Harvey Washington Wiley had long hoped for passage of legislation that would give him police power to enforce a national food purity standard. As the government's chief chemist, he watched ruefully as late nineteenth-century efforts to pass an effective food law met organized resistance in Congress. The nation's major food processors demanded to see the government's scientific evidence justifying a proposed ban on the use of preservatives. Industry was backed by recognized academics like food chemist Ira Remsen, of Johns Hopkins University. Where, they asked, was the hazard in prolonging the shelf life of canned foods with tiny amounts of sodium benzoate and other additives? Secretary of Agriculture James Wilson, always responsive to the political currents, turned to Wiley for the missing data.

In 1902, as Wiley was returning from a summer break in Europe, an idea came to him for testing chemical adulterants in common use at the time. His plan called for applying the new scientific methods used by the natural sciences as well as by social scientists of that day: prospective studies of human subjects according to a pre-defined plan. These protocols were the forerunners of today's clinical surveys or clinical trials. Wiley's unusual twist called for recruiting a select group of federal employees willing to place themselves at risk by intentionally consuming the putative toxins. These volunteers would be immortalized in the annals of government servitude when a Washington Post reporter referred to them as the "Poison Squad."

Problems with Methodology But Not with Media Attention

"I want young, robust fellows," the doctor announced. Their job, in Wiley's own words, would be to "substantiate the deleterious effects of food preservatives." Noteworthy was his use of the word "substantiate" instead of "determine." Even before he began, his experiments were handicapped by a pre-ordained conclusion. (When the time came for his volunteers to reveal the anticipated signs of injury, Wiley was also prepared to deduce that children and the elderly would suffer even greater effects, clinching his argument that preservatives should be outlawed...all of them.)

All subjects served as their own control, each one consuming a "healthy diet" for two weeks, then continuing for another two weeks eating the same foods but with preservatives added, and then resuming the unaltered diet for a final two-week interval while the presumed ill effects were recorded. If necessary, the concentration of adulterant would be increased and the three phases of study repeated.

Serious problems with Wiley's experimental design were immediately apparent to any informed observer. First, neither the volunteers nor those conducting the experiments were blinded; everyone involved knew when the "good food" or the "bad food" was being served. Second, the study intervals were too short: the protocol lacked the necessary transition periods for establishing or reversing the expected metabolic effects. Third, in the absence of objective testing or direct...
observation of individual bodily organs, observers were limited to recording subjective complaints rendered by individuals who were well aware of the reaction expected of them. Of course, only a handful of scientists were capable of recognizing these methodological deficiencies.

Once again, Dr. Wiley was out of step with the emerging science standards of his day; yet he remained a proven master at capturing the attention and respect of both the press and the general public. His advertisements for volunteers attracted reporters to his office in droves. All were told how the experiments would be conducted and what the results would show. When Secretary Wilson learned of his chemist's emerging public relations campaign, he promptly called it to a halt. Let the findings speak for themselves, he told Wiley. Wilson was already doubtful that the experiments would yield results that convinced academic and corporate experts. He was eventually proven correct.

**Obfuscation and Outrage**

The Poison Squad remained in service for nearly five years. In that time, Wiley withheld publication of any findings, his lame excuse being that he had been muzzled by the Secretary of Agriculture. Actually, Wilson became as demanding of the results as a persistent press corps. Wiley's collated data, a hodgepodge of subjective commentary, was entirely lacking in precision. For instance: "It appears...that both boric acid and borax, when continuously administered in small doses for a long period of time...will create disturbances of appetite, digestion, and health." No further definition of "small doses" or "long periods" was forthcoming. Subsequent announcements were equally non-specific: "the addition of salicylic acid to foods is reprehensible in every respect and leads to injury of the consumer," or "the addition of formaldehyde to foods tends to derange metabolism." No mention of dose or concentration was offered.

There might have been genuine truth to some of his conclusions, but the absence of quantitative definitions cast a lasting doubt on the entire effort. As with all careless science, the tragedy lay not only with what was discovered falsely but also with what was missed altogether.

The science community's outrage following Wiley's shameful performance stimulated no further elaboration of results. Summaries were eventually printed in Department of Agriculture publications, but none of the experimental data was ever submitted to a learned journal for peer review. Nonetheless, Wiley's effectiveness with the print media meant that he was still admired by the public and also by enough Congressmen to feel assured of his continued government service. Secretary Wilson was politically astute, and he realized that any effort to remove Wiley from his post as government chemist would have political consequences.

With Congress growing increasingly progressive in the early years of the twentieth century, Wiley would soon conclude it was time for him to act on behalf of the American public to secure passage of the long-awaited pure food law.

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