

Orthomolecular Medicine Advances into the Mainstream

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Medical innovation falls into two main classes: (1) major discoveries which create a paradigm shift in medical philosophy and treatment, and (2) minor discoveries which expand upon and exploit the new paradigm. Inevitably, there are few major discoveries and a large number of minor ones. These are minor not because they have little significance to diagnosis and treatment, but because once the major paradigm shift has occurred any one of a number of scientists would have made the same discovery. The leading role played by the new paradigm is bolstered at first by the host of minor discoveries, but eventually these destroy the major paradigm which is replaced by a new and better one. Unfortunately, the major paradigm (generally accepted theories and hypotheses) may rule long after it has served its usefulness. It then becomes a major impediment to newer discoveries.

It may take anywhere from 40 to 60 years or more after the first major assault on the old paradigm before it has been replaced by a newer one. This long interval between discovery and its application is very costly. In chemistry the delay is about half of this interval and for physics it is even shorter. Where there is an easily defined bottom line, there tends to be a much shorter gap between these events. An early example was the 40 year gap between the discovery by Sir James Lind that oranges and lemons would cure scurvy and the distribution of limes to English sailors. During this interval 100,000 seamen died from scurvy; there are many similar examples.

A current example is the slow pace in which the vitamin paradigm of nutrition is being replaced by the Orthomolecular paradigm. Vitamins have never been embraced warmly by the medical profession. The vitamin deficiency paradigm began in the late 19th century and was first clearly enunciated at the turn of that century. Professor Elmer

McCollum demonstrated that Vitamin A would cure and prevent xerophthalmia. But he had to bypass the medical profession by lecturing directly to the public about his discovery. He was very unpopular for awhile. Dr. J. Goldberger proved that pellagra was caused by diets deficient in a nutrient factor present in protein and grains. In 1935 this was found to be Vitamin B-3 (niacin and/or niacinamide). Yet as late as 1950 a textbook of Gynecology and Obstetrics stated that it was "alleged" that Vitamin B-3 would cure pellagra.

It appeared as if vitamins had finally taken hold between 1935 and 1945 after several Nobel prizes had been given to the pioneers in the discovery of the vitamins. But the War, the subsequent discovery of the antibiotics and a little later the "wonder" drugs, the steroids, effectively quenched any interest in vitamins as part of the medical armamentarium. By now the vitamin paradigm was firmly established, i.e. they were useful only for preventing the classical deficiency diseases such as pellagra, scurvy, beri beri and were needed only in small vitamin doses.

The vitamin paradigm is based upon the following propositions: (1) small doses of vitamins will prevent deficiency diseases; (2) these doses will be found in a well-balanced diet. It then follows that: (1) doses larger than those needed to prevent deficiency diseases are not needed and in fact may be harmful; (2) diseases not known to be vitamin deficiency diseases will not be helped by the use of vitamins; (3) people eating a well balanced diet should not and do not need to take vitamin supplements.

The first attack on the vitamin paradigm was so soft almost no one was aware of it. About 1935 pellagrologists showed that chronic pellagrins needed over 600 mg of niacin before they remained free of the symptoms of pellagra. This was surprising since only less than 20 mg daily will prevent pellagra, and doses very little larger than this will eventually cure pellagra. They also showed

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that dogs made pellagrous by a prolonged vitamin deficient diet developed chronic pellagra (called black tongue in dogs), and did not recover until they were given much larger doses than those required to prevent black tongue.

The second assault on the vitamin paradigm came from Drs. Wilfred and Evan Shute, who showed that vitamin E was therapeutic for many forms of heart disease and accelerated healing from wounds and burns. This work was never subjected to an adequate corroborative process and yet was widely rejected by all the medical establishment. There were two main problems with it. Vitamin E was not accepted as a human vitamin because there was no vitamin E deficiency disease. In medical school, lecturers have been known to remark lightheartedly that vitamin E was a substance searching for a disease to call its own. Secondly, heart disease was certainly not a Vitamin E deficiency disease, nor were burns or wounds. Thus two main elements of the vitamin paradigm proved that Vitamin E could not possibly have the therapeutic activity the Shutes had claimed. They were deluded or, in modern times, this would be called a placebo reaction. There were too many patients (over 30,000) who responded, to look upon this as examples of spontaneous recoveries.

