

Letters

Vitamin Therapy: Treatment for the Mentally Ill

The article, "Orthomolecular psychiatry" (19 Apr., p. 265), illustrates elegantly the pitfalls which occur when an expert in one field enters another area. With his characteristic brilliance, Linus Pauling describes a biochemical mechanism which *could* be responsible for some forms of mental illness (or, indeed, for illness of many other types). Remote plausibility, however, no matter how intriguing and creative its nature, should not be confused with evidence. Unfortunately for Pauling's thesis, there is no adequate evidence to back up his view.

Hypovitaminoses (albeit more gross than Pauling postulates) can result in overt psychopathology. But the characteristics of these disorders are qualitatively different; that is, they are clinically distinguishable from the large group of mental disorders considered by Pauling, including schizophrenia, whose etiology remains unknown. There are large numbers of mentally ill patients whose economic circumstances have permitted diets consistently abundant in vitamins at well above minimum daily requirements. Most symptoms include food faddism with heavy intake of vitamin supplements. The published reports suggesting that vitamin therapy may be useful in mental illness, several of them cited by Pauling, uniformly display serious methodological flaws. These include inappropriate sampling, inadequacy of controls for extraneous intake and for activity, or the effects of hospitalization per se, loose diagnostic criteria, the opportunity for observer bias, and like defects which render them less than useless. This point has been well documented by both Kety (1) and Benjamin (2).

If the topic were one of lesser social import and emotional investment, one might be tempted not to raise these issues. At worst, some scientific effort might be deflected from the investigation of what would seem, in light of present knowledge, to be far more

productive leads. But the suffering of the mentally ill and the distress of their friends and families creates a situation wherein every new "finding" appears to be a "break-through" which is grasped as a straw.

The work of Akerfeldt, which Pauling discusses, is a perfect case in point. Following initial reports, the "Akerfeldt test" was touted as a new diagnostic tool for schizophrenia, amid much public clamor. Subsequent research soon made it apparent, however, that the abnormality was related to the poor dietary intake of patients at public mental hospitals, and could be reversed by dietary supplements—*without*, it should be noted, altering the course of the schizophrenia. Indeed the history of that recent incident has become a classic case in the social psychology of mental health research; it is used as a prototypical example in teaching residents and students the dangers of lack of proper attention to adequate controls.

The article is replete with statements of personal belief and opinion. If the topic were in molecular biology, one could readily accept Pauling's credentials as a basis for holding such views. The elucidation of the α -helix was, after all, a brilliant intuition as well as being based on empirical data. But, while Pauling is widely knowledgeable and his chemistry may be impeccable, it is unfortunately evident that he is unfamiliar with the subtleties of methodology in a field in which he is untrained. Although this is entirely understandable, it would be regrettable if the impact of his prestige and brilliance in other fields led readers to believe otherwise and to accept unwisely what remains, on the basis of current knowledge, a wild speculation.

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References

1. S. Kety, *Science* **129**, 1528, 1590 (1959).
2. J. D. Benjamin, *Psychosomat. Med.* **20**, 427 (1958).

My associates and I have carried on research on the molecular basis of mental disease for 12 years, with the support of grants from the Ford Foundation, the National Institutes of Health, and private donors. For 10 years I have been aware of the opposition of many psychiatrists to the idea that patients might benefit by having a supply of vitamins and other nutrients differing from that recommended for the "average" person. This opposition is clearly expressed in Oken's letter.

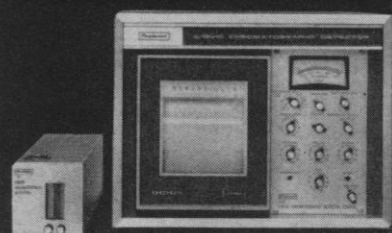
There is danger associated with most drugs and other forms of therapy, such as electroconvulsive therapy. A physician has the duty not to impose this danger on a patient unless, in his opinion, the probable value of the treatment to the patient exceeds the probable harm that it would do to the patient. New synthetic drugs should be very carefully tested before they are brought into general use.

