Editorial

Schizophrenia Delenda Est

We have to eliminate not only the syndrome called schizophrenia but also the name. I have been working on eliminating the syndrome since 1952 and I believe we are making some progress. I will summarize my argument for this conclusion and for the equally strong belief we can eradicate it very simply by doing to schizophrenia what we did to pellagra. In 1942 the United States Government mandated adding niacinamide to flour. The pellagra pandemic which had been raging for nearly 100 years in the southeast United States and around the Mediterranean Sea disappeared, or at least the most flagrant clinical expression of it did. During the peak of this pandemic, as many as one third of the mentally ill patients admitted to southern mental hospitals were psychotic.

After Joseph Goldberger discovered the cause of pellagra, a deficiency disease, and after Dr. Elvehjem in Wisconsin discovered niacin and niacinamide were the anti-pellagra vitamins, pellagra was vanquished. This brilliant decision of the US government during the Second World War, saved humanity incalculable lives and disability and trillions of dollars in costs. In 1930, 30,000 Americans died from pellagra in the southeast.

Nearly every psychiatrist will think I am out of my mind and I should be taking olanzapine or risperdol. Of course, if I did, I would be out of my mind. I have been taking niacin instead for the past 50 years. But psychiatry has never really considered schizophrenia a biochemical disorder even though it pays lip service to this idea in order to justify the use of antipsychotics based upon the unproven neurotransmitter hypothesis involving either dopamine or serotonin or both. All the other neurotransmitters are conveniently forgotten. I am suggesting that increasing the amount of niacinamide to our flour to the equivalent of 100 milligrams daily would go a long way toward eliminating schizophrenia in the same way a much smaller dose eliminated pellagra. This is my best guess. The optimum range to be added can be easily determined. (Foster and I develop this argument in our book, *How to Live Longer with Niacin,* in press) But this idea is far too radical and will likely be ignored for another two generations. I think it will be easier to change the name from the present monstrous and incorrect term, schizophrenia, which replaced an equally horrid name, dementia praecox, in 1900.

The Importance of Names

In 1951 after Humphry Osmond and I had started to study the psychotomimetic properties of LSD and mescaline, it occurred to us that we could use this experience to reproduce something like the delirium tremens alcohol induces in some alcoholics. Hitting bottom was one of the core beliefs of Alcoholics Anonymous and delirium tremens was one of the reactions considered to be "hitting bottom." But DT is dangerous and at times carried a high mortality risk. We thought controlled LSD sessions would be equivalent and we could give this to alcoholics who might profit from this horrible experience. But to our surprise, after Osmond and his staff had given the drug to a few volunteer alcoholics, they found they could not reliably reproduce delirium tremens. The patients rather enjoyed the experience. This of course has been known by people who used these hallucinogens for centuries; the experiences of which there are many descriptions of. Osmond realized nothing really exists until it has been honored with a name. He therefore coined the word "psychedelic" to describe the phenomenon. He reported this in 1957 in New York at a meeting of the Academy of Science. The rest is history.

The name identified the phenomenon so investigators would understand what

they were trying to observe and study. "Psychedelia" hit the streets and was ruthlessly suppressed and research was stopped. However it did not stop LSD's illegal use and it became very widespread. The government by its violent reaction prevented research and enabled its wide spread street use as it is doing with all drugs today. The study of psychedelia went into a long sleep, which I have characterized as a Rip Van Winkle phenomenon. Rip is waking up. Just this week the *Economist,* a rather sober journal, gave some space to psychedelia. It is being resurrected and at last, after 40 years, a few Universities are being allowed to study psychedelia once more. The name nearly killed psychedelia and now it is being resurrected, to recreate what we described in our book *The Hallucinogens*.

I have been convinced from the start the word "orthomolecular" is superb because it is accurate in describing what we do and it directs treatment to the use of nutrition and nutrients in optimum amounts. It differs from nutritional medicine, which uses nutritional principles to prevent disease. Nutritional treatment is part of the vitamins-as-prevention paradigm and is not a treatment to the medical profession. They are not afraid of it even if they do not understand it. It definitely excludes the use of large doses of vitamins. Integrative medicine totally avoids orthomolecular medicine and has little use for nutritional medicine. It is an attempt to integrate alternatives such as acupuncture, homeopathy, massage, etc, into the field of general medicine. Holistic medicine has become mostly soft "touchy feely" and pays attention to the influence of the mind on our body. All these terms are very accurate for what they do and I respect them, but they are not orthomolecular. Dropping the term and hoping they will adopt some of the principles of orthomolecular medicine is futile. No treatment which avoids using optimum doses of the right vitamins will help the majority of mentally ill patients get well. Orthomolecular is part of the newer vitamin-as-treatment paradigm.

The Art and Science of Diagnosis

The objective in diagnosing is to direct treatment but in order to do so one must find out what part of the body is sick and what kind of sickness is it. If a patient complains of severe pain in the chest, shortness of breath and fever one will immediately think of the lung, perhaps pneumonia. This is the syndrome. But there will be different reasons why the lung is not functioning well. This will include infections, bacteria, fungi, cancer, asbestosis and others causes. No logical treatment can be started until the cause of the syndrome is found. This will involve diagnostic procedures and laboratory tests. If it is tuberculosis it will require treatment different from treatment given to someone with a bacterial infection. When there are no reliable diagnostic tests one must depend on one's clinical judgment. Therefore a syndrome is a constellation of symptoms and signs which directs the clinician's attention to the differential diagnosis and to the diagnostic tests which must be used to determine the reason for the presence of syndrome. For the pneumonia syndrome, the clinician may use any or all of the following tests in addition to the findings of the physical examination; X rays, CT scans, blood and urine tests for infections, serological tests, direct internal examination and more.

