

## Medicine and Books

### Cure for all ills?

*Vitamin C, the Common Cold, and the Flu.* Linus Pauling. (Pp 230; £7.20 hardcover, £2.60 soft cover.) W H Freeman and Company. 1977.

Linus Pauling is a truly remarkable man, apparently much liked by those who know him. He has to his credit tremendous scientific achievements, and when he was at the height of his powers as a chemist he would solve difficult problems while others were gathering their forces to attack them. In 1970 he published a book advocating the use of vitamin C for the prevention and cure of the common cold and he has now produced a sequel. This seems to be intended as a popular book, for it is written in an admirably lucid and concise style assuming little or no previous knowledge of the subject. Unlike most popular books it contains a detailed and up-to-date bibliography and also appendices with quite detailed accounts of certain scientific papers. The chapters are to some extent what one would expect; very brief accounts of the aetiology of the common cold, influenza, scurvy, and of the functions of ascorbic acid. He argues (on a basis of evolution and some animal experiments) that man really requires gramme quantities of ascorbic acid to be as healthy as animals that synthesise their own vitamin C or consume large amounts of vegetation, and he considers that giving this is part of what he calls "orthomolecular medicine." There is an interesting chapter on human biochemical individuality, and on the side effects of taking large doses of vitamin C, in which he shows quite clearly that some of the criticisms of his regimen are invalid or ill informed. He then compares drugs and vitamin C and describes "How to control the common cold and the flu." Sandwiched among these chapters is another of a different sort entitled "The Medical Establishment and Vitamin C," in which he castigates all those who have disagreed with him and uses phrases like "intemperate" and "false" to describe their writings and opinions.

#### Little progress

What has gone wrong? The idea that vitamin C might be good for colds was old before Linus Pauling took it up, and one might reasonably expect that the entry of such an eminent scientist into the debate would enhance its standard and rapidly resolve the problems. Yet this has not happened. Why?

Firstly, the participants seem to have very deeply held views—so deeply held that in some ways they are not open to argument. Science often advances when one man has an idea, a hypothesis, in which he believes strongly enough to work hard and long gathering evidence to prove it. Yet he is not truly scientific if he is unwilling to acknowledge that the evidence as it comes in is conflicting or against him and that, therefore, his idea may be or must be wrong. This first reason is linked to the second—namely the poor quality of much of the scientific information and its assessment. Neither side has a monopoly of this and Pauling explains well how poor assay methods gave rise to a claim that large doses of ascorbic acid might give rise to deficiencies of vitamin B<sub>12</sub>. He is not uncritical of those who are pro vitamin C, for he says that he cannot assess the papers of Wilson and Loh because of the way they are written. Yet he repeatedly states more than the evidence proves. On p 128, for instance, he argues that a claim that vitamin C did not

reduce colds in a certain experiment is "not quite true" as the data show a reduction of 6%; in the appendix on p 185 we are told that this represents the difference between 18/47 and 18/44—within the ordinary framework of scientific and statistical usage, the statement that the number of colds was not reduced *is* "quite true" and an irrational bias has clearly led to overinterpretation, if not to plain misinterpretation.

The truth is that although some trials appear to have shown a weak effect of vitamin C against colds, properly designed trials have usually shown little or none, and were this a trial of a new antibiotic against a bacterial infection it would be regarded as of no clinical value. Likewise he gives up half a page to a letter in his favour written (a few years before he died) by a long-retired scientist, which includes several erroneous statements. Furthermore, he attributes his own longevity and vitality to taking the vitamin and he is optimistic about using it for treating schizophrenia, heart disease, and cancer, though he does avoid making specific claims. But he does claim that vitamin C will prevent bacterial complications of influenza as well as the disease itself, and also the side effects of vaccination. It has been proved that supplements of vitamin C can reduce the susceptibility of vitamin-deficient subjects to bacterial infections, but I know of no relevant evidence that they would prevent influenza or the side effects of vaccination in the population of the USA or the UK.

#### No balanced view

This brings us to a sad and possibly dangerous aspect of this book: this is that, though it is clearly directed at the general public, it presents not a balanced account of a difficult problem but an overstated and partisan view. Pauling's Nobel prizes and other major honours are listed on the cover, together with an engaging portrait of him at work in his laboratory. Underneath, in quotation marks, is the statement, "In 1976-1977, when another swine-flu epidemic is expected, it is especially important that everyone know that he can protect himself to a considerable extent against the disease and its consequences by the use of this important nutrient, vitamin C." The man-in-the-street who reads this is likely to believe that it is a summary of truth emanating from the highest scientific authority and a newspaper review by a non-scientific reviewer (*Sunday Times*, 6 March, 1977) takes the line that the scientist Linus Pauling has presented all the evidence that vitamin C prevents and treats colds and that only stupid and prejudiced doctors oppose him. It is probably not as easy as Pauling suggests for the man-in-the-street to get vitamin C cheaply and, at best, he is likely to spend money on this which would be better spent on a good mixed diet; at worst, he may treat himself to no avail with vitamin C when he has a condition which urgently requires orthodox medical treatment.

A review of this length should reveal the pleasure of the reviewer in the book. I can admire the continued abilities and lucid writing of a great scientist who contributed much to chemistry but I grieve that he never learned how clinical evidence should be collected, sifted, weighed, and applied in this context.