ization, and it is concluded that the calcite is primary rather than secondary. No evidence was found that supported Bøggild's suggestion of the presence of calcitic layers in the outer shell, but sampling is, of course, quite inadequate to prove or disprove his contention. A goniatite, *Gastrioceras elkhornense,* was also tested and found to be composed of aragonite.

It is hoped that further study of this material will permit determination of the skeletal mineralogy of additional forms and the discovery of the microarchitectural characteristics of many groups. Preliminary tests of oxygen from the carbonate of some of these shells suggest that they will be suitable for O^{18}/O^{16} paleotemperature studies. It may be possible, therefore, to learn much of the temperature requirements and modes of growth of long-extinct forms.

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Radiation-Induced Fecal Fat Formation in the Rat

Studies on the effect of radiation on fecal fat thus far have not clearly distinguished between the effects of the radiation and the induced anorexia (*1*). Increases in fecal fat that were noted in human patients by Dodds and Webster (*2*), following x-ray therapy, were attributed to impaired lipid absorption induced by irradiation. Mead and coworkers (*3*), maintaining irradiated mice on fat-free diets, showed elevated fecal fats. These authors state that this fecal-fat increase was due to intestinal desquamation resulting from radiation injury. In contrast, Coniglio *et al.* (*4*), through fat-balance studies, have noted decreased fecal-fat after irradiation but have correlated such changes to the lessening of food intake during this period. To eliminate variation in fat excretion resulting from food intake, the studies reported here have dealt with fasted normal and irradiated rats. Further, since fecal lipid appears to be secreted by the intestinal wall (*5*), lipogenesis has been studied in two groups of animals by intraperitoneal injections of acetate-1-C^{14} (0.1 μc) prior to the fecal collection period.

Table 1. Fecal fat in normal and irradiated rats.

No. of animals	No. of determinations	Dose (r)	Fecal fat (mg/g)	Specific activity (count/min mg)*	Total counts (count/min g)
64	31	0	56.4	1.3	75
34	17	1000	60.2		
39	21	1500	82.7	3.5	348

* Acetate-1-C^{14} was administered to 16 normal and seven irradiated animals. Specific activity and total count refer only to these animals.

Female albino rats weighing 175 ± 15 g were given 1000- or 1500-r doses and fasted 48 hours while they were being kept in metabolic cages. The feces during this period were collected, pooled from two animals, and dried in a vacuum. Aliquots of fecal material were ground, and the total lipid was extracted. This latter process involved two incubations at 40°C with an alcohol-ether mixture (3:1) followed by a 12-hour ethyl ether Soxhlet extraction. The isolated lipids containing carbon-14 were analyzed by means of a nuclear-flow counter using a Berkeley scaler.

Fecal-fat excretion, as can be seen in Table 1, shows significant elevation with roentgen dose. Thus the feces from normal animals averaged a fat content of 56.4 mg/g and increased to 82.7 mg/g when a 1500-r dose had been administered. If taken separately, similar comparisons can be made in the groups injected with acetate-C^{14} and the noninjected groups. Here, irradiated animals receiving acetate showed a fecal-fat average of 99.0 mg/g as compared with 58.5 mg in the normals, while those receiving no acetate exhibited 79.2 and 55.2 mg/g under the same respective treatment.

Comparisons of lipogenesis have been made by noting the total counts found in the fecal fat from irradiated and nonirradiated animals. Such comparisons clearly show that the treated rats incorporated into the fecal lipids more than 4 times as much acetate-C^{14} as did the controls. In addition, the increase in specific activity from 1.3 in the controls to 3.5 in the irradiated animals would also be indicative of a stimulation in the fecal-fat synthesis.

Further studies to demonstrate the similarity in composition of the fecal fats from both groups were carried out by fractionating the isolated material into free fatty acids and mono-, di-, and triglycerides. This technique, as outlined by Mattson and Beck (*6*) showed that the lipid samples contained, on the average, 41 percent free fatty acids, 20 percent monoglycerides, and 39 percent di- and triglycerides from both normal and x-rayed animals. Since increased lipogenesis has been demonstrated, the possibility seems more likely that this fat originates from intestinal secretion rather than from sloughed-off mucosa as postulated by Mead (*3*). As further evidence for this view, fecal fat that was fractionated after administration of acetate-C^{14} showed that approximately 50 percent of the total count was in the free fatty acids and monoglycerides, with the remaining 50 percent in the di- and triglycerides in both irradiated and control animals.

Thus, the indications are that lipid of similar composition is being formed by both types of rats varying only in the rate of formation. An attempt to gain further evidence to support this concept by the administration of acetate-1-C^{14} and the analyses of the material isolated from the lumen of the small intestine in normal and irradiated rats is being contemplated.

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Precipitation of Enzymes during Isolation of Chloroplasts in Carbowax

Two major difficulties in the determination of the intracellular distribution of enzymes are (i) the adsorption of soluble enzymes on particulate matter and (ii) the leaching of enzymes from the particles during the isolation procedures. It has been suggested that leach-