There are no diagnostic tests for the schizophrenia and I think it will take a long time to develop them because it is a syndrome and there are many triggers that set it off. There may be a common pathway, which I have suggested is the adrenaline–adrenochrome pathway, but this hypothesis has been carefully avoided by the establishment. Some of the triggers of the syndrome described in a 1900

textbook of psychiatry listed the following four conditions in the differential diagnosis of dementia praecox, the name then in use. These were dementia praecox, syphilis of the brain, pellagra and scurvy. The serological test for syphilis became the diagnostic test for tertiary brain syphilis, pellagra would be suspected by a history of severe malnutrition and a high corn/low protein diet, scurvy could be suspected by the usual scorbutic changes and dementia praecox had no test. As soon as antibiotic treatment became available for syphilis it was removed from the field of psychiatry and became the province of neurologists and internists. When pellagra came under control this too was removed from psychiatry, and when scurvy was eventually recognized as a vitamin deficiency giving fruit cured it. Three of the four diagnostic groups from this ancient differential were identified and removed from psychiatric care. This historical lesson has not ever been properly recognized for its importance. Because it shows as soon as we have a proper diagnostic test which will be followed by the correct treatment it too will taken away from psychiatry. We psychiatrists have always been left with the hopeless untreatable diseases; we became the custodians of the untreatable.

In 1960 our Saskatchewan group made a little progress when we found the majority of schizophrenic patients excreted a mauve staining factor in their urine later identified as kryptopyrrole. More recently it was found this is not quite correct but it is close enough. Carl C. Pfeiffer took this one step further and showed this substance caused a double deficiency of pyridoxine and zinc and called this subset of schizophrenics pyroluria, one of four major groups. A second group had too much histamine in blood (histadelia), and a third group were too low in histamine (histapenia), and the fourth group were the patients who were allergic, primarily to certain foods. This process will surely continue as more and more subtypes of this condition are found, We will then have diagnostic tests for each of the subtypes and it will no longer be permissible to consider that all schizophrenic patients have exactly the same biochemical abnormality.

The Ever-changing Names for What Was Called Insanity

In 1850 the diagnosis was insanity. But this term was too broad and included other psychoses including manic depression, now called bipolar, A few years before 1900 the term dementia praecox was introduced and it was to be distinguished from manic depressive psychosis. I do not understand the reasoning behind this name. Dementia is a well-known word but why add praecox? The originator probably used praecox to indicate the psychosis came prematurely, too early; I suppose we might have called it galloping schizophrenia. But about 1910, Eugene Bleuler described the group of schizophrenias to replace dementia praecox. After the first world war, his German text was translated into English and it became the bible for English psychiatry. To be schizoid is to be split. Bleuler referred to a disharmony between thought and mood. Thus if a patient who should be very depressed having lost his parent or child and instead is too cheerful this would be considered inappropriate. It did not mean, as too many people assumed, there was a split personality. Osmond and I made this point in our book *How To Live With Schizophrenia* published in 1966.

The word is now enshrined in our culture as one of the most misunderstood and fear-inducing terms and has taken on a broad meaning. One uses it to insult or criticize one, especially a politician, if he changes his mind about some issue. And it has developed odour. People are fearful of it, do not understand it. The word is not useful in directing treatment or in indicating where the biochemical defect is.

The Schizophrenic Syndrome

John Conolly defined the syndrome insanity, now called schizophrenia, about 150 years ago as a disease of perception combined with an inability to identify that these perceptual changes were not real. I cannot think of a better and more useful definition. Perceptual change refers to change in the way the central nervous system appreciates the external world and includes hallucinations, voices and visions. Being unable to distinguish these changes that are not real is a measure of thought disorder. Modern psychiatry would like to avoid using this definition but is forced to depend upon both thought disorder and perceptual changes. A patient who is perceptually normal and has no thought disorder will likely never be diagnosed as schizophrenic. Conolly gave some examples. I like this one: A woman had a post-partum psychosis and was in his mental hospital. She was very depressed because she knew her husband was dead. In fact, he was very much alive. But she could see his ghost perched on a tree outside her hospital window; she knew if you were ghostlike you must be dead. The psychiatrist told her husband. Her husband then asked whether he should go into her room and show her he was alive. The doctor thought this would be too much of a shock, however when no one was looking her husband slipped in. His wife saw him, fainted, got up and said, "Lets go home." Her depression was cured. She hallucinated his ghost, and she wrongly concluded that he was dead, but when confronted with the real person she became well. Another example: One of my patients told me in 1954 he was a professional person who had been brought in by the police. He said he was walking westward on the main street of Regina and suddenly the heavens opened and a vast illumination filled the sky. He heard a voice boom at him, "You have syphilis and you can be cured only if you have intercourse with a virgin." He concluded the vision had been created by God and he hastened to obey. Conveniently a young girl was walking in front of him and he began to chase her. He soon found himself in hospital very confused at what had happened. The perpetual visual change and his misinterpretation of the changes made him psychotic, schizophrenic. He was one of the first ten patients treated with niacin in Saskatchewan and made a complete recovery. He went back to his profession and over the years advanced up the ranks.

Forty years ago, people were more naïve about perceptual changes as the street use of the hallucinogenic drugs was not yet widely known. Many patients I have seen who had experienced the LSD reaction in their youth were never as easily frightened by visions and more readily accepted their perceptual changes as not real.

Here are three examples of schizophrenia.

