TABLE 2

5-Min period	Subject					
	3		6			
	+	−	+	−	+	−
1	170	54	95	50	68	13
2	187	82	62	3	109	30
3	206	54	51	1	102	32
4	160	43	88	47	84	2
5	167	7	87	25	117	2
6	158	12	79	40	79	0
Total	1048	252			1021	245

ing pigeons can discriminate among planes of polarized light. It is evident, however, that they can form a simple brightness discrimination very rapidly. Hence, it is concluded (*a*) that if homing pigeons can discriminate at all among patterns of polarized light, they can do so only with extreme difficulty, and (*b*) that it is highly unlikely that homing pigeons make use of patterns of polarized sky light as cues in their homing flights.

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Extraction of Adrenal Cortex Hormone Activity from Placental Tissue

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Several kinds of mammalian tissue have been examined in our laboratories in an effort to find sources of naturally occurring adrenal cortex hormones other than adrenal tissue itself. As a result of such studies, evidence has been obtained for the existence of this type of biological activity in human and equine placental tissue.

The investigation of the adrenal hormone content of human placentas[2] was initiated in conjunction with our preparation of crude placental extracts for studies by William H. Pearlman, of the Jefferson Medical College. A report on the latter work has recently appeared (*1*). In subsequent experiments, the placentas were collected at a local hospital, frozen quickly in solid CO_2, and processed by a standard procedure for isolating adrenal cortex hormones (*2, 3*). The resulting "neutral hormone concentrates" were anaylzed for their content of adrenal cortex hormone activity.[3]

[1] We wish to acknowledge the helpful interest shown in this work by M. H. Kuizenga.

[2] We are indebted to Richard H. Barnes, of Sharp & Dohme, Glenolden, Pa., for the human placentas used in the preliminary investigation.

[3] We are indebted to K. J. Olson, R. O. Stafford, and D. F. Kiel for the bio-assay data reported in this paper.

Two different methods of bio-assay were employed: the rat liver glycogen deposition test (*4*) and the rat survival growth test (*5*). The resulting data are presented in Table 1.

TABLE 1

ADRENAL CORTEX HORMONE CONTENT OF EXTRACTS OF HUMAN PLACENTAL TISSUE

Lot No.	Bio-assay procedure			
	Glycogen deposition* (u/kg tissue)	No. rats	Survival growth† (u/kg tissue)	No. rats
1	4.5	10	17.5	18
2	1.4	10	—	—
3	3.0	3	—	—

* One unit in the rat liver glycogen deposition test is the amount of bio-activity equivalent to 0.1 mg 17-hydroxycorticosterone (Kendall's compound F, hydrocortisone).

† One unit in the rat survival growth test is the amount of bio-activity that will cause 80% of the test animals to survive for 20 days and grow at an average rate of 1 g/day.

Unmistakable evidence for the existence of adrenal cortexlike hormone activity was observed for each of three individual lots of human placental tissue. It was of particular interest that the ratio of the two types of adrenal hormone activity observed for Lot 1 was approximately 4 survival growth units/glycogen deposition unit. This is essentially the same ratio of bio-activity that is observed for extracts of adrenal tissue, which indicates some similarity in the qualitative character of the extracts of these two tissues. The yield of bio-activity from human placental tissue, however, which was observed to vary from 1.4 to 4.5 units of glycogen deposition activity/kg in these experiments, is much less than that from adrenal tissue. It has been found in these laboratories that the usual recovery of this type of activity is about 25 u/kg from beef adrenals and 50–100 u/kg from hog adrenals.

Studies similar to those just described were also done using equine placentas. The two methods of bio-assay utilized in these experiments were: the rat liver glycogen deposition test and a modification of a test described by Grollman (*6*), involving the measurement of the gain in weight of adrenalectomized weanling rats. The yields of adrenal hormone activity from three individual lots of tissue are presented in Table 2, where it is seen that the glycogen deposition activity varied from 3.0 to 17.0 u/kg of tissue. A ratio of approximately 90 weight gain u/glycogen deposition unit was obtained in the case of Lot 1. Here, again, the ratio of these two types of bio-activity is in the general range of that observed for extracts of adrenal tissue. It is of interest that the yield of total hormone activity from equine placental tissue is about the same as from human placental tissue and thus much less than the yield from adrenal tissue itself.

