



History of Orthomolecular Psychiatry

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Definition of Orthomolecular Psychiatry

Many physicians have contributed towards the concept of Orthomolecular psychiatry, but the entire work was coordinated into a medical science by the definition proposed by Dr. Linus Pauling (1968), who defined it as follows: Orthomolecular psychiatric therapy is the treatment of mental disease by the provision of the optimum molecular environment for the mind, especially the optimum concentrations of substances normally present in the human body. This definition allowed many physicians who were working in allied areas to come together and work toward a common goal. The range of Orthomolecular psychiatry extends from some of the neurological conditions like multiple sclerosis to the most clear-cut psychiatric condition such as schizophrenia.

The treatments required to optimize the molecular environment for the cells, especially the brain, include vitamins and minerals, both as components of

foodstuff and as supplements to it. They also include a consideration of foods from the point of view of its beneficial aspects and from the point of view of its toxic aspects, that is, the propensity of some food to be allergenic for some people.

How Dr. Linus Pauling Got Involved

Dr. Pauling has been interested in the relationship of molecules to medicine for many years. This interest was greatly accentuated by his discovery of the abnormal molecule present in sickle cell anemia. He had also investigated the molecular basis of certain mental diseases, especially mental deficiency. However, his interest was rekindled after he retired at age of 65. About this time he saw a copy of our book entitled, **How To Live With Schizophrenia** (1966). This renewed his interest, and he went back to work at the University of California in San Diego. After a careful examination of all the literature he concluded that the criticism of the megavitamin approach was not founded upon scientific data, and for this reason he and his staff began

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to examine it more carefully. The paper which he subsequently published in 1968 in **Science** is now a classic. It provides a theoretical formulation for the requirement for excessive quantities of vitamins for certain people. He also showed how an organism could drop the machinery necessary to the synthesis of very important vitamins even though less than adequate quantities might be present in that individual's diet. His importance in the field of Orthomolecular psychiatry has therefore been immense, not only because he placed his scientific reputation behind the work that we had done, but also because it provided a theoretical rationale for some of the research we are engaged in now.

Roots

1. Megavitamin Therapy (a) Practical

The early pellagrologists, that is, experts in the treatment of pellagra, used small quantities of vitamins. It occurred to some of them that higher doses might be of some value, but they were still astonished when they found that some chronic pellagrins required as much as 600 mg of nicotinic acid per day to prevent recurrence of their pellagra symptoms. It is undoubtedly true that they must have gone up to as high as 1 or even 1¹/₂ grams per day in running their tests. It is well known that the earlier experiments were conducted in mental hospitals where it was practically impossible to distinguish between the chronic schizophrenics and the chronic pellagrins who might be in the same ward, and some of these patients received these quantities.

It is easy to understand why they would not give very many people high quantities of vitamins for a long time because in those days, that is during the depression, they were extremely expensive and there were few research budgets which would permit physicians to try these vitamins. However, they were able to demonstrate the value of these vitamins for the typical pellagra psychosis. There was then a gradual

extension into the general field of psychiatry.

Today it seems to me almost inevitable that as soon as the price of these materials came down and as soon as major research grants became available some independent and curious physicians would be interested in trying out larger than recommended quantities for various diseases of unknown etiology. There were in fact several papers in the literature where up to 1 to 1¹/₂ grams per day of nicotinic acid or nicotinamide were given to a group of so-called depressives. There was a substantial response. Since it is well known that a number of people diagnosed depression are in fact schizophrenic, it is amply clear that they were the first to see the response of some schizophrenics to megavitamin B3 therapy.