Ken, 21 years old, was dying in a catatonic stupor at one of our mental hospitals in 1953. He had been committed; this was usually a life sentence. He had gotten worse after insulin coma and again after ECT, the two standard treatments of the day. One month after starting on niacin and vitamin C he was normal and remained normal. I interviewed him 15 years later. Bill became schizophrenic in his teens when I started him on treatment in 1973. After I saw him, I referred him to an orthomolecular doctor. Today he is on the professorial staff of a well-known university. Jim was diagnosed as hopeless at age 12 and his parents were advised to lock him up in a mental hospital in 1960. His father, a doctor, fed him sandwiches consisting of bread, jam, niacin, jam and more bread (a niacin-jam sandwich). His psychiatrist very angrily refused to give him niacin, claiming it would "fry his brains" and they had tested it and it had not worked. Jim ate these sandwiches while walking on the grounds of the hospital with his father. He was well in 12 weeks. He be-

came a psychiatrist and published papers on manic depression. These three young men had little in common except they had been diagnosed schizophrenic and had recovered on the correct treatment. Recovery means no symptoms, getting on well with family and with community and paying income tax. Any modern psychiatrist would have found all sorts of diagnostic terms to use from the more than 300 terms available in DSM-IV. All three are cases of pellagra, because if pellagra is a disease due to a niacin deficiency cured by niacin, any disorder cured by niacin fits this definition.

HOD Test

Humphry Osmond and I developed a card sort test to assist in the diagnosis of schizophrenia. We entered into the experiential world of schizophrenia by learning as much as we could from our patients about their perceptual world, by reading autobiographies of recovered patients, and by taking the hallucinogens, including adrenochrome and adrenolutin. With this experience we were able to visualize what some of these changes might be and we constructed a set of questions to be answered, true or false. The numbers on the cards placed in the true box would be a measure of their schizophrenia. A large proportion of the questions (cards) tested their perceptions. We assumed there would be a large number of cards in the true box category. We then tested thousands of patients and ran correlations with other variables. We found schizophrenics scored very high with a mean score of about 65. Normal subjects scored less than 10. Other diagnostic groups scored under 30. We also compared the scores with the results of the urine mauve factor test and found the high scorers, irrespective of their clinical diagnosis, on average had many more mauve factor excretors. We also found other diagnostic groups. For example, depressives who scored high responded well to vitamin treatment as if they were having similar biochemical problems. For a while we played around with the term malvaria for this subgroup of all patients but later dropped it in favor of pyrroluria as suggested by Carl C. Pfeiffer. This subgroup of non-schizophrenia, called malvaria and later pyroluria, had the following characteristics: A) They scored high on the HOD test; B) They responded very well to niacin treatment; C) They shared these properties with schizophrenic patients.

Comparison of schizophrenic and Pellagra psychosis.

	Schizophrenia	Pellagra
Perceptual		
Visual	Yes	Yes
Auditory	Yes	Yes
Others	Yes	Yes
Thought disorder	Yes	Yes
Mood disorder	Yes	Yes
Behavior changes	Yes	Yes
Skin pigmentation	minor	major
Gastrointestinal	minor	major
Deaths increased	Yes	Yes
Reasons	Heart Suicide	Malnutrition
Treatment	Diet	Diet
	Niacin	Niacin
	3000mg & up	100 to 1000mg
Time required	Months to years	Months

The major difference is pellagra is caused by a total malnutrition generated by high corn and low other nutritious food diets, while in schizophrenia, in most cases where starvation is not endemic, the major dependency is for vitamin B_3. The

skin lesions in pellagra are responsive to tryptophan. Schizophrenics exposed to the sun, as were pellagrins, also suffer skin pigment changes. The 1930-1940 pellagrologists were very good observers. How could they then miss this obvious similarity between schizophrenia and pellagra? They did not miss it, but they were so impressed by the vitamins-as-prevention paradigm they were blinded by what they observed. They knew pellagra was a deficiency disease and that only small amounts were needed in most cases to cure and to prevent further relapses. They knew schizophrenia was a major intractable chronic mental disease. They insisted they were different conditions because of their being blinded by the old vitamin paradigm. When niacin became available they gave it to both pellagrins and schizophrenic patients and by their definition, if they responded in a short period of time they were pellagrins even if it took 1,000 mg daily and if at these doses they did not respond they remained schizophrenic. They could not make the differential diagnosis on clinical grounds alone. When these experts in pellagra were so certain they were not the same, investigators thereafter would no longer examine the issue. As I had studied vitamins for my Ph.D. this did occur to me. I looked upon niacin as a drug and not as a vitamin, and only much later did I realize (as did the FDA) what we were dealing with. The vitamin-as-prevention paradigm was enshrined around the following beliefs: 1) vitamins are needed only to prevent the classical well known deficiency diseases; 2) Only very small amounts are needed. It followed one should not give vitamins unless these deficiency diseases are present and large doses are then not needed and are forbidden. Giving large doses of niacin to schizophrenic patients broke every rule of the vitamin-as-prevention paradigm. Had the pellagrologists properly titrated the optimum need for the vitamins on a large scale and not have been blinded by the vitamin-as-prevention paradigm we might have had a treatment for schizophrenia much earlier.

William Kaufman, Niacin Pioneer

William Kaufman, M.D., Ph.D., was the first physician to use doses of niacinamide more than 1,000 mg. daily. He published the results of his research in 1943 and again in a second book in 1949. Several pellagrologists were using up to 1,000 mg. for a variety of conditions but Kaufman was above any one else in his use of megavitamin doses. In doing so, he broke rules of the first vitamin-as-prevention paradigm. His excellent report in 1983 summarized his vast research experience with this B_3 vitamin. I will quote liberally from this very important and seminal but totally neglected paper.