The small amount of active material that has been obtained to date from placental tissue has prevented the characterization of the individual hormone com-

ponents in these extracts. In fact, the large quantity of tissue required to obtain measurable amounts of bio-activity in each experiment has permitted the use of a relatively small number of assay animals. Thus the results have limited quantitative significance. It would appear, however, that our data offer unequivocal evidence for the presence of adrenal hormonelike activity in placental tissue, without demonstrating whether the active factors have been produced by this tissue or are just stored in it after having been transported from some extraplacental source. If placental tissue does produce this type of hormone activity, it may be discharged rapidly into the circulation. Thus the yield of bio-activity in extracts of this tissue indicate nothing about the dynamic aspects of the production of this material. It is of interest to mention certain clinical observations which may indicate that placental tissue has the ability to produce adrenocorticoid material.

In 1938 Hench (*7*) reviewed the clinical data, which indicated that there is a striking, generally complete, relief from the symptoms of rheumatoid arthritis during pregnancy. The now classical demonstration of the effect of cortisone (*8*) and other adrenal hormones in controlling this disease has been offered as an explanation for the observations in pregnancy. The common interpretation is that the adrenal cortex itself is caused to secrete increased amounts of its hormone factors during this special type of physiological stress. One must also consider, however, the possible secretory capacity of the placenta as a means of augmenting the supply of adrenal hormones.

In 1950 Jailer and Knowlton (*9*) observed evidence for the apparent production of adrenal hormones in an Addisonian patient during pregnancy and suggested that the human placenta might be capable of elaborating adrenal cortical-like hormones.

It would thus seem that the detection of adrenal cortex hormone activity in extracts of human and equine placental tissue may help to explain certain clinical observations associated with pregnancy. Further investigation of the character and source of this hormone activity will be required before its true role in endocrinology is fully appreciated.

TABLE 2

ADRENAL CORTEX HORMONE CONTENT OF EXTRACTS OF EQUINE PLACENTAL TISSUE

Lot No.	Bio-assay procedure			
	Glycogen deposition* (u/kg tissue)	No. rats	Wt gain† (u/kg tissue)	No. rats
1	3.0	3	267.0	10
2	3.4	3	—	—
3	17.0	10	—	—

* One unit in the rat liver glycogen deposition test is the amount of bio-activity equivalent to 0.1 mg 17-hydroxycorticosterone (Kendall's compound F, hydrocortisone).

† One unit in the rat weight gain test is the amount of bio-activity equivalent to 1 μg 11-desoxycorticosterone-21-acetate (DOCA).

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The Fluorine Content of Associated Human and Extinct Animal Bones from the Conkling Cavern, New Mexico

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The discovery of human bones in association with the bones of extinct animals in a cavern on the lower slope of Bishop's Cap Peak in southwestern New Mexico was reported in 1929 by the late William Alanson Bryan (*1*), of the Los Angeles Museum. Roscoe P. Conkling, of El Paso, Texas, discovered the cavern, and hence his name is usually associated with the find. Mr. Conkling is responsible also for the only other description (*2*) of the contents of this cavern. In his account he said very little about the human remains, but he claimed, because of the animal associations and the depth of the deposits, that "proof is conclusive that man was co-existent [in the remote past] with the sloth, camel, horse, cave bear, and great dire wolf." Thus for 20 years the human material has remained incompletely described, and its claim to antiquity has rested solely upon the relationships within the cave.

Early in 1951 I arranged with Hildegarde Howard, of the Los Angeles County Museum, to study the human remains from the Conkling Cavern. Soon thereafter I reported (*3*) my preliminary findings to the American Association of Physical Anthropologists. So far as I can see, the skulls, of which parts of two were found, cannot be distinguished from those of modern Indians. This opinion does not contradict Mr. Conkling's claim as to their antiquity, because evidence from other sources indicates that the first men to reach the Western Hemisphere were already modern in type.

The Conkling find would take on greater importance in connection with the antiquity of man in America if it could be proved that the juxtaposition of the human and animal remains was original and contemporary. To provide objective information on this point, I arranged with F. J. McClure, of the National Institute