pair was apparent, and neither fatty infiltration nor marked atrophy was observed.

In an endeavor to throw some light on the poor and variable response to the injection of massive doses of α-tocopherol, a finding in harmony with Demole's results in rats,[5] we prepared the water-soluble sodium phosphate of α-tocopherol according to the procedure of Karrer and Bussmann.[7] Since the purity of our preparation was not determined, the doses employed represent maximum values only. Aqueous solutions containing the equivalent of 20 and 30 mg of α-tocopherol were injected subcutaneously into 2 dystrophic rabbits. The high urinary creatines of the 2 rabbits fell to 10 mg daily in 8 and 9 days respectively. There was a prompt growth response and the physical symptoms disappeared within a few days. This suggests that the activity of injected vitamin E in rabbit dystrophy, as in rat sterility,[5, 7] is determined largely by its physical state.

Conclusions. The oral administration of 20 mg of α-tocopherol to dystrophic rabbits produces a rapid fall in the urinary creatine. Following the parenteral administration of the same dose, the creatine remains at a high level, and the creatinine decreases. The injection of massive doses of α-tocopherol cures dystrophy in some cases, while in others it extends life and promotes growth for several months without curing the symptoms of the disease.

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Clinical Fetal Electrocardiography. Its Practical Accomplishment.

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The recording of the electrocardiogram of the human fetus *in utero*, although long attempted (Cremer,[1] Foá[2]), has been only indifferently successful even late in pregnancy.[3, 4, 5]

We have developed a technic of definite clinical value by using a

1 Cremer, M., *München med. Wchnschr.*, 1906, **53**, 811.

2 Foá, C., *Giornale della R. Acad. di Med. di Torino*, 1911, **4**, 90.

3 Strassmann, E. O., *Proc. Staff Meet. Mayo Clin.*, 1938, **13**, 251.

4 Bell, G. H., *J. Obst. and Gyn. Brit. Emp.*, 1938, **45**, 802.

5 Mann, H., and Bernstein, P., *Am. Heart J.*, 1941, **22**, 390.

single stage resistance-coupled amplifier (successfully employed[6] on the embryo chick heart) with a conventional portable electrocardiograph. The baseline of the tracing was stabilized by means of series condensers of 0.001 to 0.05 microfarads capacities which were coupled to the lead wire when needed for damping the respiratory artefacts of the mother. The fetal heart potentials, picked up by disc electrodes on the pregnant subject's abdomen (xiphoid-pubis application to minimize the pickup of the maternal electrocardiogram) were amplified 20 times, thereby bringing the fetal electrocardiogram into plain view while keeping that of the mother within the limits of recording of the apparatus. The amplifier measures 9 x 5 x 7 inches, weighs 12 pounds, is constructed of standard radio parts, is simple to operate, and together with the electrocardiograph makes an easily portable device.

With this technic we are able to record the action current of the fetal heart in virtually all instances during the last 2 months of pregnancy, usually in the sixth and seventh month, and frequently in the fourth and fifth month. Fig. 1 illustrates a typical result, and Fig. 2 shows one of our best.

As is obvious from the illustrations, the baseline irregularity is the present limiting factor, for it tends to obscure the characteristically small fetal electrocardiogram of early pregnancy. These artefacts

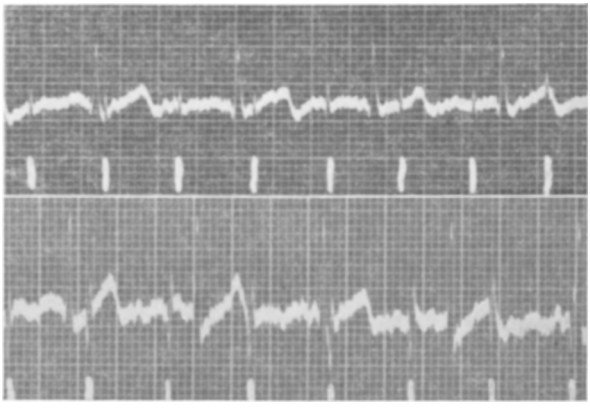

FIG. 1 (above). FIG. 2 (below).

FIG. 1. Tracing typical of those usually obtained. Fetal electrocardiograms indicated by marks at 0.39 sec. intervals (fetal heart rate 154/min.). Pregnancy in 21st week before term.

FIG. 2. Tracing obtained in 5th month of pregnancy. Fetal electrocardiograms indicated by marks at 0.42 sec. intervals (fetal heart rate 143/min.).

[6] Hoff, E. C., Kramer, T. C., Du Bois, D., and Patten, B. M., *Am. Heart J.*, 1939, **17**, 470.

probably arise from fibrillary movements of muscle and from external electrical phenomena; experiments to determine their nature and to eliminate them are under way.

The technic permits the prompt differential diagnosis of pregnancy from other abdominal tumors, it is free from false positive results, and it is less time consuming than biological tests for pregnancy. A positive result is certain proof of life of the fetus. Finally, the detection of twin pregnancy becomes possible earlier than by any other method of examination.

We believe that clinical fetal electrocardiography is now a practical laboratory accomplishment and represents a useful clinical aid.

We are grateful to Mr. H. Harwell and Mr. R. K. Hellman of the Connecticut Telephone and Electric Corporation of Meriden, Conn., for the amplifier employed in these experiments.

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Influence of Cell Concentration on Respiration Rate of Sperm.*

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Numerous experiments have demonstrated that as the density of a population within a limited, closed system increases, the physiologic limitations imposed upon the individuals making up the population progressively increase. Thus, it has been shown that egg production of Drosophila confined within a limited space declines with increasing density of population.[1] Sea urchin sperm, inactive in the testis, have been shown to become very active at low concentrations in seminal plasma, and to exhibit a progressively increasing respiration rate accompanying increasing dilution with sea water.[2] Marine biologists are familiar with this phenomenon. A large increase in respiration rate of sperm of the fowl on reduction of concentration to 1/5 the original level has been reported.[3]

If the respiration of mammalian sperm cells similarly varies with

* Contribution from the Department of Animal Husbandry, Missouri Agricultural Experiment Station. Journal Series No. 778.

1 Pearl, Raymond, *J. Exp. Zool.*, 1932, **63**, 57.

2 Gray, J., *Brit. J. Exp. Biol.*, 1928, **5**, 337.

3 Winberg, Hakan, *Arkiv. f. Zool.*, 1939, **32A**, No. 7.