distance between the heavy vertical lines 0.2 second as on ordinary electrocardiograms. Our overall results are shown in Table I.

Attention should be drawn to Case 5. Here the QRS is .12 second and incomplete right bundle branch block is present. But the onset of the pulmonary artery upstroke is .05 second ahead of the onset of the upstroke of the ascending aorta, a result well outside the normal range, but in a direction opposite to that expected. In Case 18, with left bundle branch block (QRS .13), the onset of the upstroke of the ascending aorta is .03 second ahead of the onset of the upstroke of the pulmonary artery, again a relation outside the range of normal, but in a direction opposite to that expected.

We are continuing investigations of this problem in cases of ventricular premature beats and Wolff-Parkinson-White syndrome, but our results to date indicate lack of correlation between electrical and mechanical events in these instances also.

Summary. In a study of 25 cases of bundle branch block, we have found no correlation between the electrical and mechanical phases of the cardiac cycle in 17 cases. Furthermore, in two cases of bundle branch block, an abnormal mechanical relationship between the onset of ejection in the pulmonary artery and ascending aorta was noted in a direction opposite to that expected.

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Content and Distribution of Glycogen in *Schistosoma mansoni.** (17755)

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Carbohydrate metabolism of *Schistosoma mansoni* proceeds at an exceedingly high rate. These trematodes utilize in one hour an amount of glucose equivalent to almost one-fifth of their dry weight(1). In the course of investigations concerned with the carbohydrate metabolism of schistosomes, a study was made of the content and distribution of glycogen in these helminths.

Methods. The flukes were removed from the mesenteric and portal veins of mice infected 6 to 23 weeks previously by the intraperitoneal injection of 160 cercariae of *S. mansoni.* The worms were placed in an ultrafiltrate of ox serum. After separation of the males from the females, both sexes were divided into two groups. A predetermined number of one group (5 males or 30 females) was used for the determination of glycogen, another for that of the dry weight. Glycogen was determined by a previously described modification(2) of the method of Good, Kramer and Somogyi(3), or by the colorimetric procedure of Seifter and Dayton(4). In the latter procedure, filter No. 60 of the Klett-Sumerson colorimeter was substituted for filter No. 62, since this resulted in a higher sensitivity and in a better proportionality between extinction and glycogen concentration. Provided the glycogen was precipitated prior to colorimetric analysis, results obtained by the two methods agreed within 3%. The other group of worms was rinsed quickly in distilled water, placed in small tared cups and dried to constant weight at 90°C. Glycogen content was calculated from the total amount of glycogen found and the dry weight of a similar number

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of worms.

A histological study was made of the distribution and amount of glycogen in the various organs and tissues of adult schistosomes. The worms were fixed immediately in a freshly prepared solution consisting of saturated alcoholic picric acid (33 ml), concentrated formalin (6 ml), and glacial acetic acid (2 ml). Fixation time was about 18 hours. Dehydration was accomplished by 3 changes of absolute isopropyl alcohol followed by 2 changes of thirty minutes each in xylol. The tissues were first overstained in alum hematoxylin without bluing, dipped in Best's differentiating solution (methyl alcohol, 10 ml, and 50% ethyl alcohol, 45 ml), and then placed for about 15 minutes in the glycogen staining solution† until the granules were a vivid red. They were then differentiated by brief but thorough agitation, dehydrated in 2 changes of absolute isopropyl alcohol, cleared in xylol and mounted.

Results. The analytical data are recorded in Table I. Glycogen content of the males was 3 to 6 times greater than that of the females. In the latter the quantity of glycogen did not vary with the age of the worms. In contrast, the glycogen stores of the males tended to increase with age, although not in every instance.

The histologic distribution of glycogen was similar to that noted by Axmann(5), and the material occurred mainly in the form of fine or coarse granules. In all worms the deposit was limited principally to musculature, parenchyma, tubercles, and suckers. None was present in cuticle or subcuticle, excretory

TABLE I.
Glycogen Content of Schistosomes.