In November 1999, *Nutrition Science* by Dan Lukaczer, N.D. reported: "A few years ago, Wayne Jonas from the NIH Office of Alternative Medicine in Bethesda, MD., conducted a 12-week, double-blind, placebo-controlled study of 72 patients to assess the validity of Kaufman's earlier observations niacin was of great benefit to the elderly, reducing arthritis. Jonas reported niacinamide at 3 g/day reduced overall disease severity by 29%, inflammation by 22% and use of anti-inflammatory medication by 13%." Patients in the placebo group either had no improvement or worsened.

"Although these may be considered only modest changes, Kaufman noted improvement among his patients started after four to 12 weeks–the time at which Jonas' study stopped. He also found people might continue to improve for up to a year before they plateaued. Jonas' recent study identified no significant side effects."

Probably fewer than 1% of all physicians have ever heard about these arthritis studies. Since vitamins, such as niacin, are not patentable, the pharmaceutical

companies see no benefit in promoting substances over which they have no monopoly control.

I confirmed Kaufman's arthritis observations as have many orthomolecular physicians. Patients would tell their doctors that their arthritis had cleared even though they had not expected this positive side effect. But I am interested in his views of the psychiatric disorders induced by a deficiency of vitamin B_3, niacin and niacinamide. He used mostly niacinamide, as he was concerned about the niacin flush. In our work in Saskatchewan we did not consider the flush a major problem as we were used to dealing with drugs that had much more dangerous and unpleasant side effects. Because we were not afraid of niacin, my colleagues and I discovered it lowered cholesterol levels. It was the first and is still the best, the gold standard, because it safely decreases low density cholesterol levels, increases high density levels, lowers triglycerides and lowers Lipo A. The Coronary Drug study proved in a large series of men in mid-life who had already had a coronary event over the next seven years of treatment niacin decreased the death rate by 11 % and increased longevity by two years. No other substance has this excellent track record. E Boyle, involved in this major study, had previously treated a large number of patients with niacin. He reported "In a large series of coronary patients of which we were due to have lost about 62 in the last ten years according to insurance company mortality tables only 6 died of coronary thrombosis as of today."

Kaufman found niacinamide also was beneficial in healing cardiovascular pathological change.

Now I will let Kaufman speak for himself about the widespread malnutrition in the United States

"I quote from the Bulletin of the National Research Council no 109, dated November 1943 entitled *Inadequate Diets and Nutritional Deficiencies in the United States: Their Prevalence and Significance*: All the data from numerous surveys among persons of all ages in many regions are entirely in accord in showing deficiency states are rife throughout the nation. Relatively few are the traditional severe, acute types. Most are milder in intensity and gradual in their course. Predominantly they are sub acute or chronic states; some marked, but very many mild or moderate. From this evidence, it is clear there is both a preventive and a corrective problem."

In 1943, the fortification of thiamin. riboflavin, niacinamide and iron filings was mandated in white flour. The patients Kaufman saw between 1940 and 1943 are described. They could not have benefited from this enrichment program.

"The syndrome then included impairments of nervous system functioning as evidenced by anxiety, depression, personality changes, excessive startle reaction to noise, excessive fear of being hurt, impaired balance sense, paresthesias and other sensory impairments." Kaufman then described physical changes in the skin and of the gastrointestinal system. "The niacinamide-responsive signs and symptoms largely disappeared soon after compulsory enrichment of bread early in 1943 were: anxiety, depression, changes in personality, startle reaction to unexpected sounds, excessive fear of being hurt, erasable paresthesias of the soles of the feet, metabolic edema, gastro intestinal symptoms. Certain patterns of the common form of aniacinamidosis persisted. There included adverse changes in the lingual membranes, impaired muscle strength, impaired joint mobility, impaired balance sense and in persons over 55, a mental syndrome consisting of mild depression or agitation and hyperkinesias."

Kaufman also found the retinal vessel walls, which became less transparent

and more opaque with age did not do so in his patients on niacinamide. The vessel walls became less opaque and more transparent. He was also surprised at the decreased incidence of stroke.

I think that the first clear evidence of the impact of fortification of flour with thiamin, riboflavin and especially niacinamide was published in *New York Times,* July 30, 2006. Kolata described recent findings that the current generations in the United States and in many other countries is much healthier than previous generations going back one hundred and fifty years. The author writes:

"New research from around the world has begun to reveal a picture of humans today that is so different from what it was in the past that scientists say they are startled. Over the past 100 years, says one researcher, Robert W. Fugal of the University of Chicago, humans in the industrialized world have undergone a form of evolution that is unique not only to humankind, but unique among the 7,000 or so generations of humans who have ever inhabited the earth."

That difference is not due to changing gene, as they do not change that rapidly, nor is it entirely a matter of lifestyle. The present generations are taller, heavier, live longer, and are affected by many conditions such as arthritis 10 to 25 years later in life. The IQ, a very poor measure of intelligence, has been going up as well. It is suggested that babes are born healthier and that gives them a better start.

Nutrition is mentioned once as a factor. I suggest that this may be one of the most important factors and that the improvement now evident may be arising from the fortification of the flour that began in 1943. Kaufman witnessed the major change soon after this was done. I think we are now seeing the results of that wise decision of the United Sates government. It also reinforces my view that the addition of B_3 to flour has, to a major degree, already improved the health of our population substantially. The result would have been even more striking had more been added. The needs of that part of the population that required much more would also have been met.

