PEANUTS are very sensitive to environmental changes during the curing process which reputedly takes place after the fruits are dug from the ground. For example, curing at temperatures of 35° to 50° C. or higher—which includes 42° C., the temperature reported to produce the maximum respiration rate (15)—sometimes produces serious off-flavors, particularly in the less mature seeds (1, 3, 16). Serious skin slippage and splitting as well as lack of flavor can result from too-rapid drying (1, 2, 16), and chilling is claimed to produce hard seeds (18).

As a consequence of problems of this nature, the curing of peanuts is risky and expensive, and the search for more certain and simpler methods of curing is being pursued.

As a primary step in the search for improved methods, it appeared necessary to increase the extent and precision of our knowledge of the normal curing process. Since no reports were found in the literature which described the respiratory behavior of the peanut fruit during curing, the present study was undertaken to provide this information. Preliminary reports of this work were published earlier (12, 13).

\section*{EXPERIMENTAL PROCEDURES}

Fruits from Dixie Spanish and Virginia Bunch 67 peanut varieties (7) were used in these studies. Before the respiratory measurements were begun, the fruits were washed and their surfaces were sterilized with 1% sodium hypochlorite solution as described earlier (15).

In 1958, the ages of the fruits were based on the time after the pegs (aerial fruits) were tagged and buried. In 1959 the ages were estimated by comparison with a developmental series reported elsewhere (14).

In 1958, individual fruits were placed in 125-ml. Warburg respirometer flasks on perforated trays over solid potassium hydroxide, normally at 30° C. The gas pressure changes were then compared with changes in flasks containing peanuts killed by steaming for one-half hour. Calculations based on standard manometric techniques then gave a measure of the oxygen absorption rates by the curing fruits.

In a few samples, “curing” was carried out in these instances, 5 ml. of a 1% potassium hydroxide solution replaced the desiccant. In these samples, a control inhibitor seemed warranted; so the previously used inhibitor seemed warranted; so the previously used inhibitor was then placed in a flask containing a saturated potassium hydroxide in the side arm, and the other flask containing 20% sodium chloride solution was made against steam-killed peanut fruits in which the combined measurements then permitted the determination of the oxygen absorption and carbon dioxide evolution.

Carbon dioxide evolved by similar fruits in Ascarite and the evolution rates were determined gravimetrically. In 1958, seven fruits were used for these measurements but the weight of carbon dioxide obtained was not very great. In 1959, seven fruits were used for these measurements and a general outline of the evolution rates could be obtained. In 1959, seven fruits were used for these measurements and a general outline of the evolution rates could be obtained. In 1960, 50 to 100 fruits were used at high temperatures, and the weight of carbon dioxide obtained was so small that only preliminary reports of this work were published earlier (12, 13).

\section*{RESULTS}

Respiration during curing at 30° C. or higher and measurements during curing of Virginia Bunch 67 peanuts in 1958 showed that the oxygen absorption rates were steady for approximately six hours and then declined (Figure 1). A comparison with this paper shows that the period of this steady state was somewhat, but six hours appeared to be the average time at 30° C.

Similar results were obtained with Dixie Spanish fruits but their respiration rates were low and not very great. The carbon dioxide evolved by these fruits appeared to follow a similar declining trend in gravimetric measurements used elsewhere. Thus it appeared that peanut fruits during the climacteric which is a characteristic of the ripening of fleshy fruits (17). Further evidence that the climacteric is provided by recent work of these authors reported a gradual decrease in the weight of carbon dioxide evolved.