lipids may be the result of similar bacterial action within the appendix. Further information about the nature and fate of lipids secreted into the bowel should help to determine the reasons for the characteristic and relatively constant lipid pattern of the fecalith.

Summary. The relative proportions of palmitic, stearic, oleic, and linoleic acids in lipids extracted from fecaliths and feces are compared by means of gas-liquid chromatography. Fecaliths, in contrast to feces, contain little oleic acid and no apparent linoleic acid. Thin-layer chromatography was used to determine the types of lipids found in fecaliths and feces. The former contain less triglyceride and more free fatty acids than the latter. Fatty acid soaps were not found in fecaliths.

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Electrocardiogram in Hamsters after Large Fat Meals.* (26053)

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It has been shown in hamsters that the red blood cells aggregate and the circulation slows after large fat meals(1,2). Availability of oxygen in cerebral tissues is also significantly decreased(3) and convulsions occur(4) after meals of fat. These changes are either absent or much less marked after meals of oil. This paper reports changes in the electrocardiograms which also occur after fat, but not after oil meals.

Material and methods. Hamsters weighing from 80 to 120 g were tube fed butterfat as cream, or oil and synthetic fat mixtures emulsified in skim milk under very light ether anesthesia. Amounts of the lipid meals varied from 1.6 to 10.0 g/kg body weight. The volume of each feeding was the same, 3 ml/100 g body weight; concentration of the lipid in the meals varied. Standard 3 lead electrocardiograms were determined 0, 3, 6, 9, 24, 48, and 72 hours after each feeding. The animals were restrained by leg ties for recording of the E.K.G.s. E.K.G. potentials were amplified by a Tektronic polygraph and recorded by an Offner dynograph.

Results. The electrocardiographic changes after fat meals consisted of elongation of QT and ST intervals. The QT interval was measured from the beginning of the QRS complex to the end of the T wave (where the T wave returns to the isoelectric line). The ST segment was measured from the end of the QRS complex to the beginning rise of the T wave. In 55 animals before lipid feeding RR, QT, and ST intervals were measured in the stand-

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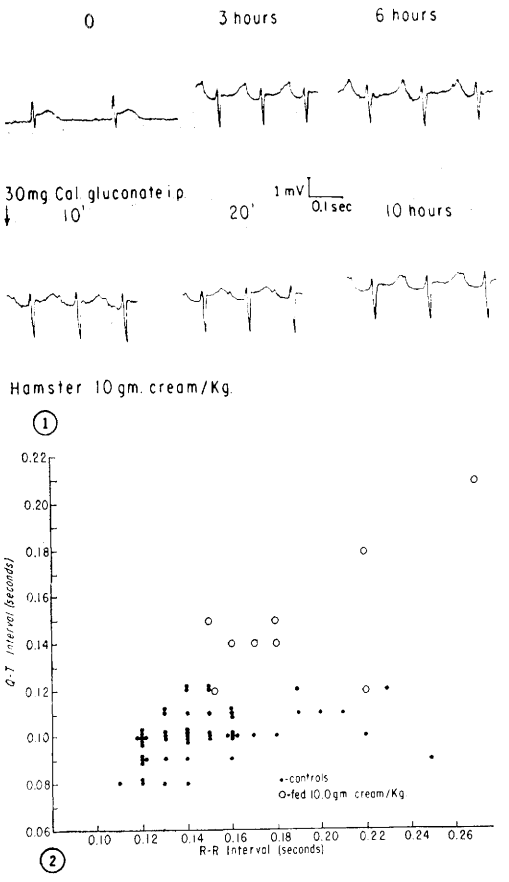

FIG. 1. Electrocardiogram of hamster after cream meal of 10 g butterfat/kg body wt showing elongation of QT interval and ST segment, and changes produced by inj. of calcium.

FIG. 2. Relationship of QT interval to RR interval in 55 non-fat fed animals, and in 9 cream fat fed animals. Only the one longest QT interval in each animal experiment was recorded after fat feeding.

ard 2 lead. In all 55, ST intervals were too short to be measured, or were non-existent depending upon the shape of the QRS complex. The QT interval varied from 0.08 to 0.12 seconds with a tendency for the QT interval to vary directly with length of the RR interval up to a RR interval of about 0.15 seconds. Further increase in RR interval did not increase the QT interval in normal animals (Fig. 2).

