needed to cover a science convention than are now available or readily foreseeable. . . . The Information Explosion might be controlled somewhat by having a few official publications and many informal ones. . . . In framing a report, a scientist might ask himself the two questions that a city editor often asks a reporter: (i) What does this mean? and (ii) Why is it important? . . . The answers might enable one to weave together the import of many disparate papers, sometimes a help in answering the question "Where is science taking us?"

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Priority Questioned

We believe that Henry A. Bent has himself contributed to the mythology of the noble-gas compounds in his book review, "Birth and death of a myth" (27 Mar., p. 1425). The record is clear. The "noble myth" of the nonreactivity of the inert gases was not laid to rest by the well-advertised XeF_4 crystals, but by the salt $XePtF_6$, astutely prepared by Neil Bartlett, University of British Columbia [*Proc. Chem. Soc.* **1962**, 218 (1962)].

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Insect Control by Nontoxic Means

Insects which depend on chemical "recognition signals" for mating, feeding, or oviposition, can be controlled (at least in principle) without the use of poisons if the environment can be so permeated with a sex-attractant chemical, for example, that the small additional quantity emanating from a female is imperceptible (*1*).

Quantitatively, the process is at once technically possible and economically attractive, thanks to the very high biological potency of the sex-attractant chemicals (*2*). For example, if the threshold concentration is taken as 10^3 molecules of scent per cubic centimeter (1 molecule per cubic millimeter), and if it is assumed that a concentration a hundred thousand times higher than this will completely saturate or fatigue the receptor organs of the male, then the concentration required is 10^8 molecules per cubic centimeter. This corresponds to 1 gram molecule dispersed in 6×10^{15} cubic centimeters, or 6 cubic kilometers of air. If we assume a wind of 5 kilometers per hour blowing steadily for 10 days across a line 1 kilometer long, and if this air stream is permeated at the postulated concentration to a depth of 50 meters, the total volume of air to be treated is 600 cubic kilometers, and the quantity of chemical required is 100 gram moles. With a molecular weight of 200, this is only 20 kilograms of chemical, and if the effect is felt for 1 kilometer downwind from the release line, the total application for the entire 100-day period is 200 grams per 1000 square meters. This is interesting both technically and economically.

The practical problems in maintaining such a condition need not be insuperable, more especially if the air does not have to be permeated 100 percent of the time—and the indications are that it would not (*3*).

In contrast with control by toxic chemicals, the process offers the prospect of complete extermination of a pest species, for two reasons: (i) insect strains "resistant" to a sex attractant are not likely to arise; and, (ii) the lower the population density the more does successful mating depend on sex-attractant scents, and the more devastating will be the effect of any interference with them.

The normal biological role of these recognition chemicals requires that they be species-specific. Moreover, they are not usually toxic, and in any event their effect can usually be duplicated if necessary by a chemically unrelated material (*4*). Therefore, it should be possible to find completely harmless chemicals to use in this way against any particular insect pest.

Notwithstanding these manifest advantages, the chemical industry is apparently reluctant to develop this technique partly (perhaps wholly) because the cost of developing a pest-control chemical and passing it through all the tests needed to satisfy the various public health authorities is between $1 and $2 million. If one wide-spectrum chemical can be cleared in this way and then used against a wide range of pests, the development cost can be recovered; but if each species is to be controlled by a different chemical, and if each chemical must be checked out at a cost of $1 million, then the development costs cannot be so recovered.

Thus it appears that regulations designed to protect the public against the indiscriminate use of toxic chemicals are quite unintentionally having the effect of inhibiting research that would be expected to replace many wide-spectrum toxicants with species-specific and nonpoisonous control agents.

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Noise, Annoyance, and Progress

The letter by H. A. Denzel ("Noise and health," 6 Mar., p. 992) reflects a prevailing misconception of human behavior. This misconception sees any kind of sensory stimulation which is other than pleasing and comforting as somehow deleterious to human health and welfare. Such stimuli would include not only noise but also cold, heat, pain, and so forth. The letter points to the low ambient noise level of a stone-age culture and a mental hospital as representative of a desirable state of affairs. The letter does not suggest the possibility that the very primitiveness of these two environments might be a price that would have to be paid for this sensory deprivation. It would be more valid to raise the issue that annoying stimuli have a constructive rather than a destructive effect on human behavior, being related to the very progress which is characteristic of civilized technology in an etiological way.

In a broader context, there tends to be an erroneous conception prevailing which equates discomfort with ill health. It would, however, be extraordinarily naive to assume that, because ill health sometimes produces discomfort, discomfort produces ill health. Sleep is often used, again erroneously, as an index of health or other desirable states of being. Actually, sleep is more profitably viewed as a consequence of boredom, and not necessarily the most desirable way to react to boredom.

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