enic acid followed from the assignment of its 3 oxygen atoms to an α,β-unsaturated ketone and a carboxylic acid group. A sample recrystallized from ethyl acetate for analysis melted at 244°–246° (totally immersed Anschutz thermometer; literature mp, variously 236°–262°). Calculated for $C_{20}H_{28}O_3$: C, 75.91; H, 8.92. Found: C, 76.01, 75.90; H, 8.99, 8.90. $[\alpha]^{27}_D + 156°$ (chloroform). Ultraviolet absorption maximum at 241 mμ (log ε 4.21). No depression of melting point was observed when this product was mixed with an authentic sample.

That 3-keto-4-etiocholenic acid was a true transformation product of DOC and not merely a normal constituent of the liver or the blood was concluded from the quantity of this product that was isolated. Thus, from the perfusion of 10.2 g of DOC a total of 3.1 g of crude, crystalline steroids was isolated. By direct chromatography and by extraction of the DOC-rich eluate residues with potassium bicarbonate solution, 340 mg of reasonably pure (minimum mp, 236°) etio acid was obtained. Therefore the conversion was 3.3%, the yield was 4.6%, and the etio acid represented 11% of the recovered crystalline steroids.

Evidence is lacking to demonstrate whether the relatively low recovery of crystalline steroids is due to more extensive degradation of DOC or to inadequacies in the isolation procedure, although indications are that both these factors are important. Total steroid recoveries from nonperfused blood samples treated by the same technique are known to average about 60%. The fate of a glucuronide in our procedure is not known, although it is quite possible that it would not be adsorbed from the perfusate and would be lost. Various amorphous fractions from chromatography are undergoing further investigation.

Turfitt (*15*) has shown that soil bacteria of the genus *Proactinomyces* oxidize cholesterol (via cholestenone) to 3-keto-4-etiocholenic acid. However, the formation of this etio acid by liver perfusion of DOC is considered remarkable, since the commonly recognized transformation to pregnanediol involves reduction at both the unsaturated ketone grouping and the side chain, whereas the formation of the etio acid is an oxidative change. There is, of course, the possibility that the perfused liver in our experiments had available a larger supply of oxygen than the liver in an intact animal.

Precedence for the degradative bio-oxidation of a steroid side chain by mammals can be found in the oxidation of cholesterol to the bile acid stage (*16*) and in the presence of radioactive carbon dioxide in expired air after intraperitoneal injection of radioprogesterone labeled at C_{21} (*17*).

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The Aerial Transport of Mammalian Ova for Transplantation

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Since Heape (*1*) succeeded in transferring fertilized ova from one rabbit to another, Pincus (*2*) has employed the technique to determine the possibility of fertilization *in vitro* and parthogenesis of rabbit ova. Chang (*3*) has been able to store *in vitro* at 10° C fertilized rabbit ova in the early stages and in the late blastocyst stage. The possible practical application of such transplantation techniques in agriculture and medicine has aroused interest in recent years. This note reports the first successful aerial shipment of fertilized rabbit ova for transplantation from one country to another.

Two Californian rabbits were superovulated and inseminated with the semen of a Californian buck at the Worcester Foundation for Experimental Biology. About 24 hr after insemination they were sacrificed and the Fallopian tubes were flushed with whole rabbit serum. Altogether, 74 fertilized ova at the 2-cell stage were recovered and placed in 4 small flasks (1 ml capacity) containing whole serum, with a drop of penicillin solution added. The flasks were packed in a small thermos flask containing 2 small ice balloons. The thermos was shipped from Boston by air to London and then by train to Cambridge.

The time interval from recovery of the ova to the time of transplantation was 27 hr, and the temperature in the thermos was 12° C at the time of packing and 19° C at the time of unpacking.

Three black does kept in the School of Agriculture at Cambridge University were intravenously injected with Prolan and two of them were successfully bred by a colored vasectomized buck to induce ovulation about 26 hr before transplantation. Midline incision was made on the recipients, and 5 segmented ova were placed into the ampulla of each Fallopian tube. Ex-

[1] We are indebted to J. Hammond and G. Pincus, and to J. D. Silveria, of Trans World Airlines, for providing facilities for this experiment.

amination of the ovaries, however, revealed that one recipient failed to ovulate. On the 32nd day after transplantation, 2 Californian offspring were produced by one recipient rabbit (Fig. 1). The percent-

