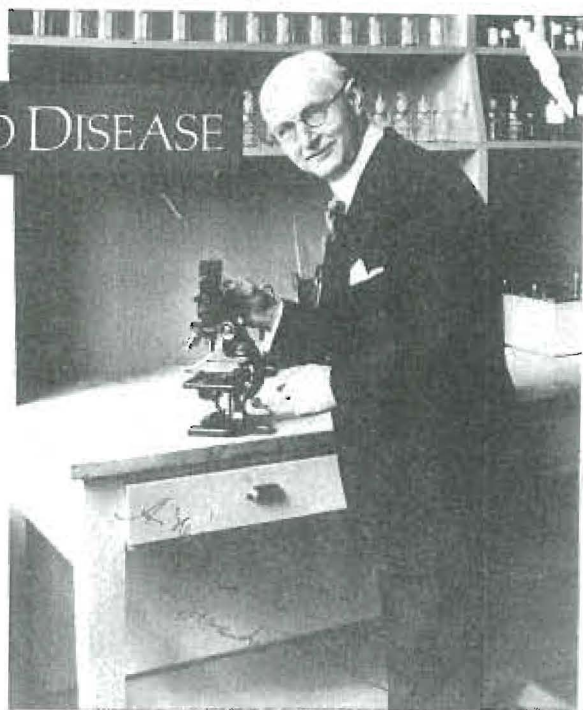


THE PIONEER WHO LINKED DIET AND DISEASE



WESTON PRICE, D.D.

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eston Andrew Price's beginnings were inauspicious—born in 1870, raised on a farm in Ontario, dental degree from the University of Michigan in 1893. Yet by the end of his unusual career—a career that took him on 150,000 miles of field visits all over the globe in an attempt to satisfy a single burning question—Weston Price had helped lay the foundation for a new emerging discipline: the study of the interrelationships among diet, disease, and Western civilization.



New Zealand Maori hold samples of seaweeds, a vital native food then being replaced by commercial fare.

He lived at a time when every other dentist was moving through his patient roster on automatic pilot, facing one mouthful of decay after another. Price chose not to echo the popular question, "Why are modern teeth so bad?" Instead, he took note of the low incidence of dental problems in remote, non-Westernized cultures and then reversed the premise entirely: "Why are 'primitive' teeth so healthy?" Price's simple query was a flash of brilliance, so fresh, so disarmingly simple, and at the same time utterly penetrating. One admiring colleague, Harvard anthropologist Ernest Hooten, called Price's subsequent work "one of those epochal pieces of research which makes every other investigator desirous of kicking himself because he never thought of doing the same thing."

Mrs. Price with a descendant of the ancient Chimu culture of Peru.



B Y K I R K J O H N S O N

The thrust of nutrition was different then. With the discovery of vitamins and their usefulness in preventing disorders like beri-beri (thiamine) and scurvy (vitamin C), health professionals focused their attention on so-called deficiency diseases. Dentists and physicians were urging people to eat foods from all four major food groups (meat, grain, dairy, vegetable and fruit) to ensure that everyone got enough precious nutrients. Today, in the affluent West, diseases of deficiency are a minor health problem compared to such diseases of excess as hypertension, colon cancer, obesity, and heart disease. Increasingly, fatty, low-fiber processed foods are being linked to these diseases. Forty years before his time, Weston Price was preaching the virtues of much the same diet that science now knows is best for the body: whole grains, fresh fruits and vegetables, less refined sugar and flour. What could have convinced this man to depart so radically from a health profession whose love affair with the traditional Western diet only recently has come under widespread scrutiny?

Modern dentistry was young when Weston Price graduated from dental school. Researchers were just discovering sugar's role in promoting tooth decay. Price's early papers dealt with issues such as how the new phenomenon of X-rays might find applications in dentistry and why every dentist should use electricity. His real career began when Price the practitioner became Price the patient. His new practice in Grand Forks was cut short in its first winter when, stricken with typhoid fever, Price left his office to recuperate in the Canadian wilderness. For some time he had suspected that something vital to the body's processing of food—perhaps a nutrient or group of

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nutrients—might be missing from the diets of those in poor health. Now he was convinced that certain fats contained essential fat-soluble vitamins and other "mineral activators" that enabled the body to assimilate minerals and other nutrients. Price nursed himself back to health with a diet of milk, wild berries, and fish.

During his recovery Price noticed that his teeth, which had degenerated alarmingly during the course of the near-fatal disease, had stopped decaying. It was by looking in the mirror that he first began to consider diet as a prime determinant of dental health.

