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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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