However, the first person to systematically use larger quantities was Dr. William Kaufmann (1949) who used 3 to 4 grams of nicotinamide per day for the treatment of various forms of arthritis. By 1949 he had published a couple of volumes in which he described on a large number of cases the beneficial effects of this vitamin. This work was ignored because it had to compete with the introduction of the wonder drug, cortisone, which had an ample budget for its promotion. No one was interested in the promotion of vitamins. It was about this time Dr. Osmond and I began to use 3 grams per day and more of nicotinic acid for the treatment of acute and subacute schizophrenic patients. This led to the use of vitamin B3 for many of our acute and subacute schizophrenic patients. It also led to the discovery of the beneficial effect of nicotinic acid in lowering cholesterol levels and later triglyceride levels. There has been a recent expansion of this work, as you will hear at this conference, into the treatment of other conditions. Nicotinic acid and nicotinamide are very fascinating molecules because of their many remarkable properties. One of the more remarkable properties may be their antihistaminic effect, which may be why

HISTORY OF ORTHOMOLECULAR PSYCHIATRY

this vitamin has some value in the treatment of cerebral allergies even though it may not lead to final recovery.

Ascorbic acid has had three main individuals who promoted its use in larger than average quantities. The first is Dr. Klenner (1973), who has been using this vitamin in dosages up to 50 - 60 grams per day for particularly dangerous conditions for perhaps the past 30 years. He has summarized his work in a volume and has recently written articles for the medical journals. This work was referred to by Dr. Irwin Stone (1972) in his excellent summary of the properties and therapeutic potential of ascorbic acid, and of course it was finally popularized by Dr. Linus Pauling (1970) when he published his book, **Vitamin C and the Common Cold**. You will recall the tremendous attack upon Dr. Pauling for having published this work and for having summarized the medical literature. However, just about every control study which has come out since that time has been supportive to one or another of the claims made by Dr. Linus Pauling based upon his careful examination of the literature.

Vitamin E has had an equally difficult time in getting itself established. The pioneers have been Wilfred and Evan Shute (1969) who have been using it for the past 30 years on thousands of cases of cardiovascular disease with success. However, the attack upon the use of vitamin E has not abated, and just the other day in a recent issue of the **Journal of the American Medical Association** I read a letter by a physician who claimed bluntly that vitamin E was of value only for vitamin E-deficiency states, and of course these did not occur which meant that vitamin E did not have any clinical value. However, many of us have been using vitamin E with success. We will have to discount the criticism by physicians who are not familiar with what has been going on in this field.

The combination of vitamins A and D with bone meal has been developed by Dr. Carl Reich who has treated many thousands of

asthmatics and other allergic conditions with this combination. So far there have been no other publications supporting his work, but there are many of us who have been using the treatment with success. The pioneers in the parenteral use of vitamins have been Dr. Jonathan Coult in England who began to use parenteral vitamins for many conditions about 1955, and more recently Dr. Allan Cott who popularized this treatment especially for Orthomolecular physicians.

(b) Theoretical

There are two main theoretical roots, the first one developed by Dr. Linus Pauling who took an evolutionary point of view and described how it would be beneficial from the point of view of energy consumption for the cells of the body to utilize the essential nutrients available in their food rather than to have to synthesize them. This provides a rational basis not only for the need of high quantities of vitamins for certain people but also for some of the individual variations between various people. Dr. Pauling's assistant, Dr. Robinson, working with Dr. Pauling has taken a turn away from searching only for toxic chemicals which might be the cause of certain conditions and has been looking for abnormal patterns of normal metabolites. This seems to be a sensible approach and may indicate a new direction for research.

Dr. Roger Williams (1971) provided the second major root in demonstrating, first of all, the marked individuality of people with respect to their requirements for various nutrients and also for emphasizing the importance of the internal environment, that is the importance of the solution surrounding each cell. They must be provided with the optimum quantity of various nutrients if they are to conduct themselves in a proper manner. Anyone who is familiar with Dr. Roger Williams' work must surely understand the importance of determining the optimum dose for each particular individual. No general statement of requirement can be of any value whatever since it will certainly exclude a

large proportion of the population.

2. Minerals

The pioneer in this work is Dr. Carl Pfeiffer, who fortunately is with us today. He has emphasized and provided data to support his claims that it is important to have optimum quantities of minerals, that having too much mineral, for example, copper, lead, iron, cadmium, and so on, can be very toxic for some people, but on the other hand having too little of the essential elements like zinc, manganese, calcium, magnesium, and iron can be equally devastating. This work is only in its infancy, and undoubtedly over the next 10 to 20 years there will be major advances.

