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## Chemicals in Food

THE subject of chemicals in foods has become one of considerable interest during the last 4 or 5 years because a large number of important scientific developments have resulted in the application of chemical substances to our natural foods. In evaluating the use of chemicals in foods, it is necessary to maintain a proper perspective. Chemicals are added to foods for many reasons. During growth, insecticides and fungicides are used to reduce pest damage and to increase production. The residue of some insecticides remains on the food and must be removed to within tolerance limits. Finding an insecticide that leaves no residue harmful to human beings, yet still kills insects, is only one of the problems involved.

During processing and packaging, chemicals may be added to our foods to increase nutritive values, to preserve color and flavor, to prevent oxidative changes during the period between packaging and consumption, to improve processing and packaging techniques, and to promote edibility, ease of use, and, in general, consumer acceptance.

For all these reasons, we are at present dependent upon the products of chemical technology in food production, and modern production cannot be maintained without the cooperation of the chemical industry, the food industry, and the government. New developments come forward rapidly—so rapidly that their evaluation strains the facilities for checking these products as they appear. The food industry has initiated a large number of studies to cover the pharmacologic and toxicologic problems involved—purity and adequacy of foods, the nutritive value of chemicals used in food processing, the depletion of spray deposits on crops before harvesting, and many others. One major difficulty in conducting these studies is that we are limited to animal experiments in finding proof of the lack of hazard in the use of a particular chemical. Even after the pharmacologist

has completed his tests on animals, he is not always certain that the chemical substance will be entirely safe for man. Many scientists have advocated human experimentation, although of course under carefully controlled conditions.

Another aspect of the subject of chemicals in food is the legal one as set up by the Federal Food, Drug, and Cosmetic Act, administered by the Food and Drug Administration. Under the present act, poisonous and deleterious substances must not be used in foods shipped in interstate commerce. Changes have been proposed in this act and it is hoped that a definition of what is poisonous and deleterious will be forthcoming.

The entire matter of handling pharmaceutical studies, technologic problems, and public health problems is extremely complex, as is shown by the papers presented at the symposium on chemicals in foods at the Boston meeting of the AAAS. The food technologist, the medical man, the nutritionist, legal and scientific control agencies, the pharmacologist, the biochemist, the dietitian, the biologist and the consumer all are involved. These papers consider nutrition, purity, food law, spray deposits, medical testing, food industries, the food supply, and the consumer. One of them, "Purity and adequacy of foods" by R. R. Williams, appears in the present issue of *Science*. Others in the series will be published in *The Scientific Monthly*.

These papers should serve as a guide and source of information to all those interested in our foods, both consumers and producers. Progress in the food industry is dependent upon the wise use of the discoveries of the agriculturist, the food technologist, the chemist, the biologist, and the engineer. We cannot turn backward. We must go forward with the help of increasing knowledge, guided by the best minds and the best information that science has made available.

C. N. FREY

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