In addition to clinical illness, other effects of pesticides must be recognized. Walker and his associates (22) found DDT in every complete meal they analyzed in this country, but the concentration in the entire diet is so low that the average intake is only 0.184 mg. per man per day. Because DDT is so widely distributed in food, we at the Communicable Disease Center have made numerous studies of this compound and found it occurs also in the fat of almost everyone in the country (7, 11, 15, 19). In the general population, the average storage of DDT is about 5 ppm, and the concentration of all DDT-derived material expressed as DDT is about 12 ppm (11). Meat abstainers (11) and Eskimos (7) store less than the general population. On the contrary, agricultural applicators store about three times as much as the general population (11), and formulators may store more than 600 ppm of DDT and more than 1,000 ppm of DDT-derived material (10). Published results (10) show that men can eat DDT daily at a level approximately 200 times greater than that in the ordinary diet without showing any detectable clinical effect, but of course, they store large amounts of the compound and its derivative, DDE, in their fat tissue. Ortelee (18) found that more than half of the people working for years in DDT-formulating plants excrete, and therefore absorb, DDT at a rate equal to or greater than that of man eating 200 times more DDT than people get from ordinary food. The formulators remained well according to their own evaluation, their work record, and medical examination.

It is a general principle of pharmacology that a steady state of storage is reached in connection with continued, tolerated intake of a drug or other chemical. Thus, after a period of adjustment, the daily excretion of the chemical becomes as great as the daily absorption. Surveys which were carried out in 1954-56 (11) and again in 1961-62 (20) showed that no change had occurred in DDT storage among people in the United States since 1950, when Laug and his co-workers (14) measured it for the first time. It is not known whether the storage of other compounds is at equilibrium, but a group of British scientists (13) and our own group (12) both have found that traces of dieldrin are stored in people without occupational exposure. My associates and I (12) found traces of lindane also. It seems likely that the storage of other stable compounds will be demonstrated as analytical chemical methods are improved.

Production of Pesticides

Because of their value in public health and agriculture, the production of pesticides has increased greatly. The present manufacture of synthetic ones in the United States is about twice as great as the production of all pesticides was in 1949. The development of newer materials has decreased but not eliminated use of older poisons, such as the arsenicals. Use of some of the newer materials, such as DDT, has continued to increase, while the production of other new materials, such as benzene hexachloride, reached a maximum and then decreased somewhat. The new poisons not only are numerous, but all of them of any importance are sold under many trade names. Over 57 thousand formulations are registered in the United States. Furthermore, poisons may be applied in a variety of ways, some of which were unknown only a few years ago. For example, over 6,000,000 acres of cropland in the State of California alone have pesticides applied to them by aircraft each year. I have discussed these and related facts in greater detail in a report published comparatively recently (8).

Injury from Pesticides in Other Countries

In spite of the extensive production of pesticides, they have a relatively good safety record in the United States, Canada, and the United Kingdom. The record was not so good in some countries of Europe when parathion was