3. Major Foodstuffs

We have a very curious situation in North America and perhaps in the rest of the world. Over the past 100 years, especially in the industrial nations, there has been a remarkable drift downward in the nutritional quality of our food. It is true that sanitation has improved, but the availability of good nutritious food has gotten worse, and today it is very difficult even in the larger supermarkets for a person, unless he is exceptionally intelligent, to obtain a variety of food that can nourish him properly. Recently the Canadian government published the results of Canada's nutrition survey (Sabry, 1973) which I think every person interested in nutrition ought to read. Their conclusions are very pessimistic. They report that a large proportion of the population sampled were suffering from one or more nutritional deficiencies. Examination of their data shows that the proportion deficient tends to increase with age, so that it is rare for a person over age 65 not to be deficient in one or more factors.

For many years the governments of United States and Canada have been depending upon their so-called daily requirements and health rules or food rules to educate the public with respect to nutrition. In general the education has been misinformed and has been of such a nature that if drug companies were to issue the same

kind of advertising about their own drugs they would be quickly hauled into court. However, it is now likely that Canada at least will change its direction in public education. I look forward to the time when citizens can expect honest and accurate nutritional information from their governments.

The American government, especially through the F.D.A., has had a very pernicious effect in the area of food education. They have attempted to suppress those nutritionists and other people interested in good nutrition by ad hominem attacks. For example, physicians who recommended that patients should be treated with adequate or supernutrition were promptly labeled as quacks, and people who developed certain food habits because they discovered that on this particular kind of food they themselves felt better were promptly labeled as food faddists. They have been particularly severe on health food operators. It is true that many so-called food faddists have gone overboard simply because they themselves came to the erroneous conclusion that a diet which had been beneficial to them ought to be beneficial for everyone else. This counters the basic arguments put forward by Dr. Roger Williams. However, we must recognize the fact that even the food faddists may be correct for a small number of people if only they would realize that they ought not to promulgate these ideas for everyone or at least recognize that other people have different requirements. However, governments who have been attacking them have made more grievous errors since they lumped all these people together as food faddists without paying any attention to their message. I have always been amused by the amazement and anger of the doctors when they discover that people read books on nutrition and begin to treat themselves by nutritional techniques. They seem to have forgotten that many intelligent people can read, can understand, and can practice the science of nutrition perfectly well provided they are given

HISTORY OF ORTHOMOLECULAR PSYCHIATRY

accurate guides.

4. The Saccharine Diseases The major change in the development of current foodstuff is to process the natural foods into what is considered to be either more desirable or more palatable. We have seen the major effects of processing by which single elements of the food are extracted and made available in pure form. This includes primarily fats and carbohydrates. As a result it is now possible to obtain large quantities of fat and single carbohydrates; for example, sugar which is not being consumed as a portion of the whole original food has many undesirable consequences. The excessive consumption of fats can lead to a large number of conditions ranging from obesity to cardiovascular disease. The excessive consumption of carbohydrates, especially alcohol and sugar, can lead to a whole host of conditions from diabetes mellitus to the anxiety states and depressions commonly diagnosed as having relative hypoglycemia. The deficiency of fiber leads to a large number of bowel conditions including diverticulitis, appendicitis, and cancer. Processing also greatly increases the sodium content of foods and tends to decrease the potassium content, thus producing an inverted ratio compared to what is required. The effect of excessive sugar has been documented by Professor Yudkin (1972) and will be referred to later on. The total effect of consuming highly processed foods which include sugar, alcohol, and the cereal grains has been well described by Dr. Cleave, Campbell, and Painter in their book called, "The Saccharine Disease," which also will be referred to later on.

5. General

There have been general contributions to the Orthomolecular approach, especially by Dr. David Hawkins who has shown how to involve the community on a massive level. He has shown that the skillful use of tranquilizers and antidepressants in combination with megavitamins has been extremely helpful. Another

pioneer is Dr. Allan Cott, who has brought over the fasting techniques from Russia which have led to the present interest in the various food allergies, which are easily diagnosed, by a four-day fast. Dr. Cott has also pioneered the use of megavitamins for children and the use of parenteral administration of the vitamins. I should also refer to Dr. Jack Ward and Dr. Robert Meiers who have done a good deal of the basic work relating the hypoglycemias to schizophrenia and other conditions. Dr. Carl Pfeiffer has already been mentioned in connection with the minerals. He has also done pioneer research in developing accurate laboratory tests for diagnosing. I need only refer to Dr. Bernie Rimland who has done the most effective work in introducing the Orthomolecular approach to the vast group of children with learning and behavioral disorders.