Everywhere it was the same story. As modern foods crowded out the traditional, dental disease soared.

The observation dove-tailed with something he had noticed in his patients: that the condition of their teeth was often tied to their overall health.

Price's own success with his dietary regimen encouraged him to quicken his research. In 1916, he opened a laboratory in Cleveland, Ohio, his new home. The practice flourished, but his patients' persistent dental disease continued to trouble Price. As he looked around him, he realized that any inquiry into the root of modern society's dental problems could not begin in the United States. Here at home tooth decay was affecting nearly 100 percent of the population. He would have to take his search beyond the borders of Western civilization.

So in 1931 Price and his wife set off on their first expedition—destination: the Alpine valleys of Switzerland.

They were searching for two kinds of communities—villages whose isolation led them to rely solely on locally produced foods, and communities whose contact with Western society had introduced some modern foods into local diets.

High in the Alps, in picturesque glacier country not far from the Matterhorn, Price found two perfect candidates. They were the rural villages of Ayer and Vissoie. In Ayer, a typical meal might consist of a slice of whole rye bread and a large piece of cheese, washed down with cow's or goat's milk. Meat, usually mutton, was available once a week, usually on Sunday, with bones and scraps eaten later in soups. The summer brought a few green vegetables. The incidence of dental caries in Ayer was quite low; only 2.3 out of every hundred children's teeth examined showed evidence of decay.

It was a different picture indeed in neighboring Vissoie, where for several years a government-built road had brought white flour; jams, marmalades, highly-sweetened fruits, jellies, sugar, and syrups; and bakery equipment for white-flour products. Here the rate of tooth decay was eight times higher, at 20.2 per hundred.

And so it went from town to town, Grachen to Visp to Loetschental to Visperterminen. Everywhere, Price examined teeth, recorded diets, and sent samples of food home to his Cleveland, Ohio laboratory for analysis. Everywhere it was the same story. Isolated people who had never seen a toothbrush had the typical deposits of unscrubbed mouths but very little tooth decay. As modern foods crowded out the traditional, dental disease soared. A number of people Price interviewed told of being cavity-free throughout their lives except for a one- or two-year stay outside of their mountain villages, when they had invariably lost some teeth.

It was much the same story in the British Isles, the next stopping point. Here the Prices found island



Price said of the isolated population living in Switzerland's Loetschental Valley that "they have neither physician nor dentist because they have so little need for them."



In these photos from Nutrition and Physical Degeneration, Price noted that the typical rugged Gaelic children above, who lived on oats and sea food, had strong, wide faces and nostrils. Below, modernized Gaelic children with narrow faces and nostrils.

communities so isolated by dangerous seas that one twenty-year-old woman had never seen milk in any amount larger than drops. Oat products, sea-food, and a few vegetables were giving children a low caries rate of 1.3 percent. But in a seaport town, on the fringe of Westernization, angel food cake, white bread, canned vegetables, and sweetened fruit juices filled store windows and counters. Price watched people crowd the dock each day to greet the arrival of the evening boat. Of one hundred young adults, twenty-five were already wearing artificial teeth and, wrote Price, "as

many more would have been more presentable had they too been so equipped."

The influence of diet seemed to prevail even within the same family. On the opposite coast of the island, two teenage brothers were eating at the same table. The one with excellent teeth subsisted on a traditional diet. His caries-ridden sibling insisted on having white bread, jam, highly sweetened coffee, and chocolates.

Over the next few years Price and his wife used their vacation time to study both isolated and modernized Eskimos, Gaelics, Polynesians,

Peruvians, and others, including some thirty African tribes. When the last bit of data had been collected and dissected, Price wrote that the traditional diets associated with "almost complete immunity from tooth decay" were unusually high in protein, vitamins, minerals, and "fat soluble factors," with no empty calories. The foods of commerce—refined flours, polished rice, canned vegetables, and sugar products—were inevitably nutritionally inferior.

Tooth decay wasn't the only byproduct of modernization. Price saw anatomical deformities in Westernized children that were virtually unknown among their less acculturated cousins. Underdeveloped jaw bones were causing mouths full of crowded, irregularly spaced teeth. Constricted nasal passages forced many youngsters to be mouth breathers. Children on Western foods were growing taller, but the bones of the hips were narrower, leading to later complications in pregnancy for the girls. Physical defects ranging from hairlip to clubfoot were not uncommon.