Weeks after inj. of cercariae	% glycogen (dry matter)	
	Males	Females
6	14.3	4.3
	15.8	5.0
	13.6	
	14.8	
7	15.6	4.2
	17.2	3.8
	19.6	4.6
	16.6	
8	18.7	4.5
	18.3	
	17.3	
9	18.7	4.8
	16.8	2.7
	17.8	4.3
	18.2	
	16.2	
	17.6	
10	16.1	4.3
	18.4	3.9
	18.8	4.6
	17.3	
11	18.4	4.8
	18.4	4.1
	19.3	
	18.6	
13	22.2	4.5
	18.4	4.2
	19.8	
	17.8	
	20.2	
14	18.7	3.9
	15.9	4.6
	15.8	4.3
	20.3	
	19.6	
	18.8	
16	17.7	4.4
	20.8	4.9
	22.2	
	19.3	
19	21.0	3.8
	17.1	4.5
	20.1	4.1
	22.2	4.3
	26.6	
	22.4	
	22.6	
	21.4	
	23.2	
22	22.6	4.2
	29.0	3.6
	18.6	
	21.8	
	22.4	
23	25.8	4.7
	21.5	4.0
	22.0	
	20.1	
	22.2	

† This is prepared from a stock solution consisting of carmine, 0.4 g; potassium carbonate, 0.2 g; potassium chloride, 1.0 g, and distilled water, 12 ml. The ingredients are mixed and brought to a boil. The solution is not removed from the flame until it has turned a deep red color and has developed a froth. After slight cooling, 4 ml of concentrated ammonium hydroxide are added. For use the above quantity of a stock solution is diluted with 15 cc of concentrated ammonium hydroxide and 15 ml of methyl alcohol. The mixture should become turbid on addition of the methyl alcohol.

5. Axmann, M. C., *J. Morphol.*, 1947, v80, 321.

system or sexual apparatus, although occasionally, there was slight interstitial deposit in the testis. The intestinal crura were essentially negative except for fairly frequent scant punctate granular deposits in the outer rim of cytoplasm of the lining cells.

Male and female worms showed a similar distribution of glycogen. However, the amount was distinctly less in the female than in the male and sometimes apparently out of proportion to difference in size. This is explained by the less well-developed musculature and parenchyma of the female worm and also by the relatively more abundant sexual apparatus which is glycogen negative.

The histological studies permitted only a rough quantitative estimate of the amount of glycogen present. In spite of this, the quantity of glycogen in male worms from the longer periods of infestation usually exceeded that present in the early stages. In the former, the glycogen was often found in coarser, more compact granular form within musculature and body parenchyma. However, the location of the glycogen remained the same.

Summary. From 13.6 to 29.0% of the dry matter of the males of *S. mansoni* consisted of glycogen. In females the amount varied between 2.7 and 5.0%.

The glycogen in both male and female worms was deposited principally in the musculature and parenchyma. The relatively small amount in the female is explained by the less well-developed musculature and parenchyma and the more abundant sexual apparatus which is glycogen negative.

Histological studies were in general accord with the quantitative observation that the amount of glycogen in the male tends to increase with age.

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Studies of Influenza A (PR8) Infected Tissue Cultures by Electron Microscopy.* (17756)

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The growth and development of a virus may be studied in the cells upon which it is parasitic. In the course of such studies, by means of a tissue culture technic(1,2), we have found that there is a very close association between the formation of the typical spheres of influenza virus and the elongated rod-like filaments previously shown in centrifuged influenza infected allantoic fluid(3-6). Previous observers have noted that rod-like forms occur in ultracentrifuged allantoic fluids infected with several strains of influenza virus including newly isolated strains (4,7,8) and that they adsorb and elute from red cells along with the spherical virus particles(7). Moseley and Wyckoff(4) have noted the occurrence of segmentation on the rods and consider this as evidence for a conversion between rod-like and spherical forms.

We have confirmed these observations and have noted rod forms in all three major types (Influenza A PR8, Weiss,‡ W. S.,‡ and FM

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† National Institutes of Health Fellow.

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