I doubt this view will be very popular in the medical profession, which still lives in the vitamins-as-prevention mode. Kaufman quotes Dr. A. Goth who, in his textbook, *Medical Pharmacology*, wrote, "In most cases, however, vitamins are used by the medical profession and by the laity under the mistaken impression larger amounts than the minimal daily requirement will promote optimal health. This feeling has been further promoted by popular statements concerning the inadequacy of our modern manufactured food with regard to vitamin and mineral content. It is believed by critical authorities most of the widespread use of vitamins by the population is wasteful and the benefits claimed by many persons must be due to a placebo effect." This is a perfect summation of the vitamin-as-prevention paradigm in which Goth was lost in 1974. Are they still teaching this stuff in pharmacology classes?

Here I will give Bill Kaufman the final word: "Just imagine for a moment what things might be like today if patients now "warehoused" in nursing homes and geriatric hospitals had received (starting two, three or four decades earlier) the benefit of adequate niacinamide therapy either alone or in combination with other vitamins. They would now have improved strength, improved maximum muscle working capacity, improved balance sense and freedom from certain mental syndromes."

Had he written this today he might have added mental hospitals and prisons to his list and freedom from schizophrenia. In his present memoir, (p.1), *Niacinamide: A Therapeutic Agent,* Dr. Kaufman reports he was surprised at the number

of patients he saw at the beginning of his practice. He discovered his colleagues in the same area had conspired to send him their worst, sickest patients whom they had not been able to help. It is obvious he was treating a mentally sick population and today most of them would have been called anxiety states, depression or bipolar and personality disorders. These were the patients normal medical care could not help because they were deficient in vitamin B_3. Even earlier Tom Spies had described the mental symptoms of pellagra, and Glen Green studied a large number of mentally disturbed children who he found were typical cases of subclinical pellagra.

Deficiency and Dependency

For many biological variables, if one charts the number of individuals having a property against frequency, the curve on the chart follows a so-called normal distribution form. For example if one measures the height of men, this will range between a low figure to a high figure but the majority of men will be somewhere in the middle. More men will be 5'10" than 5' and fewer will be 6'10" than 5'10." Almost all biological variables have this variation. The curve is a bell-shaped curve and most of the values will lie within two standard deviations from the mean. The same distribution applies to our need for nutrients. Roger Williams made it very clear in his writing about biochemical individuality we are not alike and we do differ in this way. We have different needs for calories for example and of course for the nutrients, which are so essential. But the optimum needs for vitamins have not been determined. I do not know of any study where the optimum needs for vitamin C have been determined. The vitamin-as-prevention paradigm has been the major obstruction to this research. It forced everyone to accept that vitamins were needed only in very small amounts. It forced an examination of only those individuals who needed lower amounts than the average since it excluded the needs of those who need much more. The vitamin-as-treatment paradigm broke this rule and forced serious examination of the population who needed much more regardless of the reasons. It is known that disease, stress and many other factors determine how much is needed and this is not a static figure.

Let us assume the most reasonable hypothesis that if one measured the optimum needs of a large population, it would follow the same bell-shaped curve. The individuals in this population would not be well unless they had what was their own optimum need. The current RDAs are based upon very little good research done so many years and enforced by legal action, which had not taken into account this important principle. Once the mean optimum value had been determined one would expect that people consuming values on the low side would not be as healthy as people taking in the mean value. The further from the mean these individuals were, the sicker they would be. If they were two standard deviations away they would develop pellagra, the niacin deficiency disease. The closer they were to the mean optimum intake, the healthier they would be. But if one depended only upon the natural amount of the vitamin in food it would be easier to meet and much less attention would have to be paid to the quality of the diet. The optimum dose is that which meets the physiological needs of person without side effect. With vitamins, taking more than the optimum is not harmful unless enormous doses are taken. This is in striking contrast with drugs which when taken too much is more harmful than taking too little. Taking too little is more harmful than taking too much, again within reason. Any substance, no matter how safe will have side-effects if the amount is much too

great. Thus if vitamin C is taken in large doses it will cause diarrhea in some. This is not necessarily toxic but if the diarrhea is excessive it might be. Therefore this is used as an upper end point. It is called the sub-laxative level and was discovered by Robert Cathcart. Ideally we should talk about the relative deficiency. If a person needs 1,000 mg. of vitamin C daily and eats only 100 mg. his intake will be 10% of his optimum need. If he or she needs only 100 mg. and gets 30 mg. they are getting only 30% of their optimum need. Taking more than the optimum is of little value but as it is not dangerous it is better to err on the side of a little too much. The only waste will be in the cost of the vitamin and fortunately, as they are not patented, their costs have not jetted into the stratosphere.

Patients whose needs are in the upper range will never get enough and they will have to use supplements. These are the vitamin dependent group. The range of need varies from the left end of the bell-shaped curve to the group who need a lot more at the right end of the need distribution. With Foster, I have shown half or more of our population need vitamin B_3 supplementation.

Vitamin B_3 deficient and dependent patients will share many symptoms but they will not be identical since the reason for the relative deficiency is different. The vitamin deficient are also lacking many other nutrients because their diet is so poor, but the dependents may be dependent on only one vitamin and may be getting enough of the others from the diet.

