The contents of the small intestines of rats, and the feces of rats, have been shown to have a pH above normal on a rachitic regime of the low phosphorus type, while curative procedures reduce the pH to normal.[1, 2, 7] There is evidence that cod-liver oil, ultra-violet light, or the ingestion of acid or alkali, affect the degree of absorption of phosphate (and calcium) from the intestine.[4, 5, 6] That the primary defect in rickets is an impairment of absorption has been argued before. These experiments add evidence for this view. The pH of the intestinal contents, with the consequent effect on the solubility of phosphate (and also of calcium, magnesium, and iron) offers a mechanism whereby the effect of such agents as light and cod-liver oil may be linked with the inorganic metabolism.

The addition of 10 gm. of calcium lactate (2 dogs) or of dibasic calcium phosphate (2 dogs) to the rickets-producing diet was also found to give the same intestinal pH values as did the normal diet. The relation of this to possible anti-rachitic effects, and the mechanism whereby the pH is controlled physiologically, are subjects for further research.

This is a preliminary report.

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3513

Biochemical Studies of Human Semen and the Mucin of the Cervix Uteri. I.

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The plug of mucous filling the cervical canal and the external os is very viscous and adhesive, and when pulled away from the cervix it forms a slimy string which is broken with difficulty. In cases

presenting no pelvic pathology the mucous is semi-transparent; when there is a lesion such as an infection, laceration, eversion, or erosion, the cervical mucous tends to become muco-purulent in character and more adhesive. The mucous plug consists very largely of a mucin and water. It presents, unless altered, a very considerable barrier to the passage of spermatozoa.

When a shred of mucous is placed in a test tube with semen and incubated, within 30 min. it becomes dull in appearance and the edges of the shred are frayed and fragmenting; in 12 to 24 hours the shred has entirely disappeared. In control tubes, containing no semen, the mucous shred remains intact and does not change in appearance. This lytic action is influenced by pH. Using phosphate buffers, maximum activity was found to occur in two ranges, pH 5.28 to 5.90 and 7.37 to 8.04. Between these optima the action is less; beyond them, also less; below 4.0 there is no action; above 10 equal digestion occurs in both the control tubes and the tubes containing semen, suggesting a solvent action due to alkalinity.

The lytic action seems to be specific to a high degree. Semen will not digest shreds of fibrin, egg white, or casein, either in acid or alkaline medium; it was found to have no effect on small masses of respiratory or salivary mucins. The shreds of cervical mucin are highly resistant to pepsin and trypsin.

The substance responsible for the action is thermolabile; it can be precipitated by phosphomolybdic acid or alcohol; it does not dialyze through a collodion membrane. It seems not to deteriorate during five days standing in the cold. The facts suggest that the solvent action of semen on a mass of cervical mucin is enzymic.

In clinical observation, the lytic action of the semen on the mucous is seen to occur *in vivo* after coitus. The presence of the lytic substance does not depend on the presence of spermatozoa. A specimen of semen containing no spermatazoa dissolved the mucous. Semen from a case of Froelich's Syndrome, containing a few dead spermatozoa, was inactive. A sample containing a normal number of motile spermatozoa was found to be inactive (this case was the husband in a sterile marriage, the wife being normal).

Tests made with mucous from a patient with a leucorrheal discharge due to a lacerated cervix, and from one with acute gonorrhea, indicated that the digesting action of normal semen is markedly diminished or stopped by the presence of pus in the mucous.

The experiments described suggest that the lytic substance may be an important factor in the passage of spermatozoa up the tract, and that its absence may be an etiological factor in some cases of sterility in which no explanation has hitherto been offered.

We were unable to extract any of the lytic material from the testis of a bull. The origin may be in the testis, prostate, or seminal vesicle.

Semen strongly reduces thionin to a colorless compound. The material responsible for this reduction is thermostabile, dialyzable through collodion, and is carried down by precipitation with phosphomolybdic acid, alcohol, or std. ammonium sulphate.

Semen, with guaiac or benzidine, shows no indication of oxidase or peroxidase. It contains catalase. It does not contain glutathione. It is very strongly buffered.

This is a preliminary report.

3514

Weight of Mouse Embryos 10-18 Days After Conception, a Logarithmic Function of Embryo Age.

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The following methods were adopted in the endeavor to provide the optimum developmental conditions and to reduce the variability of the mouse embryos as far as possible. The mothers were self-colored, intense, brown-agoutis, F_1 hybrids between two highly inbred, pedigreed strains, the females from the Bagg albino and the males from the Storrs-Little, characterized by pink-eyed dilute brown self-color. The albino grandmothers at conception were over ten weeks old and had not nursed young for at least three weeks; the mothers were nursed in litters that had been cut down to six at birth; they were weaned at four weeks and held in large mating boxes, not more than six to a box, until over three months old before mating was first permitted. The fathers of the embryos weighed came from the inbred line 89,-self-colored, intense, brown-agouti; they were kept individually in small boxes. This type of mating gives embryos that may be called triple hybrids; they bear the maximum heterozygosity and hence show the minimum amount of segregation. When matings were desired each male was placed with the females in a certain box for one hour and the females then examined for vaginal plugs as evidence of copulation. Each female with a plug was immediately given a small box to herself until the