After feeding 4 g cream fat/kg body weight the QT interval did not exceed the normal limit of 0.12 seconds in any one of 9 animals up to 72 hours, and the ST segment was still too short to be measured. After feedings of cod liver oil (10.0 g/kg in 4 animals), olive oil (8 g/kg in 6 animals), safflower oil (8 g/kg in 6 animals), and hydrogenated safflower oil with iodine number of 99 (8 g/kg in 6 animals) no abnormally long QT or ST intervals were found when similarly measured.

After feeding of 8 g of cream fat/kg body weight, QT interval in 2 of the 8 animals was prolonged up to 0.14 and 0.17 seconds 3 to 9 hours after feeding. The ST segment was prolonged in 7 of the 8 hamsters to from 0.01 to 0.08 seconds (Fig. 1). After 10 g cream fat/kg the QT interval was prolonged in 7 of 9 animals (Fig. 2), and ST segment was prolonged to from 0.02 to 0.1 seconds in all animals. Prolongation of ST segments was evident 3 hours after feeding in all animals. Three hours later the QT interval was measurably elongated. Elongation of these intervals continued for from 3 to 9 hours in most animals, and for 72 hours in one animal. Six animals were fed a synthetic formula containing olive oil 30%, tributyrin 10%, and tricaprin 60% in 8 g/kg doses. This formula has been shown to produce frequent convulsions in hamsters(5). In one animal the QT interval was prolonged and in 2 others the ST interval was prolonged. In all instances the changes in QT interval were similar to those described by Kleinfeld and Gross(6) in rabbits after injections of EDTA.

Injections of 30 mg of calcium gluconate into 5 animals with prolonged QT intervals shortened the interval to or near to normal for several hours in 4 of 5 animals (Fig. 1). The ST segment was altered similarly in the same 4 animals. Injections of 10 g potassium chloride in fat fed animals altered the amplitude and/or form of the QRS complex and T wave without shortening the QT or ST segments in 2 of 3 animals.

Discussion. From other studies(3,5) it is evident that the incidence and magnitude of the changes in QT and ST interval varies directly with decreases in available oxygen in the tissues. It seems unlikely, however, that hypoxia alone is the cause of the QT and ST changes, since these intervals were rather quickly returned nearly to, or to normal by injections of calcium gluconate. It seems more likely that the metabolism of large

amounts of lipid contributed to the E.K.G. changes by binding the freely available calcium. The possibility exists that the cations in the tisues and blood were utilized to neutralize the free fatty acids liberated by hydrolysis of neutral fats.

We have shown that convulsions occur in hamsters after fat meals, but not after similarly sized meals of highly unsaturated oils such as cod liver oil and safflower oil(4,5). The mechanisms of the seizures is not known, but is thought to be related to alterations in the circulation(1,2) and reduction in availability of oxygen in the brain(3) which occur after fat feedings. It is postulated that the permeability of brain capillaries is increased and free fatty acids, normally excluded from the brain, pass the blood-brain barrier in toxic or irritant amounts. No direct relationship can at present be established between the mechanisms of the seizures and E.K.G. changes. The fact that the changes noted above occur after fat meals and not after oil meals indicate that the metabolism of saturated fatty acids is significantly different, quantitatively or qualitatively, from the metabolism of unsaturated fatty acids.

Summary. Large cream and oil meals were fed to hamsters. At intervals after feeding electrocardiograms were made. After the fat meals prolongation of the QT interval, especially its ST segment occurred. These changes were absent after oil meals.

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Gonadotrophin Inhibiting and Anti-Fecundity Effects of Chloramiphene.* (26054)

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Modification of the chemical structure of chlorotrianisene (TACE®)(1) has led to a varied spectrum of biological activities. The specific biological effects produced by these modified substances are: (a) inhibition of cholesterol synthesis by triparanol (MER/29®)(2), and (b) estrogen antagonism by ethamoxytriphetol (MER-25)(3). The present paper pertains to a new structurally related compound, chloramiphene (1-[*p*-*β*-diethylaminoethoxy) phenyl] -1,2-diphenyl-2-chloroethylene).‖ Its major biological activity refers to pituitary gonadotrophin inhibition and anti-fecundity.

Materials and methods. Chloramiphene was tested as the citrate salt. It was administered in suspension in an olive oil vehicle unless otherwise indicated. Control animals received the vehicle alone. Rats utilized were of Sprague-Dawley strain, and were given tap water and stock laboratory diet (Rockland) *ad libitum. Pituitary gonadotrophin inhibition. Intact immature male rats.* Rats of approximately 70 g were divided into groups of 5 and were given chloramiphene in doses ranging from 0.3 to 70.0 mg/kg/day, by once

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‖ One of a series of structurally related compounds, synthesized by Allen, R. E., Feil, V. J., and Palopoli, F. P.