TABLE III. Mean Values for Fatty Acid Content of Liver Obtained from Rats Exposed to Radial Acceleration Listed by Experimental Group and Samples.

Exp group	Sample size	Liver lipids (g per 100 g liver × 100) Sample 1 mean	Sample 2 mean	Group mean
A	6	3.88	3.71	3.80
B	10	4.01	4.27	4.14
C	9	3.75	3.76	3.76
D	7	3.28	3.10	3.19
E	9	3.02	3.22	3.12

term acceleration stress is the dramatic change in metabolism of the 3 primary foodstuffs: carbohydrate, fat, and protein(1,2,7). Oyama(3) has shown that rats exposed to relatively high *g*-fields for prolonged periods readily adapt to their new environment. The animals appeared to be healthy; they gained weight at a somewhat slower rate and if the gravitational field was not too high, they were able to carry on certain normal physiological functions such as reproduction. Investigation of the effects of short-term exposure to increased *g* showed an increased incorporation of C^{14}-acetate to lipids(2). The principal effect in animals so treated was in the amount of acetate incorporated into fatty acids.

In the present study, it was shown that prolonged centrifugation of rats did not affect the incorporation of acetate to fatty acids, but, did affect the incorporation of acetate into nonsaponifiable lipids. This effect was noted only when the gravitational field was at 4.7 *g*, the level that approaches the tolerance limit(3). Current studies indicate that changes occurring as a result of acute acceleration are mediated by the neuroendocrine system(8) which are then modified or adapted after prolonged exposure.

Summary. From weaning until 1 year of age female Sprague-Dawley rats were centrifuged at 3.6 and 4.7 *g*. Liver slices of these rats were incubated with C^{14}-labeled acetate and its incorporation into fatty acids, nonsaponifiable lipids, and CO_2 was measured. When compared with tissue from control rats, liver slices of centrifuged rats exposed to 4.7 *g* showed an increased formation of C^{14}-nonsaponifiable lipids. Comparable changes were not observed in rats exposed to 3.6 *g*. No significant alteration was noted for incorporation of acetate into fatty acids or CO_2. The total lipid content of the liver was decreased significantly in rats exposed to 4.7 *g*. The response evoked from long-term exposure affected synthesis of nonsaponifiable lipids whereas short-term exposure affected fatty acid synthesis.

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Received March 11, 1965. P.S.E.B.M., 1965, v119.

Survival of *Plasmodium gallinaceum* Sporozoites in Previously-Excised Skin of Mouse and Chick.* (30227)

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The familiar barnyard fowl is highly susceptible to infection with *Plasmodium gallinaceum* and the laboratory albino mouse is absolutely resistant. Having previously shown (1) that when *Aedes aegypti* mosquitoes introduce the sporozoites of this organism into the skin of the mouse there is an almost im-

* Supported by grant from Nat. Inst. Health.

TABLE I. *P. gallinaceum* Infections After Intraperitoneal Implantation of Bitten Excised Skin.

	Chick skin	Ratio	Mouse skin	Ratio
Immediate implantations	38	3.8	37	37.0
Resulting infections	10	1	1	1
Implantations after 1 hr incubation	42	3.0	43	
Resulting infections	14	1	0	

mediate inhibitory action occurring at the site so that the skin is not infectious when implanted intraperitoneally in a clean chick, I shall now present evidence that this inhibitory action remains operative in a piece of skin that has been excised before being submitted to the potentially infecting bite of the mosquito.

Methods. An albino mouse of about one month of age is killed by a sharp blow to the head, and a small piece of the belly skin, from which the hair has been removed with clippers, is quickly excised and stretched over the large end of an eye-dropper from which the bulb has been removed, the outside of the skin being the part that remains exposed. This drum-head of skin is then set over a small hole in the top of a nylon chiffon-covered bottle containing 20 infected mosquitoes that have not previously fed since their infecting meal was taken, in such manner that probing into the skin may take place easily. After an exposure period of 5 minutes, the skin is removed and either implanted intraperitoneally at once in a clean chick or else incubated for one hour at 38°C before implanting. During the period of incubation it is kept under cover in a humid Petri dish, much as one treats a fresh blood smear when studying gametocyte exflagellation. As control the same procedures are followed with excised chick skin. From the 7th through the 21st day the blood of the implanted chick is studied for evidence of infection. It is not possible, of course, to determine with certainty which mosquitoes actually introduce sporozoites, because no blood appears in their bodies to permit the identification, but careful watching has revealed that at least 6 avidly probe simultaneously at some moment in each instance. Actually, it is probable that even more probings than this take place because one has no way of knowing that a newly lighting mosquito is not one that has previously probed and flown away. It appears that satisfaction rather than frustration results from these probings because individual mosquitoes frequently remain motionlessly in contact after the movement of insertion, although they apparently have no difficulty in detaching at will.

