obtained. The blood cultures of the animals treated with bacteriophage alone showed no evidence of the bacteriophage. The blood cultures of those treated with antitoxin and bacteriophage showed phaged colonies.

The presence of bacteriophage in these colonies was determined by subcultures on plain agar slants and in broth tubes. The plain agar subcultures showed the characteristic ragged growth. The broth tubes were filtered after 24 hours' growth and bacteriophage was found in the filtrates by the serial dilution method previously described[1] Bacteriophage could not be found in the colonies from the rabbits treated with bacteriophage alone or with antitoxin alone. There was no change in the colonial form of the staphylococci recovered from the animals treated with antitoxin alone.

From these results it is apparent that the antitoxin has some effect on the bacteriophage that allows it to survive and act on the staphylococci in the presence of normal rabbit blood. No explanation of this phenomenon can be offered at this time.

7002 P

Structure and Function of the Yolk-sac Placenta in Mus norwegicus albinus.

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Although the relative functions of the yolk-sac and allantoic placentas in rodents are still uncertain, the following considerations indicate that the former has greater importance than is generally recognized. Goldmann[1] observed that the highly colloidal acid-azo dyes do not enter the chorionic villi of the rat placenta, but pass through Reichert's membrane and are stored superficially in the "yolk-sac epithelium." Brunschwig[2] has demonstrated that the yolk-sac is the route of entrance of iron salts into the 9-day blastocyst. Furthermore, the present experiments show that the neutral red accumulation in the yolk-sac epithelium exceeds that in any other embryonic tissue when an early blastocyst is placed in a solution of the dye. Also, when embryonic loci of from 11 to 13 days'

[1] Goldmann, E. E., *Beiträge z. klin. Chirurg.*, 1912, **64**, 1.

[2] Brunschwig, A. E., *Anat. Rec.*, 1927, **34**, 237.

gestation are perfused by way of the uterine artery with a solution of toluidin blue in saline, the dye passes into the embryo by way of the yolk-sac and the vitelline veins. When pregnant females of 16 or 18 days are injected intravenously with trypan blue, the only embryonic tissue in which dye is found 1 to 2 hours later is the portion of the yolk-sac epithelium which rests against the placental disc. The dye diffuses through the base of the placenta, rather than through the extremely thin "plates" of the chorionic villi.

The yolk-sac epithelium is composed of columnar cells. An ellipsoidal or spherical nucleus is located at the base of each cell until the 10-day stage and then is displaced upward by a cluster of fat droplets. Beneath the cuticular border of the cell is a granule-containing layer. Between it and the nucleus lies a region which is vacuolated in fixed material.

This vacuolation, first described by Sobotta,[3] is not a fixation artifact. In sections of material fixed in Zenker-formol or chrome-osmic mixtures a distinct wall may be seen about the structure. Osmic acid blackens the wall faintly about the more apical margins and densely along the inferior borders, especially in the frequent perinuclear diverticula. In Zenker-formol preparations stained with Altmann acid-fuchsin, the entire element, when contained within a single section, stands out definitely as a reddish sac. It can be seen in unstained pieces of epithelium mounted in hanging drop, and is conspicuous when certain supravital stains are employed.*

The selective staining of the yolk-sac by neutral red or trypan blue is due to the large amount of dye which these intracellular vesicles absorb. Nile blue sulphate, which ranges from deep blue in aqueous solution to orange-amber in neutral fat, with intermediate colors in certain lipoid mixtures, stains the vesicle a pale violet. Spherical granules of varying sizes at its surface are dense blue. In epithelium stained with toluidin blue, brilliant cresyl blue, thionin, or aged methylene blue, the dye is reduced to the leuco base in the lower regions of the cell and remains intensely colored in the supra-nuclear region. Here the color is not the blue of a watery solution, but reddish violet. This effect is partly due to the assumption of the violet color by the vesicle. Densely blue short rods cling to the vesicle's surface or lie within, where they are in rapid Brownian movement. Wherever these metachromatic dyes are red or violet one may assume that they are there dissolved in a substance of low

[3] Sobotta, J., *Arch. f. mikr. Anat.*, 1911, **78**, 271.

* Observations were made of hanging drop preparations with an aprochromatic oil-immersion objective and compensating oculars.

dielectric constant. The osmic acid and Altmann techniques, indicate that such a substance, a lipoid, is localized in the wall of the vesicle.

The shape of the vesicle is in constant flux, diverticula being slowly formed, retracted, or fused together. On several occasions spherical bodies have been seen to form from these diverticula. One of the bodies became highly refractile and meanwhile its color changed to the orange-amber of the fat droplet in the base of the cell.

All observations indicate that the vesicle is an extremely irregular sac, having a lipoidal wall, and filled with a fluid of low viscosity. Although the composition of the wall and the relation to the nucleus suggest that the element is the Golgi vacuome, such a conclusion seems premature until further investigations have been made.

7003 C

Pinacyanol as a Histological Stain.

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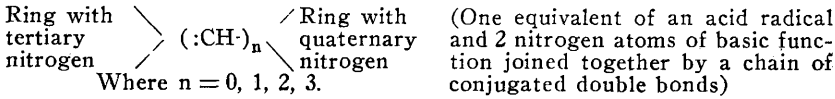
Pinacyanol is a dye belonging to the cyanine group. During the last 10 years great advances have been made, chiefly by Mills[1] and his coworkers, in the preparation and elucidation of the chemical constitution and photographic properties of the cyanine dyes. There are about 37 different types of cyanine dyes known.

The cyanine dyes have the peculiar property of conferring extra sensitiveness on silver halides, which are only sensitive to the blue and violet regions of the spectrum. If the proper dyes are added to the emulsion, or if the films are bathed in the solution, they become extremely sensitive to red, yellow, orange, green and to the invisible infra-red portions of the spectrum. This sensitizing property is probably due to the following characteristic molecular grouping present in all sensitizing cyanine dyes:



The cyanine dyes are strongly basic dyes, the monoacid salts are

[1] Doja, M. Q., *Chem. Rev.*, 1932, **11**, 3.