Plant Science Research

For many years my research on "unusual" plant amino acids was supported by the Agricultural Research Council of Great Britain. Because certain of these amino acids, such as L-dopa, 5-hydroxy-L-tryptophan, and the lathyrogens, are of obvious importance in medicine, I have been able to continue this work in the United States with the welcome assistance of the National Institutes of Health.

Such a direct relationship between the plant sciences (see Editorial, 18 June, p. 1195) and medicine is not always apparent, however, and the most immediate beneficiary of basic botanical research is likely to be agriculture. It would seem appropriate, therefore, to ask whether the Department of Agriculture should not reconsider its policies for financing research in the basic plant sciences.

Help in the form of grants to individual scientists in institutions not directly affiliated with the Department of Agriculture would, I believe, produce rich returns in this relatively unexploited field. Agriculture, medicine, and industry are all likely to benefit, and reinvigorated departments of plant science would in turn raise the quality of graduates available for recruitment by the Department of Agriculture itself.

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Leukemia, Radiation, and Hyperthyroidism

Saenger *et al.* (Letters, 19 Mar.) argue that hyperthyroidism per se is responsible for the statistically significant increase in leukemia death rate which they observed in a *combined* group of 18,379 radioiodine-treated (RIA) and 10,731 surgery-treated (SUR) hyperthyroid patients (*1*). For the years 1946 to 1964 this increase amounted to 1.5 times the expected death rate calculated on the basis of the experience of the U.S. general population. I have examined the origins of this increase by comparing observed numbers of leukemia deaths in each patient group with the corresponding expected numbers calculated on the basis of U.S. age-, sex-, and year-specific leukemia death rates (*2*). The results show that the excessive leukemia death rate is largely confined (i) to patients who were over 50 years of age at the time of treatment; (ii) to patients with the acute rather than the chronic form of the disease; and (iii) to the RAI rather than the SUR group. Moreover, in RAI patients there is a statistically significant excess of acute leukemia deaths (*2*) occurring between ages 50 and 79 (namely, 9 observed versus 3.6 expected; $P = .01$); whereas, in SUR patients, although there is an excess of such deaths between ages 50 and 79 (4 observed versus 2.5 expected), the excess is not statistically significant (*3*).

The experience of the RAI patients suggests, but of course does not conclusively establish, that doses to bone marrow which are estimated to be 7 to 13 rads (*1*) and which are delivered at relatively low rates can induce acute leukemia at a relatively high rate per rad in adults over 50 years of age. This may not be so surprising as it seems, since not only is acute leukemia the type that predominates after radiation exposure, but Doll (*4*) has shown that in a group of adult spondylitic patients in Great Britain radiation-induced leukemia rates (standardized for a constant dose) increase exponentially with age in the same way that spontaneous rates in that country increase with age. Doll's findings and the data of Saenger *et al.* are in agreement in suggesting that the sensitivity to radiation-induced leukemia of older adults in Western countries may reach or exceed the relatively high sensitivity (*5*) which characterizes the fetal stage in such countries.

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References and Notes

1. E. L. Saenger, G. E. Thoma, E. A. Tompkins, *J. Amer. Med. Assoc.* **205**, 855 (1968).
2. Based in part on unpublished data on the age-composition of each group supplied by Saenger *et al.* and unpublished tabulations of acute leukemia deaths (under rubric 204.3) in the United States supplied by the National Center for Health Statistics.
3. Saenger *et al.* (*1*) only attempted a comparison of the leukemia experience of the RAI group with that of the SUR group after adjusting for age by the so-called direct method. This method lacks the power to detect even large differences between the two groups, since the number of deaths from acute leukemia, especially in the SUR group, is too small to calculate meaningful age- and sex-specific rates.
4. R. Doll, *Br. J. Radiol.* **35**, 31 (1962).
5. A. Stewart and G. W. Kneale, *Lancet* **1970-I**, 1185 (1970); B. MacMahon, *J. Nat. Cancer Inst.* **28**, 1173 (1962).

Patients' Expectations

I enjoyed Abelson's splendid editorial, "Unrealistic demands on science and medicine" (4 June, p. 989).

In my early practice I tended to be flattered by the implicit and blind faith of some patients who expected miracles to come automatically. Because the practice of medicine is frequently able to achieve some miracles, it has become almost a guaranteed expectation of a patient.

The tremendous disadvantage that this has produced, especially in the malpractice field, cannot be too strongly emphasized. It is perfectly correct that fear of suit has adversely affected the practice of medicine in all too many instances. Most physicians, in fact, must now practice medicine "defensively." They must hold a lawbook in one hand and a stethoscope in the other. This has created fantastic problems and costs. For example, in one state in the Southwest, malpractice insurance premiums exceed $1000 a month for some specialists; this expense is inevitably reflected in costs of patient care and constitutes only one facet of a very large problem.

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With reference to Abelson's excellent editorial in the 4 June issue, I should like to direct attention to the statement made by the great rabbi-physician, Maimonides, about 800 years ago, as follows:

> If man were to conduct himself as he manages the animal he rides, he would be safeguarded from many ailments. That is, you find no one who throws fodder to his animal haphazardly, but rather he measures it out to her according to her tolerance. Yet he himself eats indiscriminately, without measure. Moreover, he takes into consideration the activity of his animal and exercises her, so that she does not stand still forever and be ruined. Yet, he does not do this for himself, or pay attention to the exercise of his own body, which is the cornerstone of the conservation of health and the repulsion of most ailments (*1*, p. 17).

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Reference

1. A. Bar-Sela, H. E. Hoff, E. Faris, "Moses Maimonides' two treatises on the regimen of health," *Trans. Amer. Phil. Soc.* **54**, 1 (1964).