symptoms of cortical depression and subcortical release such as sweating, one of the earliest signs, and the Babinski. When hypoglycemia is prolonged further, the other parts of the central nervous system are progressively affected. The significance of the differential depression of the various parts of the central nervous system awaits further analysis. Nevertheless, the present results reveal the primary importance of the reduced metabolism of the brain in the alleviation of schizophrenia.

HAROLD E. HIMWICH
KARL M. BOWMAN
JOSEPH WORTIS
JOSEPH F. FAZEKAS

CHEMICAL CHANGES OF FRUITS RIPENED IN THE PRESENCE OF ETHYLENE

THE physiological reactions of fruits ripened in the presence of ethylene have been interpreted in various ways. In some cases it has been considered that ethylene has a definite chemical effect, since more sugar, less starch and increased rate of respiration were observed in the treated fruit. In other cases, the experience has been that the effects of ethylene, if any, were more of a physical nature, since the only results observed after treatment were possibly an increased rate of softening and more rapid color development.

In experiments with pears and certain other fruits, the writer has found that ethylene definitely affects certain phases of the metabolism as well as the chemical composition of the fruit. These effects, however, have been obtained only during a definite stage in the life of the fruit. Thus, pears picked and treated with ethylene while still containing starch in the tissues had more reducing and total sugars and less starch than the untreated fruit. Pears treated at later stages of maturity or after being held in cold storage for short periods of time until the starch had disappeared, showed no increase in sugars as a result of ethylene treatment.

After starch hydrolysis has been completed in the fruit, it has been found that there is still a period of short duration when the softening of the fruit can be markedly accelerated by ethylene. That this increased rate of softening in the presence of ethylene is due to an acceleration of the pectic changes occurring in the cell walls is indicated. Before being ripened, pear fruits normally contain approximately 0.8 to 0.9 per cent. insoluble protopectin, but less than 0.1 per cent. of soluble pectin. During ripening the protopectin in the cell walls is hydrolyzed with a corresponding amount of soluble pectin appearing in the juice. These changes are accompanied by a definite softening of the tissues of the fruit. It has been found that these pectic reactions occur much more rapidly in the presence of ethylene than when this gas is withheld from the atmosphere surrounding the fruit. Thus, pears will contain 60 to 85 per cent. of the total pectin in the soluble form at the end of four to six days of treatment, while only a very small amount of soluble pectin has developed in the untreated fruit during this period.

Further evidence that ethylene accelerates the rate of protopectin hydrolysis has been obtained with fruits other than the pear. Gooseberries, for example, contained 54 per cent. of the total pectin in the soluble form at the end of four days' ethylene treatment, while the untreated fruit contained less than 0.1 per cent. of this amount. Green peaches exposed for a three-day period to an atmosphere containing ethylene developed five times more soluble pectin than the untreated lot.

A very marked pectic change resulting from ethylene treatment was observed in the rind of the Ponderosa lemon. Before treatment the rind of samples of this fruit, picked in a green condition, contained approximately 3 per cent. protopectin, but less than 0.1 per cent. soluble pectin. At the end of a fourteen-day period, the soluble pectin in the rind of the treated fruit had increased over 40 per cent., while the insoluble protopectin had decreased a corresponding amount. In the untreated fruit, however, there was only a slight increase in pectin and no noticeable decrease in protopectin.

The results of these experiments indicate that certain ripening changes, such as softening of the tissues, formerly referred to as "physical" in nature, are really a result of chemical changes which can be influenced by ethylene treatment.

ELMER HANSEN

OREGON STATE COLLEGE
CORVALLIS

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW TYPE OF GNOMONIC RULER

A MODIFICATION of existing gnomonic rulers has been devised in this laboratory in an effort to shorten the time necessary to obtain gnomonic projections from Laue patterns. The method developed is suitable for such projection purposes and is capable of being applied to numerous similar problems. The design and operation of the ruler can be most clearly observed by examining the schematic diagram given in Fig. 1. The ruler consists of a plate so mounted on the Laue pattern that the entire ruler can be rotated about the center of the pattern, a straight edge always passing through the center. On this plate at a fixed distance from the center point of the pattern