competitor asking if they could improve it. Another institution used our schematics to make a major change in the hardware so the customer could implement a competitor's software under a different operating system.

A government laboratory passed on to another institution the part numbers from our drawings. Another government lab left complete documentation for a state-of-the-art scanner on a table next to the device in an unlocked and unattended room for six weeks; the documentation disappeared.

A government observatory used our proprietary drawings to make unauthorized wiring changes. After we reminded them that they had violated the terms of the license agreement, they made unauthorized changes a second time.

Recently, we responded to a university's invitation to bid for a telescope. The invitation was replaced with an RFP that contained new specifications, including our carefully marked proprietary information from our initial response.

In most cases, the people responsible for divulging the proprietary information admitted they had never been briefed on the care and control of proprietary information and didn't even know that their institution had signed an agreement.

There is more to ethics than was discussed in the November articles.

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On any problème du jour, and these days it's ethics, a person must go through some visible motion to convince all interested parties that “something” is being done. The process has a therapeutic effect: Frustrations get vented (often anonymously), the judgments of “experts” gain support, and one gets to imagine that the “bad guy” at least feels bad; all these outcomes