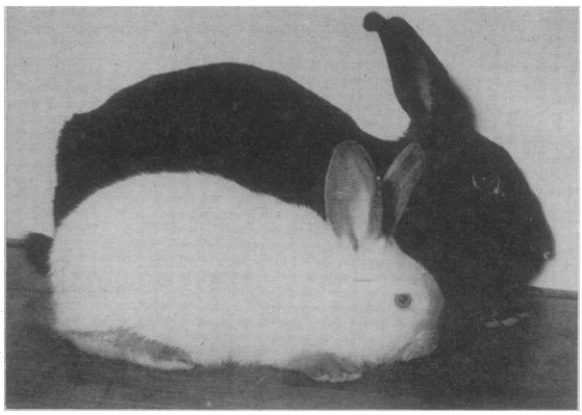

FIG. 1. Recipient English black doe with white Californian young.

age of normal development in these two cases is rather low—10%—when compared with ova stored at 10° C for 24 hr—37% (*3*).

The temperature in a thermos flask containing ice balloons, as determined in the laboratory, drops from 15° C to 2°–5° C within 1–2 hr, stays at 2°–6° C for about 10 hr, and then gradually rises to 25° C in 4–6 hr. From previous experiments (*4*), it is known that the normal frequency of development is rather low (6–24%) when the rabbit ova are stored either at 0°–5° C or at 15° C. The low percentage of development in the present experiment is perhaps due mainly to the variation of temperature at the time of shipping.

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Identification and Lead-Uranium Ages of Massive Uraninites from the Shinarump Conglomerate, Utah[1]

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During field work in southeastern Utah in July and August 1951, two samples of hard, massive uraninite were found in the Shinarump conglomerate of Triassic age. To our knowledge, the occurrence of pure, massive uraninite on the Colorado Plateau or in the Shinarump conglomerate has not been previously reported, although sooty uraninite from the Happy Jack Mine in San Juan County, Utah, has been described by Kerr (*1*) and others. These massive uraninites were collected in the course of an investigation of the origin of the carnotite deposits of the Colorado Plateau undertaken by the U. S. Geological Survey on behalf of the U. S. Atomic Energy Commission.

The authors have been studying the isotopic composition of the lead extracted from approximately 50 samples of uranium ore collected at different geographic localities and stratigraphic positions on the Colorado Plateau and are computing the ages from the Pb^{206}/U^{238}, Pb^{207}/U^{235}, and Pb^{207}/Pb^{206} ratios. The average apparent Pb^{206}/U^{238} age of all samples studied containing more than 0.1% uranium is 77.3 million years.

TABLE 1

SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSES OF URANINITE SAMPLES
(Analysts, Charles Annell and C. L. Waring, U. S. Geological Survey)

Locality	Percentages*			
	Over 10	10–1.0	1.0–0.1	0.1–0.01
Happy Jack Mine†	U	—	Ca Pb Fe Al Si	Cu Y Zn V Ba Mn Sr
Happy Jack Mine‡	U	—	Ca Pb Fe Al Si	Cu Y Zn V Ba Mn Sr
Shinarump No. 1 claim†	U	—	Ca Pb Fe Al Si Co Ba Ni Mn	V Y Zn Sr
Shinarump No. 1 claim‡	U	Ba Si Pb	Ca Fe Al Co Sr Zn Ni	V Y Mn Ti

* Th and Ce, with sensitivity limits of 0.1%, were not detected on the spectrogram.
† Hand-picked fragments of nearly pure uraninite.
‡ Large samples, chemically analyzed.

One sample of massive uraninite is from the Happy Jack Mine, White Canyon, San Juan County, Utah. It was obtained from a nearly horizontal tabular or lenslike mass of uraninite that ranges in thickness from 1/16″ to ¾″ and is approximately 1½′ in the exposed long dimension. Sandstone containing finely disseminated uraninite and impregnated or veined with pyrite, chalcocite (?), covellite, and chalcopyrite surrounds the small tabular mass of uraninite. The specimen was collected near the foot of a working face at the end of a short drift approximately 200′ from the main portal. The thickness of the conglomerate and sandstone at this portal is about 20′ (*2*).

The other sample of massive uraninite is from the Shinarump No. 1 claim, Seven Mile Canyon, Grand County, Utah. It was collected from a pillar at the portal of the prospect. This uraninite occurs as a replacement of woody material. There are also disseminated uraninite, pyrite, and secondary uranium minerals in the surrounding sandstone.

[1] Publication authorized by the director, U. S. Geological Survey.