that this fluorescence is also maximally activated at 295 mμ. This shift of fluorescence from the ultraviolet to the visible, with increasing acidity, is completely reversible and is not accompanied by a noticeable change in the absorption spectrum. No corresponding shift in fluorescence is observed with tryptamine, which is activated at 275 mμ and fluoresces at 360 mμ. In fact, tryptamine and tryptophan fluorescence disappear in 3*N* HCl. Obviously, this shift in fluorescence of 5-HT in strong acid must be related to the phenolic group.

Although the significance of this phenomenon is not understood, it can be useful as a method for assaying 5-HT. The visible fluorescence is almost as intense as that at 330 mμ and offers as an additional advantage the possibility of using available fluorescence measuring devices. Where instruments are available for measuring both peaks of fluorescence, the ability to shift the fluorescence from 330 mμ to 550 mμ and back offers additional specificity, since other indoles such as tryptophan do not do this. The factor of specificity is of great importance in measurements on tissue extracts.

A specific method for the determination of 5-HT in brain, based on measurement of 550 mμ fluorescence, has already been developed (*6*).

SIDNEY UDENFRIEND
DONALD F. BOGDANSKI
HERBERT WEISSBACH
Laboratory of Chemical Pharmacology, National Heart Institute, National Institutes of Health, Bethesda, Maryland

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Two Carbohydrases Occurring in Insect-Produced Honeydew

By fractionally precipitating a concentrated aqueous solution of honeydew with ethanol, we have obtained fractions free of sugars that possess definite carbohydrase activities. We have obtained these enzymes from honeydews of the cottony-cushion scale, *Icerya purchasi* Mask. and the soft scale, *Coccus hesperidum* L. These honeydews are different types; the former have melezitose [α-D-G_p-(1→2)β-D-Fru_f-(3←1)-α-D-G_p] and the latter have gluco-sucrose [α-D-G_p-(1→4)-α-D-G_p-(1→2)β-D-Fru_f] as their principal trisaccharides.

Of various carbohydrates containing α- and β-glucosidic, β-fructosidic, and α-galactosidic linkages, only free sucrose would serve as a substrate. In both cases, the enzymes react with sucrose to produce a trisaccharide and monosaccharides. Cottony-cushion enzyme produces melezitose, glucose, and fructose; soft-scale enzyme produces gluco-sucrose, glucose, and fructose. In both cases, the appearance of free glucose must require isomerase activity, for more than half of the monosaccharides produced is glucose. Whether this is a function of a separate enzyme or not is not apparent at this time; suffice it to say that there is no reaction discernible when glucose and fructose are used as a substrate. Both enzymes have little or no hydrolytic activity on either of the trisaccharides they produce even though they both appear to act as α-glucosylases that require hydrolytic action as the initiating step for their synthesis reactions.

The evidence at hand indicates that these enzymes are produced by the insects rather than that they are present in the sap of the host plant. Transcarbohydrases have been reported by Giri *et al.* [*Science* **121**, 898 (1955)] from rat liver but this is, to our knowledge, the first instance of this type of enzyme from insects.

JOHN P. WOLF, III
W. H. EWART
Citrus Experiment Station, University of California, Riverside

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Graphic Determination of Mean Values

In a recent communication, G. W. Hervey (*1*) commented on a graphic method for determining the mean value of three ordinates presented in a paper on moving averages (*2*). Earlier references have been found (*3*); an essentially equivalent procedure, the location of the centroid of a triangle, dates back to the writings of Archimedes (*4*).

However, the extension of this type of technique to apply to any number of points was described only recently (*5*), and further investigation (*6*) of the properties of centroids has led to other graphic methods. The center of gravity of the points charted on a scatter diagram represents simultaneously the mean values of both the x and y variables. If the number of points can be factored into powers of 2 and 3 only, the graphic location of the centroid is straightforward and rapid. For example, with 24 ($2 \times 2 \times 2 \times 3$) points, joining neighboring points in pairs and marking the midpoints of the 12 segments so obtained will lead to 12 points, each representing two of the original 24. Repeating this process will reduce the number of points from 12 to 6, and then from 6 to 3. Finally, the centroid of these 3 points may be found by joining them to form a triangle, marking the midpoints of the sides, and drawing the medians from each angle to the midpoint of the opposite side. The common intersection point of these three medians represents the centroid of the original 24 points. Standard deviations (*7*) as well as regression lines and correlation coefficients (*8*) may then be calculated by various geometrical methods related to "crab addition" (*9*). Adaptations of the technique to cases in which the number of points contains factors other than 2 and 3 are being completed.

A study of centroids of unequally weighted points has resulted in the development of a number of convenient graphic procedures for handling numerical data. These include graphic methods for determining mean rate of change (*10*), fitting of straight lines according to the criterion of least squares, approximate integration by Simpson's rule, estimation of moments of area, and calculation of mean values and standard deviations for frequency distribution diagrams. Papers describing these techniques are in preparation.

S. I. ASKOVITZ
Ophthalmology Research Laboratory, Albert Einstein Medical Center, Philadelphia, Pennsylvania

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