6. Cerebral Allergies

I want to refer to the current interest in cerebral allergy which has been in the medical literature since Dr. Rinkel began to do his work. The greatest contribution has been made by Dr. Randolph who was interested in the general effects of allergy on physical diseases but had, over 10 years ago, accumulated 500 mental patients who were also sick because of their allergies. This work has recently been expanded by Dr. Marshall Mandell, by Dr. W. H. Philpott who fortunately is here today, and you will hear his work. This work has led to the diagnosis of allergies by using fasts of various durations, by using elimination diets, by using rotation diets, and eventually by using diets which eliminate the toxic foods and also by various forms of desensitization. You will hear some of these described here today by one of Canada's foremost allergists, Dr. I. Claisher, and by Dr. Glen Green, the rediscoverer of the condition subclinical pellagra.

Orthomolecular Approach

The Orthomolecular approach therefore works within the framework of the medical model, which has been described very clearly by Dr. Osmond

and his colleagues and includes the use of supernutrition, preferably not containing those foods to which that particular patient is allergic. It includes a proper consideration of vitamins and megavitamins if necessary. It also must take into account the proper use of minerals. If necessary, tranquilizers are used. It may well be that the tranquilizers work either because of their antihistamine effect or because they increase the quantity of coenzyme 1 in the body. It is well known that tranquilizers are rather weak antihistamines, but perhaps they are effective because they can be given in large quantities whereas the standard antihistamines produce too much sedation. The treatment also includes antidepressants which have recently been shown to be curative for pellagra, perhaps because they make tryptophan more available. ECT may have an antihistamine effect as has been suggested by Dr. Philpott.

However, the final aim of Orthomolecular therapy is to have a normal person without the need for either tranquilizers or antidepressants, but there is certainly no reason why they should not be used as long as they are necessary.

Future

(a) The future must include accurate diagnosis both based upon clinical examination and upon accurate laboratory tests. I think that we are just at the beginning of this, and I look forward over the next 20 years to a remarkable accuracy in diagnosing and treating.

(b) Treatment of the future will make sure that supernutrition is easily available for anyone who wishes it. This will be done by making available natural foods which are not contaminated by additives of which sugar, is a prime example, or which are not emasculated by taking out of them various components. If the foods are processed they will be carefully labeled in such a way that any person can easily determine whether that food is either good or bad for him. There will be a good and effective educational program, and

our public and high schools and our governments and Departments of Health will issue accurate information about nutrition. Inadequate foods may still be available on the market, but when this is the case they will have to be properly labeled with a cautionary warning such as: "Warning - this food does not make any useful contribution to your daily health."

(c) Consideration will have to be given to specific needs, for example, those people who are allergic, those people who require special vitamins, and those people who require special minerals. A special investigation will have to be determined to find out why there is a significant increase in the number of people who are allergic as it may well be that malnutrition carried on over a number of years might be responsible for a number of these allergic reactions. The fact that a number of vitamins have anti-allergy and antihistaminic properties suggests this is an area worth searching.

An Alternative Future

Every species of animal is adapted to its environment. The interplay of genotype and environment has produced the very variable phenotype — the human species. When the environment is changed, whether or not man is responsible for the change, there is a gradual adaptation to the newer environment and a new phenotype evolves. Man has adapted at least twice to major food environmental shifts and is now forcing himself to adapt to a third. The last 10,000 years or so have witnessed a major change from a hunting, foraging species to an agricultural society. The development of grains has been one of the main factors in the enormous increase in world population, in the development of cities, in short, in the development of our culture.

Ten thousand years is not long in the history of evolution. Over the past 50 years, and this has accelerated dramatically in the past 20 years, we have exposed

HISTORY OF ORTHOMOLECULAR PSYCHIATRY

ourselves to the third major change, i.e., the utilization of processed foods. I am convinced many of us are casualties of this newer development.