The third blow to the vitamin paradigm was the discovery by Dr. William Kaufmann (1943, 1949) that vitamin B-3 given in gram doses was therapeutic for many of the forms of arthritis. Arthritis has not been considered a vitamin deficiency disease, and the doses he used were 300 times the doses needed to protect against pellagra. However his work was not accepted, and remained generally unknown. It therefore had little impact on the vitamin paradigm.

The fourth assault on the vitamin paradigm was also the first one to have a major impact on medical theory. Dr. Humphry Osmond and I had been using large doses of Vitamin B-3 and Vitamin C since 1952, for treating schizophrenics and a few other psychiatric diseases. I was interested in the side effects and possible toxicity of these vitamins since we were maintaining patients on these doses for many years. I persuaded Prof. R. Altschul to examine niacin in his cholesterol studies with rabbits. He found it lowered cholesterol levels in his animals made

hypercholesterolemic by feeding them cooked egg yolk. Altschul, Hoffer and Stephen (1955) reported that it also lowered cholesterol levels in people. The cholesterol hypothesis of atherosclerosis was becoming established, and companies and physicians were searching for compounds which would lower cholesterol; one small company had spent over one million 1954 dollars and had failed to find an equivalent substance.

The finding that niacin lowered cholesterol was soon confirmed by the Mayo Clinic. A few years later niacin was approved by the FDA as a hypocholesterolemic drug and the first vitamin entered the mainstream of therapeutics in medicine. It was the first vitamin accepted in large doses (forbidden by the vitamin paradigm) for a condition known not to be a deficiency disease. It was finally established by the Coronary Drug study, Can-ner et al (1986), which proved that niacin given for many years to men having had one coronary, decreased mortality by 11 percent and increased longevity by two years. Today niacin is firmly established as an economical, safe substance for lowering cholesterol and for raising HDL. Of course, it has many other beneficial properties as well, Hoffer (1984, 1989).

Our 1955 report marks the beginning of the Orthomolecular paradigm, i.e., that vitamins in optimum (large) doses are therapeutic for a variety of conditions not considered to be vitamin deficiency diseases. We had also demonstrated that vitamin B-3 in large doses was therapeutic for the schizophrenias, Hoffer, Osmond, Callbeck and Kahan (1957); Hoffer (1984, 1988, 1989, 1990, 1993).

This assault on two major paradigms, the vitamin paradigm and the schizophrenia paradigm, has not received the same acceptance, but I am not surprised since psychiatry tends to lag several decades behind the other fields of medicine.

The major and most effective assault on the vitamin paradigm was made by Linus Pauling with his publication of his paper in *Science* (1968) on Orthomolecular Psychiatry, and his subsequent publications on the common cold (1970, 1976, 1986); on cancer, Cameron (1991), Cameron and Campbell (1974, 1991), Campbell, Jack and Cameron (1991), Cameron and Pauling (1979), and Hoffer and Pauling

(1990); and very recently on atherosclerosis and heart disease, Pauling and Rath (1991), Rath and Pauling (1991, 1991a).

Pauling was introduced to the importance of vitamin C by Dr. Irwin Stone, and thereafter his own vast research investigations persuaded him that he was correct. Every human suffers from the disease known as hypoascorbemia, as we do not have the capacity to synthesize it in our body, in sharp contrast to most other animals who can and do make megadoses, up to over 12 grams per 100 pounds of body weight, ranging from flies to elephants. Pauling showed how the ability to synthesize vitamin C was lost during evolution and what has been the consequence to humanity ever since.

With the usual vitamin quantities available even in the most perfectly balanced diet we can achieve a state of poor health, better than having scurvy, but not as good as the optimum health which can be achieved by large doses called megadoses by Irwin Stone. Later the practice of using megadoses became known as megavitamin therapy. This word was anathema to the critics but became part of the general vocabulary.