Causes of the Dependency

The causes of B_3 dependency have not been studied because the concept has never been examined. No doubt there are many reasons. These may be genetic and present from birth due to the absence of genes or the presence of defective enzymes that are involved. I have concluded that in the majority of cases the enzymes start to work after birth and may develop at an early age but they may come on toward the end of life. There are two major factors. One is that a long-term deficiency will become a dependency if the condition is not treated. The pellagrologists in the 1930s observed that when dealing with well recognized cases of pellagra there were a few who did not become well until the amount of B_3 was increased to 1,000 mg. daily. They could not understand the reason for his. It was also shown that the canine equivalent of pellagra, called black tongue, showed the same variable responses. If dogs were maintained on a diet deficient in B_3 for a few months and then given back the vitamin they would quickly recover on the usual small doses. But if the dogs were deficient for more than six months thereafter they needed much larger doses. Being kept deficient eventfully made these animals dependent. I think the same thing is happening on a much wider scale today. People who appear to be well for many years on a diet only mildly deficient will eventually become dependent. This accounts for the fact that so many of the modern diseases of our affluent society develop in middle age and later, although there is evidence that these conditions are beginning to attack much earlier than they used to. For example, if patients with early onset arthritis with very little joint degradation but with pain and stiffness are given B_3 they recover very quickly. My mother, who at age 66 was developing typical arthritis with Heberdens node, was well after only one month on niacin, one gram three times daily after meals. She lived another 20 years and wrote two books during that time. If the condition is allowed to damage the person for a long time it will take much more vitamin and a much longer period of time.

The second major cause is stress of any type and includes malnutrition,

chronic disease, and brutality. I will discuss only the type of stress that was forced on Canadian soldiers in the last war when they were incarcerated in Japanese Pow camps for 44 months. They suffered from a combination of all three forms of stress. The adverse impacts of combined stress and malnutrition peaked in the concentration camps of Europe and the prisoner of war camps in the Far East.

"The effects of this stress-malnutrition combination did not end upon release. It's subsequent impacts were obvious on the aging process. Over 2,000 untrained Canadian soldiers were sent to Hong Kong to defend it from invasion from the east. But the Japanese attacked from the west and soon all these Canadian soldiers were in prison camps. Forty-four months later, one quarter of them had died and the rest were left permanently impaired. On their way home in hospital ships, they were fed the strongest vitamin preparation then available, rice bran extracts and apparently they rapidly began to regain their health. Those that had survived had lost up to one third of their body weight began to replace some of this loss. Although they appeared to become well again, they did not. A survey conducted by the federal government, established that they were much sicker than Canadian soldiers who had fought in Europe and, as a result, they were given special pensions. After the war, they suffered to an exaggerated degree from all the diseases of aging, including arthritis, blindness, heart disease, neurological deterioration and depression. Dr. Hoffer estimated that one year in Far Eastern prisoner of war camp aged these soldiers about five years, as compared to a normal year living at home. A soldier imprisoned in such a camp at chronological age 35 would come out 4 years later with a biological age of 55.

One of these former Hong Kong veterans was the administrator of a retirement home for many elderly men and women. He had been depressed, experienced severe arthritis, was fearful, was heat and cold intolerant and had spent some time on a psychiatric ward for veterans. He had been diagnosed as having a personality disorder. Much to his surprise after two weeks on niacin he became normal. All these symptoms disappeared and he remained well until he died years later as Lieutenant Governor for the Province of Saskatchewan. Through his intercession, some 20 more Hong Kong veterans, as they were called, and USA former prisoners of war came to see Dr. Hoffer. Given niacin treatment, they all recovered. It was concluded that the high dose niacin had reversed the health deterioration caused by the extraordinarily severe stress of these camps."

The Deficiency-Dependency Continuum from Pellagra to Schizophrenia

The deficiency produces a large variety of psychiatric syndromes. Green and Kaufman independently of each other described this so well. It appears that a good deal of modern psychiatry depends on its bread and butter from patients suffering from pellagra which has not been identified. They would do a much better job if the basic treatment were to restore the vitamin which is lacking. At the other end of the continuum the syndrome is much more likely to be much more severe and chronic and includes the psychoses of aging, bipolars and the schizophrenias. Therefore it is logical to drop the word schizophrenia and to use the correct term, which is pellagra, which would be described as light to severe or as brief to prolonged. The pellagra caused by a deficient diet could be called deficiency pellagra and the pellagra caused by increased need would be called dependency pellagra.

Clinically schizophrenia and the pellagra psychosis could not be distinguished

from each other in the southern mental hospitals where they had the most experience in dealing with these syndromes. The differential was made on the basis of what they ate and the typical skin colour and the when niacin became available it was used. Schizophrenic patients who recovered with small doses of niacin were re-diagnosed as pellagra and schizophrenic patients who did not recover were allowed to remain schizophrenic. Schizophrenia did not have the same degree of skin discoloration because they were not exposed to the sun as much as the pellagrins. The major clinical difference that was accepted by the pellagrologists was that only pellagrins would respond to better diets and small amounts of niacin. They did try up to 1,000 mg. daily and they were surprised a few pellagrins did need these higher doses, in those days an enormous dose. Since these syndromes are almost identical and since the differences can be readily accounted for by the fact they represent extreme ends of the need continuum why do we not use the correct name.

If it quacks like a duck, walks like a duck, looks like a duck and flies like a duck then surely it must be a duck. Pellagra is that duck

Advantages in Using the Correct Term

1) The stigma of the word schizophrenia will not be carried over to the term pellagra.
2) The term schizophrenia does not indicate either a cause nor the correct treatment. The term pellagra does.
3) Pellagra would be accepted as a nutritional disorder which it is and schizophrenia never will be.
4) The term pellagra will force society to better care for these patients since it will have to take more responsibility for the present poor quality of our national food supply which is rich in calories but deficient in many nutrients,
5) Patients will find the word much more acceptable.
6) Prevention will become more acceptable by improving the quality of the food supply and by adding the nutrients which are needed so many more people will get enough. For the remainder, supplements will be used with more dignity and less attack from the establishment.
7) The total cost of treatment will be decreased substantially as treatment will be started earlier, There is nothing more economical than getting patients well.
8) Scientists will be more interested in developing laboratory tests to determine what the needs of each individual are.
9) Examination of trigger factors such as food allergies will be easier to study.
10) It will be easier to diagnose the other nutrient forms of pellagra such as pyridoxine dependent, selenium deficiency and syndromes due to excess copper, deficiency in essential fatty acids and probably many more.

