The coleoptiles were fixed with best results in Allen's B 15 fluid, although various modifications of Flemming's and Merkel's fluids were fairly successful. Chromo-acetic acid, formalin acetic alcohol and Bouin's and Carnoy's fluids gave rather negative results. Sections were stained chiefly with Flemming's triple stain, although Heidenhain's iron-alum-haematoxylin was satisfactory, especially with a safranin counter-stain. Living material was also studied.

In general the epidermal layer is highly developed, suggesting for it a secretory function. Over the tip of the coleoptile the cells are particularly numerous, with large, deeply-staining nuclei, dense cytoplasm, small vacuoles and many granules. These cells are essentially isodiametric. Continuous with them and extending down the sides of the coleoptile, the epidermal cells gradually become longer, finally reaching a length of from twenty to forty times their width. These cells also have large nuclei and abundant contents. There is a marked contrast, both at the tip and along the sides, between these epidermal cells and the tissue immediately beneath, the cells of which have smaller nuclei and are highly vacuolate.

It is suggested that the hormone is produced in the tip cells, which would explain the well-known results of decapitation. It is further suggested that this hormone is transported to the region of bending by rapid streaming of cytoplasm in the long epidermal cells. Cyclosis has been observed in the epidermis of intact coleoptiles of all genera of grasses studied, and coleoptiles removed from young plants have shown active streaming in Russian mineral oil for a period of 840 hours under ordinary conditions. The rate corresponds roughly with the time necessary for transportation between illumination and response.

A comparison of the illuminated and unilluminated sides of the coleoptile in stained sections shows no morphological differences, and in decapitated stumps there is no immediate visible regeneration, suggesting that the presence of a hormone involves no evident difference other than change in cell size.

It may therefore be concluded that an adequate histological basis exists for the secretion and transportation of a growth hormone in the grass coleoptile.

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HASSTILESIA TRICOLOR STILES AND HASSALL, 1894—A NEW REPORT

ON February 3, 1932, the junior author brought into the laboratory viscera from two wild rabbits (Sylvilagus) killed the day before in the swamps west of Tuscaloosa, Alabama, which he had secured from some hunters. On examination of the intestinal contents of one of the rabbits, a male, the senior author found numerous trematodes. These were fixed and stained with ordinary laboratory technique and determined as *Hasstilesia tricolor* (Stiles and Hassall, 1894). As this is the first report of this species from Alabama, it was thought worth recording. The previous records, according to the Zoological Division, Bureau of Animal Industry, Washington, D. C., are from Maryland, District of Columbia, Virginia, New York, Louisiana and Texas.

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SEPTIMA SMITH

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SCIENTIFIC BOOKS

Seven-place Trigonometric Tables. By H. BRANDENBURG. xxviii + 340 pp., 2nd Edition, 1931, Alfred Lorentz, Leipzig. Price, bound, 36 marks.

Six-place Trigonometric Tables. By H. BRANDENBURG. xxii + 304 pp., 1932, Alfred Lorentz, Leipzig. Price, bound, 32 marks.

COMPUTING machines, including those that enable multiplication and division to be performed with little labor, have an ancestry that goes back several centuries, but it is only in this generation that they have been manufactured in such quantities and of such sturdiness as to make them good bargains wherever any considerable amount of computing has to be done. This news has by no means reached all the people who might profit by it, and even now multiplying machines are not in use among business men, for example, nearly as much as they deserve to be. For scientific applications (astronomy, geodesy, physics, geometrical optics and the like) the use of such machines has brought with it the necessity for natural trigonometric functions. Hitherto only the logarithms of these functions were required and were available, the computer if need be modifying his formulae, by the introduction of auxiliary quantities or similar devices, so as to transform all the operations to multiplication and division and thus to adapt them for logarithmic use. Some computers seem to be inclined to assume that these logarithmic tables are soon to be entirely superseded by the natural functions. This is surely a mistake, as in many cases the logarithmic computation is still the better. Be this as it may, there has been and is a pressing need for tables of the natural functions. Many authors have