The situation is different, however, for ascorbic acid, nicotinic acid, nicotinamide, and some of the other substances required for life that are mentioned in my paper on orthomolecular psychiatry. They are nontoxic (as safe and nontoxic as sucrose and sodium chloride); they are cheap, so that the treatment of the patient would cost only a few cents a day; and they have fewer side effects than the drugs that are ordinarily prescribed. For each mental patient there is a significant probability that improvement in health would result from the provision of the optimum amounts of these nutrients, in addition to whatever other therapy the psychiatrist might propose. There is a very small probability of damage to the patient by these nutrients, far smaller than for ordinary drugs.

I believe that a psychiatrist who refuses to try the methods of orthomolecular psychiatry, in addition to the usual therapy, in the treatment of his patients is failing in his duty as a physician.

Several of the points made by Oken are adequately discussed in my paper; for example, his statement that "there are large numbers of mentally ill patients whose economic circumstances have permitted diets consistently abundant in vitamins at well above minimum daily requirements," leading to the inference that these patients could not be suffering from cerebral avitaminosis. Oken, like many other physicians, ignores the fact that different persons differ from one another in

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their molecular structure, and that the so-called "minimum daily requirement" of a vitamin may be far less than the optimum daily amount for some people.

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Small Grants—Great Value

I was very pleased to see Abelson's editorial, "LSD and marihuana" (15 Mar., p. 1189). The citations from *LSD, Man and Society* (1) were further evidence that the symposium and the publication were worthwhile. Yet I wish we could give some recognition to the Department of Health, Education and Welfare and specifically to the National Institute of Mental Health Small Grants program which supported the symposium and thereby made the book possible. Such support has great educational value. By continuing support of symposia designed to produce authoritative materials for the nonexpert, HEW can become one of the powerful forces in education in this country.

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Reference

1. R. C. DeBOLD and R. C. Leaf, Eds. (Wesleyan Univ. Press, Middletown, Conn., 1967).

Cold Spring Harbor Symposia

Waldo Cohn, of the Biology Division at Oak Ridge, has questioned the value of publishing the Cold Spring Harbor Symposia (Book Reviews, 12 Apr.): "Although the volume has some reference value to the cognoscenti as noted above, the delay and expense of producing it give rise to serious questions as to the value of the effort. . . ." Since I was somewhat involved in the production of the book, I am in a good position to say something about the "delay," "expense," and "effort."

The book was completed and dispatched in 9 months; usually less time is needed, but we struck an extreme vacillator among our contributors (who shall be nameless) and our lenience toward him cost us 2 months. I do not know how this compares with other published symposia. The most recently

published Oak Ridge symposium took longer to come out, as I know because I contributed to it, even though it is much shorter and its organizers are less lenient with contributors than we are. Since we sent a review copy of the symposium to *Science* on 5 May last year, it seems that we produced the book in less time than it took *Science* to publish a review of it.

The "expenses" Cohn mentions are nonexistent. The production costs are covered by the sales, and the exercise of publishing the book receives no subsidy of any kind. Yet, despite its unusually large format, the symposium volume was, per page, among the cheapest books reviewed in the 12 April issue of *Science*.

As to the "effort" involved, this is more for me to worry about than for him or his readers. Any doubts I may have on this score are, however, partly allayed by the first reference given in the longest article in that same issue, which reads: "1. For a comprehensive picture of the extensive work on this subject, see 'The genetic code,' *Cold Spring Harbor Symp. Quant. Biol.* 31, entire volume (1966)."

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Potential Teachers

The shortage of science teachers (Letters, 9 Feb. and 12 Apr.) cannot be easily met, but one available source might be the number of federal employees who are eligible to retire at age 55 when they have had 30 years service. Many of these, engineers, scientists, and architects, who are contemplating retirement, would welcome the opportunity to teach science and mathematics. But often these potential teachers remain in government work because they cannot arrange to upgrade their training to meet modern requirements.

There must be ways to utilize this pool of untapped teachers. One solution would be to grant sabbaticals to government workers prior to retirement age, so as to enable them to get in-service teacher training and make plans for a smooth transition from government to the classroom.

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