

Early "Fast Track"

Modern technology may well be a driving force behind the current trend to rapid publication of scientific papers, as Leslie Roberts describes in her News & Comment article (18 Jan., p. 260). Yet more than three centuries ago, when the scientific journal was a new invention, mail was carried by horse, and printing was done by hand, it was possible to publish a scientific paper in a few weeks.

Isaac Newton's discovery of the compound nature of sunlight, published in *Philosophical Transactions*, no. 80 (19 February 1672), was the first major scientific discovery to be announced in a journal rather than a book (1). Just 7 years earlier, Henry Oldenburg (the "obscure secretary of the Royal Society of London" mentioned by Roberts) had founded *Philosophical Transactions*, the first periodical devoted solely to scientific matters. Newton's paper was dated "Cambridge/ Feb: 6th" and was received by Oldenburg in London on 8 February. The paper was therefore published in a near record 11 days after receipt. If in a skeptical spirit we choose to doubt that that issue actually appeared on its publication date, the paper was still published—at the outmost—in an impressive 32 days, for on 11 March, Oldenburg sent a copy of that issue to Christiaan Huygens in Paris.

The "fast track" also appears to have been established at this time. Although Newton was a young, unpublished professor, he was a rising star of English science. Shortly before Christmas 1671, his reflecting telescope (the first ever constructed) was greeted with great acclaim by the Royal Society, and Newton was immediately elected a Fellow. On 18 January, Newton advised Oldenburg that he was preparing another contribution that he considered "the oddest if not the most considerable detection which hath hitherto been made in the operation of Nature" (1, pp. 82–83). The week before the paper arrived, he promised Oldenburg he would soon dispatch his paper.

The refereeing process, however, was rather different then. The negative report of Robert Hooke, at the time England's leading authority on optics, neither halted nor even delayed publication. After Hooke delivered his critical report to the Society on 15 February, it nonetheless decided that "the printing of Mr. Newton's discourse . . . might go on" (1, p. 115). The matter did not end there, for the two carried out a

notorious, rancorous dispute over the course of many years.

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NOTES

1. The chronology recounted here may be readily established from *The Correspondence of Isaac Newton*, Vol. 1, 1661–1675 [H. W. Turnbull, Ed. (Cambridge Univ. Press, New York, 1959)].

Drug Abuse Policy

A. Goldstein and H. Kalant ("Drug policy: Striking the right balance," 28 Sept., p. 1513) discuss the ethical options facing policy-makers and argue for reducing both the supply and demand of illegal drugs. However, abuse of legal, prescription drugs accounts for the majority of drug-related emergency room visits, 70% of all drug-related deaths, and more injuries and deaths than all illegal drugs combined (1). More than 300 million doses of drugs that are regulated by the Controlled Substances Act are abused each year, 80 to 90% of which are obtained from physicians, pharmacies, and hospitals (2).

Efforts to control prescription drug abuse have received neither the attention nor the funds that illegal drug programs have. Individual states have successfully employed triple prescription programs (3) or developed new techniques for data analysis (4) to reduce the availability of prescription drugs, but there is little federal emphasis in this area. Some 0.3 to 0.4% of physicians over-prescribe drugs with abuse potential (4), as can be identified by records of the Drug Enforcement Administration, prescription audits, Medicaid audits, and triple prescription programs. Because prescription drugs represent the majority of abused drugs and information is readily available regarding the manufacture and distribution of these agents, interventions to reduce the abuse of prescription drugs have a greater potential for reducing overall drug abuse than efforts directed at the abuse of illegal drugs.

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REFERENCES

1. "Project DAWN Annual Report, 1983" (National Institute on Drug Abuse, Rockville, MD, 1984); *Comprehensive Approach Needed to Help Control Prescription Drug Abuse*. Report by the Comptroller General to the Congress of the United States (Government

- Printing Office, Washington, DC, 1982).
2. *Retail Diversion of Legal Drugs—A Major Problem with No Easy Solution*. Report by the Comptroller General to the Congress of the United States (Government Printing Office, Washington, DC, 1978); G. R. Haislip, *Subst. Abuse* 4, 4 (1982).
3. Drug Enforcement Administration, Department of Justice, *Multiple Copy Prescription Programs Resource Guide* (Government Printing Office, Washington, DC, 1987).
4. A. S. Hollister, *Subst. Abuse* 11, 69 (1990).

Goldstein and Kalant provide an excellent review of the complex nature of forming a balanced policy on substance abuse both for an individual user and for the nation as a whole. There are, however, two areas that could have been clarified. The first relates to the use of operationally undefined terms such as "addiction" and "addictive drugs." The World Health Organization (WHO) (1) suggests that the term "neuroadaptation" be substituted for "dependence" and that the term "abuse" not be used because it is judgmental. WHO further recommends that "drug dependence syndrome" be used to encompass all of the phenomena previously described by the terms "dependence" and "abuse." The advantage of this new terminology is that it distinguishes between primary processes such as drug self-administration and the secondary consequences resulting from chronic drug intake (such as neuroadaptation). Finally, the terms proposed by WHO are more conducive to operational analyses and are devoid of value judgments, such as in the phrase "dangerous addicting drugs. . . ."

The above is not merely a semantic argument, as the choice of terminology leads to a second point. The data in Goldstein and Kalant's table 1 include a ranking system for the relative risk of addiction. There is no citation for this rank order or description of the methods used to determine these values. From the perspective of drug testing, pharmacologic assessments can be most effectively demarcated by the events before or after repeated drug-taking behavior (2). Such distinctions provide the foundation for separating drugs on the basis of their liability for abuse or their dependence potential, two properties that may or may not coexist (2). With respect to the former, there are a number of well-validated techniques for determining a drug's liability for abuse, both within and between pharmacologic classes (3). Similarly, a drug's dependence potential can be determined by using procedures that quantify the signs and symptoms that appear upon termination of chronic administration (2, 4). In fact, the original (and erroneous) idea that cocaine was a nonaddicting drug was based on early observations that it failed to produce marked physical dependence—in spite of its pronounced liability for abuse. Under the ominous term "addiction," the