rence's far-fetched scheme confronted too many technical difficulties compared with the nuclear reactor approach. And the cost per neutron produced would have been much higher using an accelerator. Consider the irony of building a nuclear reactor plant to power an accelerator, when a reactor could do the whole job without the accelerator facility ever being built!

In summary, not only is history repeating itself—nothing seems to have been learned. The fusion power plant is a dead-end today, just as it has been every decade for the last five. Accelerator production of neutrons for tritium breeding is a much inferior approach compared with the use of fission reactors. That is true today just as it was 50 years ago.

These projects are ill-advised. The country would be better served by redirecting the large required budgets to other scientific enterprises.

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Genetic Discrimination

One can be doubtful about the long-term efficiency of the recommendations from the U.S. National Institutes of Health–Department of Energy's Working Group on Ethical, Legal, and Social Implications of the Human Genome Project and the National Action Plan on Breast Cancer to protect against genetic discrimination in health insurance (K. L. Hudson *et al.*, Policy Forum, 20 Oct., p. 391). These recommendations aim at negative discrimination, but overlook positive discrimination, that is, the possibility to discriminate in favor of "good" risks that "deserve" lower rates. Such a possibility is remote today, as genetic research priorities are to identify diseases; but in a not-too-distant future, as knowledge of the human genome advances, science should be able to distinguish genetic features that decrease, as well as increase, individuals' health risks. When this happens, today's trend will be reversed, as it will be the consumers who have a "good" genome who will insist on showing it to their insurer to get a better rate.

The law could explicitly forbid positive as well as negative discrimination, or prevent any disclosure of genetic information to insurers, even by the concerned individual. But that would not work either: To respond to new market demand, insurers would design new products with limited coverage and lower rates that would be the preferred choice of customers who know they have a genetically low risk, whereas people who know they have a higher risk would be inclined toward more extensive coverage with higher rates.

Genetic research has revealed a new inequality that was heretofore hidden by a veil of ignorance. Addressing it will not be easy. Politicians in all countries will need to be imaginative to devise a new solidarity among their fellow citizens, a solidarity that will no longer be based on ignorance, but on the new genetic knowledge science has discovered.

Maybe genetic research, after causing such serious ethical problems to health insurance, will help resolve its economic problems by advancing predictive and preventive medicine.

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Barbara R. Jasny is right in her editorial of 20 October (p. 359) to suggest that "as-

similating the implications of our genetic heritage in a way that will benefit individuals and society is the real challenge." However, the attempt to meet this challenge by Hudson *et al.* is disappointing. They seem at times to be on the verge of recognizing the genuine dilemmas presented by genetic information. But in the end they take recourse in the law to outlaw "discrimination" and the "misuse" of genetic information by insurers. Why is it "discrimination"? Why is it misuse? They concede that insurance companies generally incorporate medical risk factors into their actuarial calculations. Why should this not apply to risks revealed by genetic testing? Their advocacy of a "return to the risk-spreading goal of insurance" would make sense if individuals were prohibited from taking out, or increasing, insurance coverage in the light of genetic tests. Do Hudson *et al.* propose to outlaw such actions?

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As co-chairmen of the committee on bioethics of the Biotechnology Industry Organization, we believe that the discussion by Hudson *et al.* concerning the risks posed to insurability by advances flowing from genomic research is a powerful reminder to both the academic and the biotechnology communities that discoveries made in the research laboratory are hyperlinked to clinical medicine and to society at large. The four succinct recommendations offered by Hudson *et al.* concerning an approach to avert genetic discrimination in insurance are welcome. We and many of our colleagues within the world of genomics and genetic testing would strongly support legislation to implement them. A new law in Oregon (Senate Bill 276, which became effective on 9 September) is an indicator that once state legislators are educated about the dimensions of the problem, they can draft legislation that accomplishes as much as possible in the face of federal laws that preempt some aspects of insurance from state oversight.

All of us who work in genomics and genetics, whether in industry or academia, should encourage the socially responsible use of the knowledge we are generating. One good way to do this is to become involved in the public discussion of bills like the Health Insurance Reform Act (S. 1028) that seek to address the problem of genetic discrimination.

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E-Mail Privacy

In their 4 August editorial (p. 615) about scientists' use of electronic communication, Shmuel Winograd and Richard N. Zare allude to intellectual property issues raised by electronic publication on the Internet. The lack of confidentiality associated with unencrypted, or "plaintext," Internet electronic mail also raises intellectual property concerns. An author of an e-mail message should appreciate that the Internet "store and forward" service functions by passing the message from mail server to mail server in the direction of the destination address. As the message passes through various intermediate servers, it may be read or copied by an unintended party. The sender of the message cannot control the path of e-mail as it travels