in total length. In another series incubated at a temperature of 27° C. over a 2 week period, egg yolk diet produced an increase in total length of 32%, while a diet of blended egg yolk and albumin in equal parts gave an increase in total length of 51.5%. In a third series pastes were made of 15% liver pulp and 45% starch paste (10%) with the addition of 40% egg yolk or egg albumin or a mixture of equal parts egg yolk and albumin. The starch and liver pulp were added for purposes not connected with this paper. The worms were fed over a 3 week period and were kept incubated at a temperature of 23° C. Only a few of those fed upon albumin were able to survive the experimental period. The group of worms fed upon egg yolk gained 16.8% in total length, while those fed a mixture of yolk and albumin gained 68.1%.

It will be noted that in the experiments cited which were of 2 weeks duration a yolk-albumin mixture exceeded yolk alone in growth-promoting power by 16.3% and 19.5% respectively. In the 3 week experiment, the mixture of egg yolk and albumin in equal parts exceeded yolk in growth-promoting power by 51.3%. When albumin is fed alone a negative growth is obtained.

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Body Fluid of the Mammalian Embryo as a Medium for Tissue Culture Work.

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The exudates in the peritoneal cavity of the frog and guinea pig have recently been used[1] as culture media for cultures *in vitro*. In the present experiments, various tissues of the albino rat have been successfully cultivated in the peritoneal cavity exudate of the same animal. However, the growth of certain tissues, which it was particularly desired to cultivate was not so vigorous as hoped for. Consequently an endeavor was made to find a culture medium better adapted for the cultivation *in vitro* of these tissues.

Attention was centered upon a medium containing embryonic tissue juice because of the favorable results obtained by various in-

[1] Baitsell, G. A., and Sherwood, M. B., PROC. SOC. EXP. BIOL. AND MED., 1925, xxiii, 96.

vestigators with this type of medium. It was felt, however, that the usual method of obtaining the embryonic tissue juice by mincing the embryonic tissues in a saline solution might be improved upon by using body fluids normally present in the embryo. There was the possibility that these fluids might contain the growth promoting substances and thus obviate the necessity of adding embryonic tissue juice to them.

In working with newborn albino rats it was observed that a clear fluid would flow from little cuts in the skin, and it was decided to try this exudate. However, there was considerable difficulty in getting a sufficient supply for use as a culture medium. It was found that a much more abundant supply of body fluid could be obtained from the embryo by inserting the point of a fine bore pipette through the skin and frontal bone into the underlying cranial cavity. Care should be taken not to insert the point of the pipette too deeply or the brain tissue may be disturbed and bits of it be taken up into the pipette. However this material, as well as blood cells, can easily be removed by centrifuging. If the point of the pipette is in the proper position, a clear fluid flows into it as soon as one releases the pressure on the bulb. It was later found that the best results were noted when the fluid was obtained from foetuses between 18 and 20 days of age, although somewhat younger embryos may also be used. Fluid sufficient to make several cultures can usually be obtained from one embryo.

Tissues from several organs, notably, brain, ependyma, liver, spleen, testis, intestine, as well as striated muscle tissue and connective tissue from various regions, were cultivated in this embryonic body fluid culture medium with excellent results. It was seldom that the explant did not show some signs of growth, and in many cultures very large growths were obtained. Explants of ependyma, liver, spleen, and connective tissues from the leg, when taken from embryos 19 or 20 days of age and supplied with body fluid from embryos of the same age, gave the best results. The first signs of growth are, in some cases, to be observed after only a few hours of incubation. Cultures which show no activity by the end of the first 24 hours rarely show any growth later. After 3 days of incubation, active growth in the cultures usually stops, and it is necessary to make subcultures and supply fresh medium to insure continued activity.

Some experimental evidence has been obtained indicating that the body fluid as found in the different regions may show a certain amount of specificity for the tissues with which it comes into direct

contact when in its natural position. Thus it was observed in a number of cases, that when the body fluid obtained from the cranial cavity, as described above, is used, the first cultures to show activity are those containing explants of the tissue lining the cranium.

My thanks are due to Dr. R. G. Harrison for the laboratory facilities at Yale; to Dr. G. A. Baitsell, at whose suggestion the experiments were started; and to Dr. J. S. Nicholas for supplying the animals that were used in these experiments.

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Acute Dilatation of the Stomach.*

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In a previous communication we[1] have reported that the total loss of gastric juice from the body causes death in the dog in from 5 to 10 days, with symptoms of depression and marked changes in the blood chemistry. These may be summarized as follows: a progressive decrease in the concentration of blood chloride, an increase in the CO_2 capacity, an increase in the pH, and a late increase in the N P N and Urea N. Water and salts are not absorbed to any appreciable extent in the stomach or duodenum and it is therefore clear that any factor such as obstruction at the pylorus or in the duodenum, gastric or duodenal fistula, or profuse persistent vomiting, will lead to this loss of gastric juice constituents through failure of reabsorption in the lower intestine. It is likely that the property of the gastric mucosa, by virtue of which it can continue to separate the elements for its secretion from the altered blood plasma until death is produced, is of major importance in the pathogenesis of these disorders. In the present communication we wish to report a case of acute post-operative dilatation of the stomach together with evidence which indicates that here also the failure of reabsorption of gastric juice is the cause of death.

The patient, a female of 70, was brought to the hospital with a strangulated femoral hernia. The findings are unimportant for the

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[1] Dragstedt, L. R., and Ellis, J. C., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 305.