A paradigm is overthrown by a newer one when information about the paradigm becomes known to a substantial body of the establishment. Information follows a growth curve, well-known in biology. If one seeds a glass of sterile milk with one million lactobacilli which will eventually turn it sour, nothing appears to happen for a long time, perhaps for days, depending upon the temperature. Then suddenly it curdles. What has happened is that the bacteria have been dividing at a rapid pace, but only when enough lactic acid has been generated by that colony will the milk curdle. The phase where nothing appears to be happening (but in fact the bacteria are growing rapidly) is called the lag phase. Just before and during the curdling process the growth appears to accelerate, and after that growth diminishes as the bacteria run out of food. The growth curve has a slowly ascending lag phase, then a rapidly ascending phase followed by a phase where growth levels off and stops.

Information growth follows a similar pattern of growth. We have been in the lag phase for about 40 - 60 years, but we are now entering the phase of rapid growth. It may take another 5 to

10 years before we reach the stage of maturation, except of course in psychiatry, which is many years backward. I believe the ascending phase begins when about ten percent of the professional population is convinced there is merit to the new ideas. By then perhaps 50 percent of the general population is convinced.

The vitamin paradigm has resisted stoutly using every means, fair and foul, at its disposal, including lies manufactured by its stoutest defenders who generate toxicity of vitamins where none have ever been shown to exist.

The establishment press has provided the defenders of the paradigm ample space in which to promote their views, and has been equally assiduous in rejecting information from the Orthomolecular camp who are attacking the paradigm.

Last year, 1992, marked the final assault on the vitamin paradigm, at least in medicine. Some indicators were the report in the New York Times and a few days later in Time Magazine. Both of these magazines have been noted for their stout defense of the vitamin paradigm. Another was the Nutritional Medicine Today Conference in Vancouver in May 1992 which was attended by over 60 physicians, comprising more than half the number participating. This is the first time this has occurred. The last indicator I will discuss was the meeting in November 1992 in Tulsa, Oklahoma.

This two day meeting, entitled "Adjuvant Nutrition in Cancer Treatment", was sponsored by the American College of Nutrition and the Cancer Treatment Centers of America. It was organized by Dr. Patrick Quillin, Vice President of Nutrition for the CTCA, and was held in the Cancer Treatment Centers of America Hospital in Tulsa.

The symposium was remarkable because it brought together representatives from many universities and cancer research institutes and Orthomolecular oncologists, including Linus Pauling who gave the main address and received an award from the CTCA. The following universities were represented: Bard College, Harvard, Tufts, UCLA, McGill, Toronto, Pennsylvania, Johns Hopkins, and Colorado. The following cancer institutes were represented: the National Cancer Institute, American Institute of Cancer Research, Palo Alto

Institute Molecular Medicine, Dana Farber Cancer Institute, Simone Cancer Center, and the Cancer Treatment Centers of America. There were 28 presentations. Physicians at this meeting came from seven countries including the U.S., Canada, Australia, Germany, China, and Spain.

The meeting was skillfully organized, beginning with basic research and ending with the clinical applications of Orthomolecular treatment to cancer patients. Professor Linus Pauling described his journey from molecular medicine, to vitamin C and the common cold, to the present concept of Orthomolecular medicine. He was given a standing ovation for his address. The participants were alert, enthusiastic, informed, friendly and there were very few who fell asleep during the presentations. Most of them were still there the last afternoon of the meeting.

There were five main sessions. The first and second dealt with an overview of the connection between nutrition and cancer. It is clear that they are related. We were also told that the xenobiotic war (surgery, chemotherapy and radiation) was not going well. The third session dealt with parenteral nutrition as part of cancer treatment. The fourth session was devoted to a discussion of recent research relating various nutrients, such as vitamin C, vitamin A, vitamin E, fatty acids, vitamin K, food and botanical extracts and other factors, to cancer. The final session was the clinical one with presentations from Dr. C. Simone, Prof. Rudy Falk, and myself, detailing the results we had seen by the incorporation of nutrition and nutrients, especially vitamin C in very large doses. The proceedings will be published.

It is time we gave the vitamin paradigm a decent and honorable funeral. This should have been done about 20 years ago. An enormous number of patients would have benefited from the newer paradigm. It is impossible to estimate the enormous cost we have had to pay, because of the inertia and the ability of a deadly paradigm to suppress the development of a newer, more helpful one. It should not be beyond the wit of science and the public to devise a system by which this enormously long delay in the examination of new ideas can be reduced, from the usual 40 to 60 years to perhaps ten or so years. This will be the only way by which the enormous health

care costs in our society are ever going to be contained and eventually decreased.

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