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.

The specific gravity of carefully selected uraninite fragments was measured as 9.1 for the specimen from the Happy Jack Mine and 8.6 for the specimen from the Shinarump No. 1 claim. These carefully picked fragments, when studied by x-ray powder diffraction methods by E. A. Cisney, of the U. S. Geological Survey, gave face-centered cubic patterns (unit cell size of 5.43 ± 0.02 A) that are identical with those of uraninite.

The results of semiquantitative spectrographic analyses of both the fragments used for specific gravity determinations and the larger samples of uraninite that were analyzed chemically are given in Table 1.

The uraninites were analyzed volumetrically for uranium by the cupferron method and colorimetrically for lead by the dithizone method (Table 2). Of the

TABLE 2

PRELIMINARY QUANTITATIVE CHEMICAL ANALYSES OF URANINITE FOR URANIUM, THORIUM, AND LEAD

Locality	U (%)*	Th (%)*	Pb (%)†
Happy Jack Mine	73.46	< 0.01	0.74
Shinarump No. 1 claim	55.90	< 0.01	1.43

* Analyst, Harry Levine, U. S. Geological Survey.
† Analyst, Robert Milkey, U. S. Geological Survey.

14 analyses of uraninite published in *The System of Mineralogy* (*3*), only four specimens contain more uranium than the Happy Jack uraninite and only two contain less total lead. The high uranium content of the Happy Jack uraninite is due not only to the purity of the specimen but also to the relatively small amounts of radiogenic Pb^{206} and Pb^{207} in the sample.

Lead was extracted from the large samples of uraninite and, after purification, precipitated as the iodide. The iodide was submitted for mass spectrographic analyses to Roger F. Hibbs at the Carbide and Carbon Chemicals Co., Y-12 Plant, Mass Assay Laboratory, Oak Ridge, Tenn. The percentage abundance of the lead isotopes is given in Table 3, together with a published analysis of common lead from the Tucson Mountains, Ariz.

Lead is deposited in many radioactive minerals at the time of their formation. The isotopic composition of the common lead so deposited should be known in order that the correction can be made for the amount of Pb^{206}, Pb^{207}, and Pb^{208} not produced by radioactive decay in the mineral. As Pb^{204} is not known to be the end product of any radioactive decay series, the percentage abundance of this isotope in the analyses was used as an index of the common lead present. Tentative corrections for the common lead in the uraninites have been made, using Nier's analysis (*4*) for the isotopic composition of the lead in wulfenite and vanadinite from the Tucson Mountains (Table 3). This common lead was chosen because it has been contaminated with slightly less radiogenic Pb^{206} and Pb^{207} than the six Colorado Plateau common leads that we have studied. The use of a vanadinite type of lead, therefore, will give slightly higher Pb^{206}/U^{238} ages than the use of any of the Plateau common leads. The tentative percentage of common lead present in uraninites from the Happy Jack Mine and the Shinarump No. 1 claim is 10.51 and 60.37, respectively. Final corrections for common lead in the Happy Jack uraninite will be made as soon as the isotopic analysis of a galena sample collected from the Happy Jack Mine has been completed.

TABLE 3

ATOM PERCENTAGE ABUNDANCE OF LEAD ISOTOPES

Locality	Percentage abundance			
	Pb^{204}	Pb^{206}	Pb^{207}	Pb^{208}
Happy Jack Mine	0.15	88.15	6.43	5.27
Shinarump No. 1 claim	0.84	53.55	14.73	30.88
Tucson Mountains, Ariz.*	1.37	25.20	21.27	52.17

* Wulfenite and vanadinite analyzed by Nier (*4*).

Table 4 shows the tentative percentage abundance of the radiogenic Pb^{206} and Pb^{207} and the amount of these two leads in the two uraninites.

TABLE 4

CALCULATED PERCENTAGE ABUNDANCE AND CALCULATED GRAMS OF RADIOGENIC LEAD PER GRAM OF SAMPLE

Locality	Percentage abundance radiogenic		Grams of radiogenic	
	Pb^{206}	Pb^{207}	Pb^{206}	Pb^{207}
			Per g sample	Per g sample
Happy Jack Mine	85.39	4.10	0.0063	0.00030
Shinarump No. 1 claim	38.01	1.62	0.0054	0.00023

The Pb^{206}/U^{238} ages given in Table 5 were computed using Wickman's nomograph (*5*). The Pb^{207}/U^{235} ages were calculated from the radioactive decay formula. The Pb^{207}/U^{235} ages, particularly for the Shinarump No. 1 uraninite, are less reliable because the corrections introduced by the assumed isotopic composition of the common lead have a proportionally greater effect on the Pb^{207}/U^{235} age calculations in