compiled such tables in great variety, differing from each other in the number of decimal places, the intervals between successive arguments, and in their reliability. The two sets of tables before us are in the reviewer's opinion the most useful that have appeared, and ought to be on the shelves of every computer who has to deal with trigonometric formulae. They give all four functions (sine, tangent, cotangent and cosine) for every 10″. Differences and proportionate parts are always given. The arrangement is excellent and the typography is good. Both are practically free from error. They differ from each other only in that one gives six decimals and the other seven. In addition the six-place volume contains the cotangent for every second up to 3° to at least seven significant figures; and also the sine and tangent to seven decimals for every 10″ in the first degree. Similarly, the seven-place tables contain the cotangent to seven decimals (that is, up to thirteen significant figures) for every second up to 6°, and the sine and tangent to seven significant figures for every 10″ in the first degree. Considering the character of these books and the present cost of printing tabular matter, their cost is very moderate.

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The Structure and Composition of Foods. By ANDREW L. WINTON and KATE BARBER WINTON. Pp. 1–710, figs. 1–274. New York: John Wiley and Sons, Inc. 1932. $8.50.

THE Wintons, both of whom have worked for many years on food structure and food chemistry both in this country and abroad, have just issued the first volume of a series of books dealing with the morphology and chemistry of foods. This first volume deals with cereals, starch, oil seeds, nuts, oils and forage plants. It is, of course, primarily a compilation of information from all sources on the food plants of the world and is the first work of the kind in English. In addition to its thoroughly dependable assembly of references and information from others, it is unique in its very fine illustrations, consisting principally of drawings made to scale by the authors, which will be invaluable as aids in identifying different plant products by their structure. These, with a ruler which will aid in interpreting the scale drawing, all made to the magnification X 160, will be a first-class aid to pharmacognosists and food microscopists as well as to students and investigators in more scientific fields. Their work on starch deals not only with the well-known types such as potato, corn, arrowroot and sago, but gives additional information on the starch of the banana, the yam, the lotus and a great number of plants of less common use. Even the yam bean commonly grown in China in the tropics, *Pachyrhizus erosus,* is given satisfactory and definite treatment. The text is, of course, primarily intended as a reference, but contains such a wealth of information about uses and treatment of the different products that it will be found interesting as well as a school guide, although one would scarcely expect it to be adopted as a school text for any except specialists who expect to spend their lives in this field.

To ultra-moderns, who seek the very latest fashions in science as well as in dress, in one respect the book will prove a disappointment. While it deals in the most comprehensive fashion in the chemistry and detailed analysis of the products treated wherever information is available and gives the results of an immense amount of ordinary research, one looks in vain for any mention of those mysterious regulators of human and animal nutrition, the vitamins. To those familiar with the most recent developments in vitamin research, this will perhaps be more of an advantage than a drawback, for vitamin work is, of course, primarily a study of physiological reactions and not of chemical compositions. Any report made this year on vitamin content of food will need to be revised frequently in the near future to make it of any value. Until we know more of the chemistry of these substances, they will still remain for many years in the realm of the mysterious rather than that of science. Unlike most of our American reference books, this book is of truly world-wide scope. Even among the grains one finds side by side information on the Mexican teosinte and the Oriental Coix or Job's-tears, the latter being a valuable food and drug plant of the Orient, but known in this country only as an ornamental. In dealing with the oil seeds, the authors have given ample information on the principal oil plants, such as cocoanut, peanut, soy-bean, linseed and palm nut and of the common edible nuts more frequently used as desserts. Besides these, they tell us much of the composition of weed seeds. Seeds of the common buttercup are poisonous and objectionable as a mixture in grains, which may seem at first a little surprising, although the objectionable features of larkspur and its poisonous character are widely recognized. One is impressed with the number and diversity of the oil seeds of the mustard family, both of economic importance and among the weeds. Cottonseed naturally gets a large share of attention, because of its importance among oil plants.

The text of the section on forage plants is relatively brief, comprising only thirty-eight pages, but is probably ample when one considers that the economic phases of this important group of food crops are dealt with in detail by agricultural experiment stations and other agricultural research institutions.