The only positive difference shown by the preparations from these four seeds is the greater quantity of N yielded as ammonia by the globulin from the filbert (*Corylus*). This difference exceeds the limits of experimental error by too great an amount to be overlooked and may be taken as evidence that the globulin of *Corylus* differs in structure from that of *Juglans*. A positive difference between the corylin and the globulin from *J. regia* and *J. nigra* is also shown by the precipitation limits with ammonium sulphate. This difference, however, is not very great and, in view of our ignorance of the extent to which these limits may be altered by slight differences in the conditions of experimentation, cannot be considered as conclusive evidence, though it strongly indicates a difference between the globulins.

The precipitation limits of the globulin from *J. cinerea* are higher than those found for *J. regia* and *J. nigra,* but in view of the very close agreement between these preparations in all other respects we are inclined to attribute this difference to the greater purity of the preparations from the latter seeds.

In consequence of these facts, it seems desirable to give a name to the globulin of Juglans, retaining the designation corylin for the globulin of *corylus*. We propose therefore to call the principal protein which we have obtained from the nuts of the three species of the former genus Juglansin.

The botanical relations which are shown by the proteins of seeds deserve further careful study, as it is not improbable that the natural relations of some plants may be thus discovered.

[FROM THE LABORATORY OF THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION.]

THE TRYPTOPHANE REACTION OF VARIOUS PROTEINS.

BY THOMAS B. OSBORNE AND ISAAC F. HARRIS.

Received June 27, 1903.

AS LONG ago as 1831, Tiedemann and Gmelin recognized among the decomposition products of protein bodies a substance whose solution was colored a deep violet-red with chlorine or bromine. The nature of this substance remained wholly unknown until Hopkins and Cole recently succeeded in isolating it in a state of purity and recognizing it as most probably indol-amino-propionic acid or the isomeric skatol-amino-acetic acid. They also found that this substance yielded the violet reaction with acetic and sulphuric acid, which has long been known as Adamkiewic's reaction. This latter reaction they further found was caused by glyoxylic acid contained in the acetic acid, and they have therefore substituted glyoxylic acid for acetic acid in applying this test. This observation is of much importance, as formerly the Adamkiewic reaction was attributed to furfural and the presence of carbohydrates was therefore inferred among the protein decomposition products.

In the following table we give the results of the application of the Hopkins-Cole reagent to a number of different proteins, 50 mg. of each being mixed with 6 cc. of the glyoxylic acid solution and 6 cc. of concentrated sulphuric acid added.

Zein, maize ; very pale straw color ; no reaction.
Alcohol-soluble protein, oat kernel ; light brownish ; no violet tint.
Bynin, malt ; red-brown ; no violet tint whatever.
Vicilin, pea ; very pale violet ; hardly any reaction.
Phaseolin, kidney bean ; pale violet ; a little stronger than vicilin.
Avenalin, oat kernel ; light violet color.
Globulin, wheat ; light violet color.

Hordein, barley ; Legumin, vetch ; Legumin, lentil ; Legumin, horse bean ; Vignin, cow pea ; Conglutin, yellow lupine ; Conglutin, blue lupine ; Amandin, almond ; Glycinin, soy bean ; Gliadin, wheat ; Ovovitellin, hen's egg ; Globulin, sunflower ; Glutenin, wheat ; Globulin, castor bean ; Edestin, hemp ; Excelsin, Brazil nut ; Corylin, filbert ; Conalbumin, egg white ; Ovalbumin, egg white ; Globulin, flaxseed ; Globulin, squash-seed ; Globulin, black walnut ; Globulin, English walnut ; Leucosin, wheat ;	The intensity of the reaction increased gradually from hordein to leucosin, the former giving a positive reaction, the latter a strong one.

Whether any of the above proteins wholly lack the tryptophane group could not be determined, as we were able to get a very slight reaction with a relatively large quantity of zein by cautiously adding the sulphuric acid up to one-half the volume of the glyoxylic acid. The color thus produced was, at the most, very slight and transitory. With the alcohol-soluble proteins of the oat and barley malt, the brown color was sufficient to obscure a slight violet reaction, and the result of the test in these cases was not conclusive.

It is interesting to note the very marked difference in the intensity of the reaction with the proteins at the two ends of the table and it is fair to presume that the proportion of tryptophane yielded by the several proteins differs considerably.

[CONTRIBUTIONS FROM THE BUREAU OF CHEMISTRY, DEPARTMENT OF AGRICULTURE, NO. 49.]

DISAPPEARANCE OF REDUCING SUGAR IN SUGAR-CANE.

BY H. W. WILEY.

Received June 11, 1903.

THE occurrence of reducing sugar in sugar canes and sorghums has important relations to the metabolism of the plants. Presumably the carbohydrate which is finally formed in the chlorophyl cells of these plants is some variety of starch, probably a soluble variety, since starch granules, as such, would find obstructions to circulation in the return currents from the leaves to the body of the plant. During the early stages of growth it has been shown by repeated analyses that the proportion of reducing sugar to sucrose in the juices of the sugar cane is very high. In Louisiana, where the canes are harvested necessarily before growth is complete, the average quantity of reducing sugars in the juice is 1 per cent. or more. In the tropics at the time of harvest the percentage of reducing sugars is very much less, usually less than 0.5 per cent. These facts show beyond doubt that the highest relative value of reducing sugar to sucrose is in the earlier stages of growth and the lowest proportion in the matured stages. Theoretically, then, we might expect that at a certain period representing the complete and perfect maturity of the plant the reducing sugar would disappear. The further