TABLE 5

Pb^{206}/U^{238} AND Pb^{207}/U^{235} RATIOS AND THEIR CALCULATED AGES
(To the nearest 5 million years)

Locality	$\frac{Pb^{206}}{U^{238}}$	$\frac{Pb^{207}}{U^{235}}$	Age in million years calculated from	
			$\frac{Pb^{206}}{U^{238}}$	$\frac{Pb^{207}}{U^{235}}$
Happy Jack Mine	0.00866	0.0581	65	65
Shinarump No. 1 claim	0.00980	0.0584	75	65

samples that are contaminated with large amounts of common lead. The Pb^{207}/Pb^{206} ages are not presented at this time because this age calculation is even more sensitive to common lead corrections than the Pb^{207}/U^{235} ages.

As shown in Table 6, the calculated ages of the

TABLE 6

Pb^{206}/U^{238} AGE OF URANINITES FROM THE COLORADO FRONT RANGE AND FROM THE COLORADO PLATEAU

Locality	Pb^{206}/U^{238} age in million years*
Wood Mine, Gilpin Co., Colo. (*6*)	57.3
Wood Mine, Gilpin Co., Colo.†	60
Gilpin Co., Colo. (*6*)	59.8
Iron Mine, Gilpin Co., Colo.‡	70
Happy Jack Mine, San Juan Co., Utah	65
Shinarump No. 1 claim, Grand Co., Utah	75

* These ages have been corrected for common lead, using the isotopic composition of the lead in the wulfenite and vanadinite (*4*).

† Specimen from the U. S. National Museum (USNM 83629), courtesy George Switzer. Analyzed chemically by U. S. Geological Survey. Isotopic analysis by Carbide and Carbon Chemicals Co., Y-12 Plant, Mass Assay Laboratory, Oak Ridge, Tenn. Age expressed to nearest 5 million years.

‡ Specimen collected by George Phair, U. S. Geological Survey. Analyzed chemically by U. S. Geological Survey. Isotopic analysis by Carbide and Carbon Chemicals Co., Y-12 Plant, Mass Assay Laboratory, Oak Ridge, Tenn. Age expressed to nearest 5 million years.

uraninites from the Shinarump conglomerate of Utah are of the same order of magnitude as the early Tertiary age of uraninites of the Colorado Front Range. However, using the geologic time scale proposed by Holmes (*6*), the Shinarump conglomerate is estimated to be approximately 160 million years old.

If the ages calculated from the foregoing data for the uraninites in the Shinarump conglomerate, and the average age (77.3 million years) for the carnotite deposits of the Salt Wash sandstone member of the Morrison formation (Upper Jurassic), are close to the true ages of these ores, then these uranium-bearing minerals were probably formed in the sediments in late Mesozoic or early Tertiary time. This interpretation differs markedly from the earlier conclusions, based on field evidence, by Hess (*7*), Webber (*8*), and Fischer (*9*), that the uranium minerals were introduced into the sandstones of the Colorado Plateau during or soon after deposition of the sandstones. Careful study is continuing in order to resolve the uncertainties in interpretation of both field and laboratory data so that a satisfactory hypothesis of origin of these ores may be established.

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The Isolation of Progesterone from Human Placentae[1]

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Progestational activity has been detected by biological methods in the placenta (*1*), the urine (*2*), and the blood (*3*) of pregnant women and also in the blood of nonpregnant women (*4*). Attempts to isolate progesterone from human tissues, however, have hitherto been unsuccessful (*5–8*).

We are reporting the isolation of progesterone from normal postpartum placentae. Since the greatest yield yet reported has been obtained by treatment of whale corpora lutea with diute NaOH, we have utilized this procedure (*9*). Two characteristics served as guides in the isolation: first, progestational activity as measured by the Hooker-Forbes microassay technique (*10*); second, the unsaturated α-β structure in Ring A, as determined by its absorption maximum at 240 μ. It was later found that all fractions that showed more than traces of progestational activity also demonstrated an absorption maximum at 240 μ. Other minor fractions had peaks at this wavelength but did not exhibit significant progestational activity.

Placentae were frozen in the deep-freeze and finely ground before being completely thawed. The tissue was then treated with approximately equal volumes of 5% NaOH for two days at room temperature. The resulting liquid was extracted five times with equal volumes of redistilled ether, back-washed with water until neutral, and then evaporated to dryness. Approximately 3 mg of neutral lipids was obtained from each gram of crude tissue.

Ketones were separated from the neutral ether extract by means of Girard's Reagent T (*11*). Preliminary chromatography on Magnesol: Celite (ratio 5:1) was followed by fractional chromatography on activated alumina (Merck) and Hyflow Supercel, using, for elution, mixtures of hexane, benzene, or alcohol in various proportions. In the final stages, the

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