Results. It will be seen in Table I that of the 38 clean chicks implanted with excised *chick* skin immediately after it had been bitten by infected mosquitoes, 10 developed infection (a ratio of potential to actual infections of 3.8 to 1). Of the 42 implanted after the bitten skin had been incubated for one hour, 14 became infected (a ratio of potential to actual infections of 3 to 1). In the case of the 37 chicks implanted immediately with excised *mouse* skin that had been similarly bitten by infected mosquitoes, one became infected (a ratio of 37 to 1), whereas of the 43 implanted after the bitten skin had incubated for one hour, none became infected. The total figures, therefore, are 24 infections for the 80 implantations of bitten chick skin, and one infection for the 80 implantations of bitten mouse skin; *i.e.,* 24 chick skin infections occurred for one mouse skin infection.

Discussion. The definitive finding here is that something happens to the sporozoite when introduced by the mosquito into the skin of a mouse that does not happen when the introduction is into the skin of a chick. Of course the action may not be precisely against the sporozoite, for Huff and Coulston(2) have shown that metamorphosis into the next stage of the plasmodium's life cycle takes place very quickly once the sporozoite has been deposited in the skin. But infectiousness, whether the deposited organism be still in the sporozoite stage or already in the

early cryptozoite stage, is quickly lost in mouse skin and retained for a considerable period in chick skin. It seems unlikely that in the present experiments the inactivation would be in the nature of either an inflammatory or an immune reaction against the introduced foreign protein, for this skin had already been separated from its blood supply, and presumably therefore from all reactive responses of a chemotactic, immunologic or hormonal nature, for some minutes before introduction of the sporozoites occurred. It is tempting to consider tentatively that the failure of the mouse to become infected when the sporozoite of *P. gallinaceum* is introduced into its skin by the bite of the infected mosquito is due to either (a) the presence in the skin of a toxic anti-metabolite, or (b) the absence of a metabolite that is essential for the progressive existence of the introduced organism. Studies are under way in the attempt to elucidate these points.

Summary. When *Aedes aegypti* mosquitoes infected with *Plasmodium gallinaceum* were allowed to deposit the sporozoites of this organism while probing into the excised skin of the chick and the mouse, the infections resulting from the intraperitoneal implantations into clean chicks of these probed pieces of skin were in the ratio of 24 from the chick skin to one from the mouse skin. It appears that there is something deleterious to the survival of the introduced plasmodium in the skin of the mouse that is not dependent upon its living state.

Grateful acknowledgement is made of the technical assistance of Esther Nadolny.

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Received March 16, 1965. P.S.E.B.M., 1965, v119.

Ovarian Histology After Treatment of Rats with Norethynodrel.* (30228)

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Earlier microscopic studies(1,2,3) of the ovary after treatment of rats with 17α-ethinyl-17-hydroxy-$\Delta^{5(10)}$-estren-3-one (norethynodrel) revealed that corpora lutea are reduced in number or totally absent in some cases(1,2). Follicles are fewer, although some are cystic and larger than normal(1). Ovarian weight is reduced if treatment with norethynodrel is sufficiently prolonged. This report will present evidence that norethynodrel (a) stimulates the corpora lutea through mediation of pituitary secretion of luteotropin (prolactin) and (b) may cause involution of the interstitial tissue.

Methods. Young, adult female rats of the Sprague-Dawley strain were used. Their initial weight was 170-190 g. Norethynodrel was suspended in a medium consisting of Upjohn sterile vehicle 98 (carboxymethylcellulose, polysorbate and polyparaben) diluted 1:2 with 0.9% NaCl. The compound was injected subcutaneously in divided doses twice daily except in experiments involving hypophysectomized animals, when injections were made once daily. All control animals received an amount of vehicle equal to that given to norethynodrel-treated rats.

All rats were killed 24 hours after the last injection. The ovaries were removed while the rats were under sodium amytal anesthesia. After being weighed, the ovaries were fixed in either Bouin's fluid or 10% formalin combined 9:1 with 0.2 M phosphate buffer at pH 7.0. Sections of the formalin-fixed glands were stained with oil red O and hematoxylin. In some experiments other sections were stained by the Schultz(4) reaction for

* This investigation was supported in part by grants from U.S.P.H.S. (Am-00131-13 and AM-06918-02) and from Upjohn Co.