Price attributed these problems to a phenomenon he called "intercepted heredity"—poor nutrition could meddle with the normal transfer of genetic messages from parents to child. While often neglected by more Westernized ones, caring for the nutritional needs of the next generation was ingrained in isolated populations. In the Fiji islands, for example, when a woman became pregnant, the chief would call a feast in celebration of the new member who would soon be joining the colony. He would use the occasion to appoint one or two young men with the task of gathering lobsters and other nutrient-dense seafoods to ensure the healthy development of the fetal infant. Among Eskimos this nutritional reinforcement took the form of dried fish eggs, and in Africa natives gravitated toward fresh-water plants, particularly iodine-rich water hyacinths.

A young Melanesian male with perfect teeth: nary a toothbrush to be found but still very little tooth decay.



Price's hypothesis must have seemed dizzying, even to him. Could heredity, the very lifeblood of human continuity, actually be so malleable as to be upset by white flour and canned vegetables? Price saw no other way. The longer mothers subsisted on Western foods, the more pronounced were their children's anatomical deformities. On the average, each successive child born to a Westernized mother had more severe problems. Moreover, when natives returned to their natural diets, Price watched the pattern reverse. Mothers once again gave birth to children with strong teeth, "splendidly formed" dental arches, and healthy overall bone structure.

Price ended his travels in 1935 and returned home to write. Three years later presses rolled with the first copies of his 526-page magnum opus, *Nutrition and Physical Degeneration*. Written for a lay audience, the book was part science, part travelogue, with a heavy dose of dogma. Each chapter held a piece of the chronology, detailing his observations within one country or region. He used his skill as an amateur photographer to illustrate the text with portraits of his open-mouthed subjects.

Price had a clinician's eye for the human tragedy that so often accompanied Westernization. Dentists were sparse or nonexistent in the more remote areas, and with no one to treat decaying teeth, misery was often acute. In some areas, toothache was the only cause of suicide.

At times the book gives us glimpses of the utter completeness of Weston Price's world view. Nutrition stood at the center of Price's universe, dispassionately rewarding cultures that lived in concert with nature's laws and punishing those who strayed from them. Thus far, Price had drawn connections between diet and tooth decay, and between diet and overall physical degeneration. It must

not have been difficult to make the next great leap: if indeed food were so inextricably tied to the physical well-being of body systems from head to toe, couldn't diet be a factor in the development of the mind?

And so in his treatise Price stepped easily from the physical ailments of modern man to an inquiry on the origins of mental retardation. Mental retardation was a structural disorder, he argued. In one chapter Price presents the case of one of his patients, a sixteen-year-old Mongoloid boy who spent his days playing on the floor with his blocks like an infant. Price was able to stimulate the boy's pituitary gland by surgically widening the roof of his mouth. In four months' time, he passed through several years' worth of physical and emotional development, growing a mustache, enjoying adolescent pranks, shooting up three inches in height, developing a crush on Price's secretary. A rod-like appliance kept the boy's jaw bones in position after the operation. When it would occasionally become dislodged the bones would settle back together and within one or two days the boy would revert to his former infantile behavior.

His point, however harshly presented, was simple. Modern society should take a lesson from primitive society. Non-modernized cultures respected womanhood with careful family planning and took seriously a nutritional commitment to the developing fetus. Their immediate reward might be a sound child, but in the long run, such care helped create a society with physical and spiritual integrity. Price believed that people owe Western civilization two things: the production of strong, solidly built bodies and the disease-free maintenance of those bodies. This meant teeth without caries, tonsils without abscesses, hearts without murmurs, minds without retardation, and "boys and girls with adequate control of the animal instincts."

Comments from the reviewers were mixed. This "rather remarkable



In addition to the balanced facial development of this Andes Mountains resident, Price noted his large lung capacity.

study" was flawed by some statements that seemed dubious, said the *American Journal of Public Health*, citing four or five unsubstantiated nutrition claims. Chlorophyll isn't really the precursor of vitamin A, the *Journal* said. Nor can diabetes be prevented and cured by a plant found in British Columbia. "One gathers the impression that the author has accepted some stories as facts without proper verification." The *Journal's* doubts did not extend to Price's central thesis, however. Against the minor factual errors, there was not much doubt that Weston Price had made a "most important contribution" to the determination of the cause of dental caries.

Price's detractors were evidently outnumbered by loyal admirers both within the profession and among the public at large. As his followers lectured on the book to the other dentists and physicians, new converts would approach the stage, requesting copies of the slide program so that they, too, could spread the message to their colleagues. A generation of health practitioners would receive its first glimpse into the interlocking nature of diet and disease through the pen of Weston Andrew Price. Despite its imposing bulk, *Nutrition and Physical*



Price said inadequate nutrition of the parents was responsible for the difference between the face and dental arch of the modernized Samoan youth, left, and a traditional Samoan, right.