Why pellagra is so wide spread. By my definition every person who gets well on niacin is without question suffering from a niacin deficiency or dependency.

In 1968 Linus Pauling described Orthomolecular Psychiatry. Becoming informed about our use of very high doses of niacin and vitamin C with no harm to our patients, Pauling wondered why many needed these doses. He was familiar with Irwin Stone's work with vitamin C and his concept that we all suffer from hypoascorbemia because we have lost the biochemical ability to convert glucose into ascorbic acid.

In the early 70s it occurred to me a similar sort of genetic change was occurring in mankind which started a long time ago. Niacin (I include niacinamide as well) is in itself not the anti-pellagra vitamin. It must first be converted into nicotinamide adenine dinucleotide (NAD), which in turn will be changed to NADH from which NAD can be regenerated. It is a reversible

cycle. There is another source from which NAD can be made: from tryptophan, the amino acid. About 1.6% of the ingested tryptophan is converted into NAD. If the natural diet contained enough niacin why would the body still need to make more from the tryptophan? Perhaps there is a similar genetic change occurring now and we are losing our ability to convert tryptophan to NAD and are therefore becoming increasingly dependent on the niacin in our food and less on the tryptophan in our food. The body could still remain well and would use the energy saved by not having to make NAD for other reactions. The body would have more tryptophan for conversion to serotonin for example. The high corn, pellagra-inducing diet is such an example. Corn is deficient in tryptophan, the niacinamide is so tightly bound it can not be utilized by the body, it is deficient in isoleucine and in essential fatty acids. Natives of Central America discovered thousands of years ago that corn would not make them sick if it was treated with lime overnight and then cooked. This released the tightly bound vitamin. But natives in Southern United States were not familiar with this discovery.

Was there a time in our past when our diet became deficient in niacin? There was. Our major source of the B vitamins was the whole grain cereals and meat and fish, This diet provided small amino of B vitamins but they were barely adequate. However, around 1800, there was a change from whole grain and long extraction flour to the pure white flour, which was prized by the nobility and later by the whole population. Whole grain cereals remained the diet of the poor who could not afford to buy the white bread. The millers had made very fine silk screens and were able to remove much more efficiently the wheat germ and bran, with most of the vitamins from the flour. This shift gradually encompassed the entire population; now we no longer are able to get enough of the vitamins. It is interesting that around 1800 the first clear clinical description of insanity was recorded. Putting it together, I hypothesized that the rise in pellagra (schizophrenia) was due to the evolutionary change-over from depending on both niacin and tryptophan for our NAD to depending more on niacin present in our food, combined with the marked decrease in niacin in our food after 1800. This genetic process is undoubtedly still going on. Horrobin estimates the schizophrenic gene or genes are slowly spreading into our population.

The Advantages of Having Pellagra (Schizophrenia) But Not Being Sick

For a thorough analysis of the disadvantages and advantages of having the schizophrenic genes you must read the excellent book *"The Madness of Adam and Eve"* by David Horrobin

Creativity

Horrobin describes and lists a large number of very famous people who had schizophrenia in their families. Out of the 5000 patients I have treated I am amazed at the number who are very intelligent and very gifted and creative In philosophy, technology, arts and science. They have been well known poets, including Allen Ginsburg whose mother was schizophrenic. His poem *Kaddish* is based on her illness. There have been brilliant mathematicians with schizophrenia; John Nash received the Noble Prize, as told in the recent movie *A Beautiful Mind.*

I inform my schizophrenic patients that I wish I had some of their genes, as they are so good for them if they are fed properly. I do this as I want to remove the feeling of shame and guilt so many have, thinking they have bad genes and there is nothing anyone can do about it. I think the notion of "bad genes" must be eradicated. I then tell them that people fortunate enough to have these genes will,

if they are well, have the following attributes. Physically they will age gracefully, will be less subject to arthritis and will be much less subject to cancer. The psychological advantages are illustrated by describing some of the patients I treated who became well known artists, poets, and writers, compassionate doctors (17 of them) lawyers, nurses, entrepreneurs.

Resistance to Pain and Shock

Donovan and Osmond surveyed the opinion of 15 experienced clinicians about the impact of shock. Almost all of them had observed that these patients did not respond to pain and shock as did normal people. Adding their own observations Donovan and Osmond wrote "We have seen schizophrenic patients with acute peritonitis, renal colic, pleurisy, and even coronary thrombosis, who neither complained of much pain nor exhibited vasodepressor reactions. They summarized their findings as follows: "We have remarked on the combination of tolerance to histamine, reduced incidence or allergy and allied ailments, and an apparent resistance to wound and surgical shock, One of my chronic female patients, having been treated in a chronic back ward hospital in Baltimore was physically sick from inexcusable neglect. Her mouth was full of a small number abscessed and carious teeth. She was examined by a dentist who advised immediate extraction. This was done in two stages. In the meantime she was on niacin therapy. After half her teeth had been removed, the next morning I found her eating her breakfast as if nothing had happened. A few weeks later the rest of her decayed and infected teeth were removed. The following day at breakfast she complained bitterly about the pain. She had regained her ability to feel pain. On a comprehensive orthomolecular program she was so much improved she flew back to her home in Baltimore on her own. At the air port where I saw her off we ran into a friend. We chatted for a few minutes. He did not have the slightest idea she was a chronic back ward patient. Had he seen her when she arrived he would have known immediately. Unfortunately after she got home her family could not find a doctor who would work with her and she eventually relapsed, but not to the same degree, and had to go back to the same hospital, but this time not to the chronic back ward from which she had come. Perhaps the hospital had been shamed.

