formation and glandular secretion, we are speaking with little direct knowledge but are influenced by several suggestive facts bearing on the relation of the kinoplasm to the other structures involved. As regards the Golgi bodies, the structure which reduces osmic acid is associated with a chromophobic substance, the "idiosome," which is usually recognized only in form of spheres, (also called archoplasmic, *i. e.,* kinoplasmic spheres) such as we have observed to swell into secretory vacuoles in *Spirogyra.* Gateby's difficulty[2] in reconciling the sphere and vacuolar (Parat's theory) origin of fatty yolk seems to disappear in view of this observation. From certain drawings (*e. g.,* Bowen Q. J. M. S. 70, part 3) this chromophobic substance appears sometimes to be spread out over the Golgi apparatus. Similarly, the reducing substance in the tonoplast of plant cells is separable experimentally from the true membrane, which, like the kinoplasm generally, is at most only slightly osmophile. While the chromophilic Golgi substance may, as Bowen argues, synthesize and secrete certain vacuolar contents, we submit that the chromophobic substance which actually forms the vacuole is identical with the kinoplasm.

As regards the mitochondria, the kinoplasm is so intimately associated with this more conspicuous element that we wonder if operations have not been ascribed to the latter which really belong to the former in cells where the kinoplasm is less easy to observe than in plan cells. The relation between these two elements of the cell is shown in various ways. (1) The most abundant development of kinoplasmic processes is found in those cells and regions of a cell where mitochondria are densest. (2) The majority of the mitochondria are included in or attached to the kinoplasm. (3) A reciprocal relation is indicated by the observation that as the mitochondria are caused to increase by vital staining the active kinoplasm decreases in amount. (4) In its film form the kinoplasm occasionally stains lightly during the life by basic dyes. (5) The mitochondria are recognized as largely composed of lecithin and the behaviors of the kinoplasm are paralleled in many ways by those of lecithin and of lecithin-containing substances. Thus the kinoplasmic processes may be compared to the myelin growths of lecithin in water, while the vacuolization of kinoplasmic spheres in the cytoplasm—as also of lipoid containing droplets which may be caused to condense in the sap of many plants—is paralleled by the vacuolization and swelling of droplets of egg yolk (*e. g.,* of the cockroach) when squeezed out into water.

Our hypothesis, based on the above, as to the essential nature of the kinoplasm is that its differentiation from the cytoplasmic matrix depends on its larger lipoid content, resulting in orientation of molecules or micellae, in film formation, etc.; while the mitochondria we are inclined to regard as a reserve of substance for kinoplasm formation rather than the active elements they are claimed to be.

To sum up, while our observations tell us nothing of the process by which water and other materials are secreted in vacuoles, they certainly point to the formation of the enveloping films as a metamorphosis of the neglected kinoplasm and indicate that water at least may accumulate without the visible interaction of any other structure.

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[2] *Nature,* Dec. 11, 1926.

THE VIRGINIA ACADEMY OF SCIENCE

THE Virginia Academy of Science held its fourth annual meeting at the Virginia Polytechnic Institute at Blacksburg on May 6 and at the State Teachers College at East Radford on May 7.

The following officers were elected for the coming year:

Dr. Donald W. Davis, president.
Dr. L. G. Hoxton, member of the council.
Dr. Sidney S. Negus, publicity chairman.

Twenty-three papers were read before the section of astronomy, mathematics, and physics; twenty-nine before the section of biology; thirteen before the section of psychology and education; and twelve before the Virginia section of the American Chemical Society which functions as a section of the academy.

A prize of fifty dollars in gold offered by a friend of the Academy for a particularly meritorious paper read at the meeting was awarded to Dr. C. C. Speidel, of the University of Virginia, for a paper entitled "Regenerative Phenomena under Conditions of Hyperthyroidism." This prize was awarded by the permanent committee on the encouragement of research in Virginia which was established last year. President Horsley reported that he had succeeded in raising more than eight thousand dollars toward an endowment fund for the encouragement of research in Virginia, the income from which will be administered by this committee. A committee was also appointed to effect the incorporation of the academy.

After the meeting about eighty of the biologists made a field trip to Mountain Lake and about twenty of the chemists visited some of the industries at Pulaski.

E. C. L. MILLER,
Secretary-Treasurer