Degeneration went through a respectable four printings in its first eight years. At Harvard, the book was required reading for anthropology classes.

With the publication of his book, Price began to treat his heavily-cavitated patients with a diet that approximated that of a traditional society. In studies that echoed his own wilderness experience of a decade before, Price began prescribing a diet high in minerals and low in sugar and refined flour. Small amounts of high-vitamin cod liver oil and butter were emphasized as a source of fat-soluble vitamins. He was a stickler for freshness. Bread not only had to be whole grain, but made from freshly ground wheat. Fruit was to be raw, tree- or vine-ripened, and freshly picked. Price claimed a caries reversal rate of 90 percent.

By the time of his retirement in 1943, after a career that spanned fifty years, Weston Price was a well known, widely respected practitioner. Price's colleagues had given his scientific papers — he had written over two hundred of them — what he modestly termed a “gracious” reception. His curriculum vitae was thick with honors and awards.

They seem to have been good years, though they were not easy. The Prices lost their only son, Donald, who at the age of sixteen died after a four-year battle with heart disease. Donald's death had been the principal motivation for Florence Price's involvement in her husband's work. Florence herself died in 1942.

Price married once more, to Monica Scott Salter. Monica had known the dentist from the hours she had spent in his lab with Florence, her best friend. The death of Monica's seventy-year-old daughter in 1983, from emphysema, left no known living relatives of Weston Price, who himself died of a heart attack in 1948.

The Quichua Indians, though they live at elevations up to 18,000 feet in the Andes, had great physical endurance, Price remarked. Even in frosty weather they went about bare below the knees.



Price wasn't the first person to notice that modernization had hurt teeth; others had returned from their travels with the same curious observation. His special contribution was three-fold. He turned isolated anecdotes into a believable, reasonable, exhaustively documented phenomenon. He expanded dentists' vision, encouraging them to consider the wholeness of the body and the importance of generational continuity rather than confining their practice to the teeth and gums. And with the public, he helped popularize the wisdom of viewing Westernization with a certain suspicion, of structuring one's lifestyle more in concert with the earth's own rhythms.

Most of us leave no footprints on history, the *Journal of Applied Nutrition* wrote in tribute to Price, and our initials last longer carved in the bark of a tree than our memory lives in people's minds. Price's initials have endured well, at least within professional circles. His forty-five-year-old book is still cited in scholarly papers by dentists and physical anthropologists. Dr. Carlton Fredericks, the nutrition author and public health educator, says that of the thousands of books that significantly shaped his thinking in nutrition, Price's stands alone. “Only by studying this classic text and photographs will you realize the full impact that our food technology has on us.” James Presley, author of *Human Lifestyling: Keeping Whole in the Twentieth Century*, concurs. Each week brings new evidence of the vital importance of nutrition, Presley writes. “But no research has yet surpassed Dr. Weston A. Price's monumental international study of nutrition's role in health.” Price's refusal to allow room for the possibility that non-dietary factors might be contributing to the ills of Westernization cannot be overlooked. And yet much of his thinking has been

borne out by later research. For example, one 1981 text (*Western Diseases: Their Emergence and Prevention*, Harvard University Press), a synthesis of the work of three dozen scientists on all five continents, took inventory of twenty-five modern diseases in developing countries. The project confirmed that such diseases do indeed follow Westernization, regressing when diets change (to foods high in starch and fiber, low in salt and fat) and exercise increases. If modern science has not substantiated all of Price's theories, it has clearly captured the spirit: that the rewards of a simpler lifestyle extend beyond purely spiritual healing.

Price's is hardly a household name today. Outside of a tight cadre of believers, a group that includes clinical nutritionists, physical anthropologists, and supporters of the Price-Pottenger Nutrition Foundation (see box), Weston Price is scarcely known. But Price probably wouldn't mind. The strength of his ideology endures. In the end, for this man who spent most of his adult life relentlessly courting a single vision, history's steady validation of his world view would doubtless bring satisfaction enough. □

Resources

The Price-Pottenger Nutrition Foundation uses books, films, slides, and videotapes to educate the public, physicians, and dentists on proper nutrition.

The Foundation offers quarterly publications on its continuing research. Weston Price's text, Nutrition and Physical Degeneration, is available in hardcover through the foundation for \$23 including postage and handling.

For information regarding membership and publications, write to PPNF, P.O. Box 2614, La Mesa, California 92041; or call (619) 582-4168.