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Artificial Fever as a Contraceptive.*

JOHN A. CAMERON.†

From the Department of Anatomy, University of Missouri, School of Medicine, Columbia, Mo.

The termination of third day pregnancies in the rabbit by artificial fever was described in an earlier report.[1] The method employed allowed 10 minutes for raising the temperature of the water bath from 100°F to 113°F. Twenty minutes later (30 minutes after immersion) the animals were removed from the bath to have rectal temperatures recorded and then returned to the bath for gradual return to room temperature. The initial rectal temperature of each was known, but the actual time the rectal temperature reached its maximum was not known. Therefore the duration of the period of maximum temperature was unknown.

In the experiments now described the same general procedure was followed except that the 20-minute fever period was counted from the time the anal temperature reached 108°F. This assured that the whole time was spent at the fever temperature, further checked by thermometer readings every 5 minutes.

Each of the 10 does employed had previously borne a normal litter by one of the bucks used in the experimental matings. Sixteen experiments were completed with the 10 does.

The time of acceptance of the buck was recorded for each doe, and, since ovulation is known to take place about 10 hours after mating and fertilization to follow almost immediately,[2] each doe was given a fever treatment between 3 and 12 hours after mating. Litters were produced in 10 of the 16 cases. Examination of the records showed that the 6 not producing litters were all given fever treatment during the 6½ hours following mating while the 10 producing litters received fever treatment 7 to 12 hours after mating. Table I shows for each case the time elapsed since mating, the temperature when the treatment began, and the temperature during the fever period.

Summary. These data indicate that during the first half of the 12-hour period between insemination and fertilization in the rabbit

TABLE I.
Elevations in Temperature of Rabbits During Artificial Fever Treatments and Time Elapsed After Mating in Littering and Nonlittering Does.

Litters Produced.				No Litters Produced.			
Case No.	Time after mating hr min	Normal T°F	Fever T°F	Case No.	Time after mating hr min	Normal T°F	Fever T°F
1	9 40	103.3	110	11	6 30	103.8	110
2	10 17	103.0	109	12	3 22	103.7	108
3	10 22	106.0	110	13	3 40	103.6	109
4	9 18	104.5	109	14	5 46	103.3	110
5	9 20	104.0	110	15	4 30	103.8	109
6	7 30	102.0	109	16	4 50	103.2	109
7	7 25	104.0	109				
8	7 0	102.6	110				
9	12 0	103.5	109				
10	11 0	103.0	109				
Avg	9 20	103.6	109.4	Avg	4 43	103.6	109.2
Avg elevation, 5.8°F.				Avg elevation, 5.6°F.			

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† Now at the Department of Anatomy, Baylor University School of Dentistry, Dallas, Texas.

1 Cameron, J. A., PROC. SOC. EXP. BIOL. AND MED., 1943, **52**, 76.

2 Pincus, G., and Enzmann, E. V., *J. Exp. Biol.*, 1932, **9**, 403.

one or both gametes can be fatally injured by 20-minute exposure of the adult female to temperatures of 109°-110°F, involving elevation of general body temperature of 5°-6°F. During the second half of the same period like treatment has no observed effect, but, as previously reported[1] another period of susceptibility to heat is experienced on the 3rd day after mating.

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Chemotherapeutic Properties of Streptomycin.

HARRY J. ROBINSON, DOROTHY G. SMITH, AND OTTO E. GRAESSLE. (Introduced by H. Molitor.)

From the Merck Institute for Therapeutic Research, Rahway, N.J.

The search for a chemotherapeutic agent effective in the treatment of gram-negative bacterial infections recently led to the isolation of streptothricin.[1] This agent was shown to be active *in vitro*[2,3] and *in vivo*[4,5,6] against a variety of gram-negative bacteria. Streptothricin was also shown to be active *in vitro* against the tubercle bacillus.[7,8]

More recently, a second substance was isolated in crude form from a micröorganism called *Actinomycetes griseus*, which was named streptomycin.[9] Like streptothricin, this substance was found to be active against gram-negative bacteria *in vitro* and *in vivo*.[10] The available data suggest that, with the exception of a few microörganisms, the *in vitro* activity of streptomycin appears to be identical with that of streptothricin. Our findings show that a noteworthy difference between these two substances seems to be in the greater activity shown by streptomycin in infections produced by certain pathogenic bacteria, and also in the lower toxicity of streptomycin.

The present report is mainly concerned with the comparative value of streptomycin and streptothricin as chemo-therapeutic agents in the treatment of gram-negative and gram-positive infections in mice.

Materials and Methods. With the exception of the streptomycin, the materials and methods of the *in vitro* and *in vivo* assays have been reported in previous communications, and will therefore not be described in detail here.[6] The streptothricin W and streptothricin F used were the same as those reported in a recent paper.[11] The streptomycin was kindly supplied by Dr. S. A. Waksman of Rutgers University, and Drs. M. Tishler and R. Denkewalter of the Research Laboratories of Merck & Co., Inc. The potency of this substance was 27 to 100 units per mg of solid, one unit being that quantity of streptomycin which will just inhibit a given strain of *E. coli* in 1 ml of nutrient broth or agar, as described by Waksman *et al.*[10] The streptothricin unit differs somewhat from the streptomycin unit and has been described by Foster *et al.*[3] The inhibitory action of these substances on the growth of bacteria and fungi *in vitro* was determined by incorporating the drugs in agar and streaking the surface of the

1 Waksman, S. A., and Woodruff, H. B., *J. Bact.*, 1940, **40**, 581.

2 Waksman, S. A., and Woodruff, H. B., PROC. SOC. EXP. BIOL. AND MED., 1940, **45**, 609.

3 Foster, J. W., and Woodruff, H. B., *Arch. Biochem.*, 1943, **3**, 241.

4 Robinson, H. J., Thesis, Rutgers University, 1943.

5 Robinson, H. J., Graessle, O. E., and Smith, D. G., *Science*, 1944, **99**, 540.

6 Robinson, H. J., and Smith, D. G., *J. Pharm. and Exp. Therap.*, in press.

7 Foster, J. W., and Woodruff, H. B., in press.

8 Schatz, A., and Waksman, S. A., in press.

9 Schatz, A., Bugie, E., and Waksman, S. A., PROC. SOC. EXP. BIOL. AND MED., 1944, **55**, 66.

10 Jones, D., Metzger, H. J., Schatz, A., and Waksman, S. A., *Science*, 1944, **100**, 103.

11 Robinson, H. J., Graessle, O. E., and Silber, R. H., *J. Pharm. and Exp. Therap.*, in press.