Donovan and Osmond wrote" Is it a mistake to assume schizophrenia must always be disadvantageous? Indifference to pain, resistance to wound shock, the perforation of major viscera and similar catastrophes, a reduced incidence of allergies and arthritis, however obtained, would give substantial biological advantage particularly in primitive societies."

In 1964, Huxley J, Mayr E, Osmond H and Hoffer A discussed schizophrenia as a genetic morphism. We made the point that if a genetic change survives it must have conferred on the body an advantage which would give it an evolutionary edge, I have suggested this edge is the diversion of more tryptophan into other compounds rather than into NAD when there is enough niacin in the food, These advantages are very significant and very important. There is no advantage in being sick. These advantages are present in relatives of schizophrenics who have the gene but for many reasons are not sick or in schizophrenics who have been feeding them properly by giving them all the B_3 they need.

Pellagrins (Schizophrenic Patients) and Cancer

Hoffer 2004. Pellagrins (schizophrenic patients) do not get cancer as often and when they do, they respond much better to orthomolecular and standard treatment. Out of 5,000 schizophrenic

patients I have seen since 1952 only 10 had cancer and they all recovered while on vitamins and then given the usual standard treatment for cancer. Foster and Hoffer concluded their paper as follows, "The reproductive rate of schizophrenics has typically been so low that unless related genetic aberrations conferred some counterbalancing advantage(s) this disorder would rapidly have become very rare. Evidence has been presented shows schizophrenics and their close relations suffer less cancer incidence than the general population. This suggests the genetic trait(s) responsible for a greater tendency to become schizophrenic may simultaneously impart a resistance to cancer. Is there a balanced morphism in schizophrenia? The authors suggest this genetic trait(s) involves the greater than normal production of the hallucinogen adrenochrome and its derivatives and these catecholamine o-quinones promote both schizophrenia and a resistance to cancer. Elevated adrenochrome then is a double-edged sword. On the one hand it appears to protect against cancer, while on the other it promotes psychosis. This suggests the treatment of schizophrenia requires the prescription of natural methyl acceptors such as niacin (vitamin B_3) and ubiquinones (coenzyme Q10) to reduce adrenochrome production. Antagonists of adrenochrome such as serotonin and triiodothyronine also may be beneficial. While conversely, the successful treatment of many cancers may ultimately require the prescription of substances that cause abnormally high adrenochrome that levels and temporary psychosis."

Disadvantages of Being Sick

I do not recommend any one voluntarily enter the schizophrenia state. It must be avoided as much as possible. I see no net advantage in being sick. This disease can be completely destructive of the individual who suffers and of the family who nearly always have to suffer with him or her. This occurs in most patients who do not receive any treatment and to patients whose treatment is entirely the standard anti-psychotic drugs. The vast majority of these patients I saw were referred to me by physicians. The sickest ones were those who had already been under treatment from up to 12 different psychiatrists with everyone using the same drugs, one after another, or one combination after another. They were all failures from drug-only treatment. I think I have seen almost every type of very sick patients from the early onset to those who have been sick the last 25 years of their lives. And it is not necessary. There is one major disadvantage. Schizophrenic patients more often have difficulty with their heart. I expect this results from the conversion of adrenalin to adrenochrome in the mycardial tissue. Adrenochrome in excess poisons heart muscle and may cause ventricular fibrillation and death. Cocaine increases the formation of adrenochrome and I suspect the few sudden deaths in athletes undergoing severe exertion may be due to this factor. Niacin is one of the best antidotes to adrenochrome and on theoretical grounds coenzyme Q10 and glutathione Q10 should also be helpful. Thus patients on niacin are protected against this schizophrenic defect.

The Future: Prevention, Early Treatment

The future follows from the past and present. The deficiency pellagras have been vanquished in countries that enrich white flour. This pattern has already been established. We can and must do the same for the dependencies pellagras (schizophrenia). We must determine how much niacinamide to add to our food to provide enough to meet the needs of the majority of the population. For the rest vitamin supplements will be recom-

mended. Laboratory tests will develop which will help to determine what each individual needs are. My guess is 100 mg. per day would not be noticeable in the flour and would be a good starting dose. It would cost very little to take a whole community and get their agreement to allow all their flour and flour products to be enriched. At least half the population will benefit and we should see an enormous decrease in the prevalence of all the diseases which may only be an expression of the one major disease called pellagra. Early treatment would become much more prevalent as the public would be much more aware of the nature of this condition and would be prepared to act quickly. All stigma and shame attached to schizophrenia would vanish.

Here I will again give Bill Kaufman the final word: "Just imagine for a moment what things might be like today if patients now "warehoused" in nursing homes and geriatric hospitals had received (starting two, three or four decades earlier) the benefit of adequate niacinamide therapy either alone or in combination with other vitamins. They would now have improved strength, improved maximum muscle working capacity, improved balance sense and freedom from certain mental syndromes."

Conclusion

Schizophrenia and pellagra are clinically the same and often one cannot be distinguished from the other unless the niacin therapeutic test is given. They are both nutritional diseases with major social, economic implications, they both respond to proper treatment with optimum doses of niacin. Pellagra is a B_3 deficiency condition. Pellagra is also a dependency disease because there is not enough niacin in even the best of diets and this must be supplemented. The word "schizophrenia" is therefore redundant. Even more, it is damaging to patients, to their families and to society. The correct term is pellagra and this can be qualified by the term "dependency pellagra" to distinguish it from deficiency pellagra.

I hope Cato the Elder will not mind but, *Schizophrenia delenda est!*

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