

Erwin Frink Smith, 1854–1927

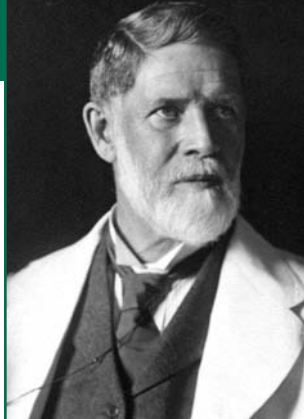
Erwin F. Smith believed his greatest contribution to plant pathology was to stimulate others through working in his laboratory and through his writings. He also contributed by determining the causal relationship of numerous microorganisms to specific diseases; being instrumental in establishing the field of bacterial phytopathology; and gaining the worldwide respectability of American research in plant pathology by defense of the position that bacteria cause diseases in plants. He also made the medical community aware of plant diseases with his hypotheses of and investigations on the similarities of human cancer and plant cancer (crown gall).

Smith began employment in 1886 with the U.S. Department of Agriculture and remained with the Department for 40 years. His first assignment was to investigate the causes of the peach

yellow disease. His experiments were well-designed and based on information he found in European scientific articles. He had learned the

French and German languages, which helped him review literature as an employee of the Michigan Board of Health in his early years. This literature search

acquainted him with the work of Pasteur and Koch, among others. Smith continued to review and translate European literature, which was



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distributed to American scientists through publications.

Smith established the infectious nature of peach yellows but could not find a causal agent. Since it had been determined by Burrill, Arthur, and Waite that a bacterium causes the fire blight disease of apple and pear, Smith believed that he should become proficient in bacteriology to solve the peach yellows disease. Throughout his career, Smith added to and refined bacteriological techniques through his characterizations of bacteria that cause plant diseases. This did not help him solve the cause of peach yellows, however.

Smith was adamant in following the postulates of Koch to establish the causes of plant diseases. The causal relationship was determined with many diseases in which only the association of bacteria with disease had been previously established. He was so positive about his work that when Alfred Fischer criticized it, he wrote a rebuttal that was published in a leading journal. As a result, the scientific community, both in Europe and in the United States, recognized that bacteria cause diseases of plants as well as animals.

Smith was instrumental in establishing laboratories for the Department of Agriculture in many locations in the United States and became knowledgeable about many plant diseases. He established that the common soil fungus, *Fusarium*, caused a wilt disease of many plants and that there were many forms of the fungus that caused wilt in specific plants. He collaborated with W. A. Orton to develop a strategy for control of *Fusarium* wilt of cotton by selecting resistant plants. He was a leading proponent of controlling plant diseases by the development of resistant plants.

Although Smith was not a teacher per se, he delivered many lectures at universities and at the Woods Hole Marine Biological Laboratory. He wrote a three-volume monograph entitled *Bacteria in Relation to Plant Diseases* and a textbook entitled *An Introduction to Bacterial Diseases of Plants*. He was a strong proponent of women working in science and hired many to work in his laboratory.

Prepared by Robert Stall