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A Brief History of Soils and Human Health Studies

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The idea that there are links between soils and human health is an ancient one. The Bible depicts Moses as understanding that fertile soil was essential to the well-being of his people in approximately 1400 B.C. as they entered Canaan, and in 400 B.C. Hippocrates provided a list of things that should be considered in a proper medical evaluation, including the ground. Moving into the 18th and 19th Centuries, some North American farmers have been documented as recognizing a link between soils and human vitality. However, the recognition of links between soils and human health by these early people was based on casual observations leading to logical conclusions rather than scientific investigation.

In the 1900s the idea that soils influence human health gained considerable traction. At least three chapters in the 1938 USDA Yearbook of Agriculture included recognition of the importance of soil as the origin of many of the mineral elements necessary for human health and in the 1957 USDA Yearbook of Agriculture scientists realized that soils were not only important in the supply of essential nutrients, but that they could also supply toxic levels of elements to the human diet. The U.S. Department of Agriculture established the Plant, Soil and Nutrition Research Unit (PSNRU) on the Cornell University campus in 1940 with a mission to conduct research at the interface of human nutrition and agriculture to improve the nutritional quality and health-promoting properties of food crops.

A major human health breakthrough in 1940 was the isolation of antibiotic compounds from soil organisms by the research group at Rutgers University lead by Selman Waksman. Soil microorganisms create antibiotic compounds in an effort to gain a competitive advantage in the soil ecosystem. Humans have been able to isolate those compounds and use them advantageously in the fight against bacterial infections. Waksman was awarded the Nobel Prize in Physiology or Medicine in 1952, the only soil scientist to date to be awarded a Nobel Prize.

In the 1940s and 50s William Albrecht of the University of Missouri became interested in links between soils and human health, an interest that lead to the publication of several papers. Albrecht's works focused on links between soil fertility and dental health, with a particular focus on the relationships between soil fertility and dental cavities. However, Albrecht did extend the relationships between soil fertility and human health out to broader, more general health issues in some of his writings as well. Well-known figures such as Sir Albert Howard and J.I. Rodale also published works in the 1940s that included soils and human health components. Then André Voisin published "Soil, Grass, and Cancer" in 1959. Much of Voisin's work focused on nutrient content in soils, including both nutrient deficiencies and imbalances, and how that influences nutrient status in plants and animals that are in turn consumed by humans. Several health problems are discussed, including but not limited to birth defects, goiter, mental illness, diabetes, and cancer. Voisin concluded that the medical profession had largely ignored soils in their efforts to improve human health, but that soil science should be the foundation of preventative medicine.

Soils and human health studies continued in the later part of the 20th Century. The health effects of exposures to radioactive elements in soils received considerable attention after the 1986 Chernobyl incident, however, even prior to Chernobyl radionuclides in the soil and how they may affect human health were receiving attention. Investigations into the effects of heavy metals in soils became a common theme as did organic chemicals in soils and the effects of trace elements on human health. Following up on the discovery of antibiotics, soil organisms received increased attention as they related to human health.

By the end of the 1900s, M.A. Oliver (1997) noted that "... there is a dearth of quantitative information on the relations between elements in the soil and human health;...there is much speculation and anecdotal evidence." The idea that soils influence human health is not new, it has existed for thousands of years and gained considerable attention in the 20th Century. However, the scientific study of soils and human health is a recent undertaking.

Reference

Oliver, M.A. 1997. Soil and human health: a review. European Journal of Soil Science 48:573-592.