There are no statistics available to determine what proportion of our population suffers from malnutrition, which is directly attributable to this change. There are no surveys where any attempt has been made to get this data. This in itself is an indication of our lack of interest in this problem. It is possible, however, to obtain an estimate of the prevalence of malnutrition arising from excessive use of processed foods.

I have approached this problem from two directions. I consider the saccharine diseases which I will describe later as diseases of malnutrition. The other diseases are the avitaminosis, the vitamin dependencies, and the mineral deficiencies or excesses. Perhaps it will be shown that the allergies may also turn out to be forms of malnutrition. One can add up the number of patients discharged from hospitals from any region which are probably due to malnutrition. This will provide a gross underestimate since not every chronic patient is admitted every year.

In 1973, 220,000 patients were discharged from hospitals in Saskatchewan. Of this group 10 percent, in my opinion, are examples of chronic malnutrition. They include diseases of circulation, diseases of digestion, nutritional deficiencies, and so on. If these diseases of malnutrition had not occurred, our hospital costs could have been decreased by 10 percent. About 2¹/₂ percent of Saskatchewan population is ill enough from malnutrition to require admission to hospital. Another approach

is to sum the percentages of our population suffering from those chronic illnesses apt to be examples of nutritional deficiencies. These are shown in Table 1.

I would assume that between 2¹/₂ and 20 percent of our population suffer from chronic malnutrition. They are the result of tampering with our food. The proportion will grow rapidly as more and more people attain the status of 20 years of malnutrition or more. Many of the saccharine diseases appear after 20 years of excessive sucrose consumption.

Evolution will undoubtedly produce a species of man able to assimilate sucrose and other refined foods or a species of man whose appetite for sweets will be so altered they will no longer consume anything but the unprocessed foods of our distant ancestors. Those of us who do not adapt will be replaced and in the process will suffer from a variety of diseases of malnutrition. The costs will be a burden on the rest of society which remains well by virtue of a remarkable biochemical constitution able to utilize the processed foods, or because of their superior nutritional intelligence, or because of an inherited dislike for all junk foods.

The relation of corn and man provides an interesting example of intelligent nutrition and its impact on people. There are two general ways of preparing corn for food. It can be incorporated directly into food, or it can first be treated with alkali, preferably calcium. Corn, untreated, is not a high-quality food. Corn meal deprived of its embryo and outer layers (pericarp and aleurone) is even worse. The nicotinamide is in a fixed form and not absorbed in the intestine, and there is

TABLE 1 Percent of Population Ill

Senility	2%	
of all people in Canada over 65 have various avitaminosis.		This may be much too low. About 50%
Arthritis	5%	
Diabetes mellitus	2%	
Alcoholism	5%	
Schizophrenia	2%	
All other conditions including cancer	4%	
TOTAL	20%	

ORTHOMOLECULAR PSYCHIATRY, VOLUME 3, NUMBER 4, 1974, Pp. 223-230

too much leucine compared to isoleucine. Leucine increases the loss of vitamin B3 in the urine, while isoleucine prevents this. These are several of the reasons why corn is such a pellagra-producing food, as is millet in India. Populations which live on corn therefore suffer from pellagra unless the vitamin B3 is provided by other foods. This may be done by enrichment of flour as in North America, by use of coffee or bananas which provide small quantities of vitamin B3. But many races of men have used large quantities of corn without suffering from pellagra. These men first treated corn with alkali salts, usually lime. This makes the vitamin B3 more available and increases the amount of isoleucine. Thus one group of men learned to remain healthy by a simple modification of their cooking habits, while another group continued to suffer pellagra until they discovered alternate supplies. It is clear the people treating the corn with alkali were better nutritionists (Katz, Hediger, and Valleroy, 1974).

If we do not heed the lesson to be learned from the pellagra sufferers of a century we are doomed to suffer the pathology and disability of the malnutritious until we too develop a more intelligent nutritional approach. Orthomolecular medicine, of which Orthomolecular psychiatry is a subdivision, represents one of the modern intelligent approaches.

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