Table 1. HÆMOGLOBIN *E* IN MALAYSIANS IN MALAYA

State	No. examined	No. with hæmoglobin *E*	Per cent
Eastern States :			
Kelantan	78	8	
Trengganu	16	2	13·1
Pahang	13	4	
Western States :			
North—			
Kedah	33	1	
Penang and Province Wellesley	26	2	6·0
Perak	25	2	
Central—			
Selangor	101	6	
Negri Sembilan	26	–	5·2
Malacca	7	1	
South—			
Johore	21	–	0
Total	346	26	7·5

of the purified hæmoglobin by freezing and thawing were properties described for hæmoglobin *H*, first seen in a Chinese family in the United States[4].

We hope to continue this survey, and to extend it to other communities of Malaya—of three aborigines so far examined one, a Senoi, showed hæmoglobins *A* and *E*. It seems already that the distribution of hæmoglobin *E* in Malaya follows an ethnological pattern, as was noted for that of sickling in Uganda[5] and of hæmoglobin *C* in the Gold Coast[6] and in Nigeria[7].

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Oxidation *in vitro* of Radioactive Œstradiol by Preparations of Human Tissue

THE oxidation of œstradiol to œstrone and œstriol in the pathway of degradation of the œstrogens has been inferred from *in vivo* studies in which œstrone and œstriol were found in the urine of the male human[1] and œstrone in the urine of other mammals[2] after the administration of large amounts of œstradiol. More recently, Ryan and Engel[3] found an *in vitro* interconversion of œstradiol and œstrone by tissue-slice preparations of several organs of the rat and man. Using counter-current distribution to achieve separation of the steroids, an accumulation of either œstradiol or œstrone was found when the other œstrogen was present in the substrate. These workers were not able to demonstrate formation or utilization of œstriol. We have observed the *de novo* formation of œstrone and œstriol from labelled œstradiol by human-tissue slice and homogenate preparations from a variety of organs.

Tissues obtained from surgical specimens were placed in cold phosphate–nicotinamide buffer[4] immediately after excision. The sera used were freshly obtained pooled sera from the individually centrifuged blood specimens of several female donors. Tissue slices were suspended in 5 volumes of buffer; homogenates were a 20 per cent suspension in buffer; and sera were diluted in 20 volumes of buffer. 7 ml. of a tissue preparation and 1 mgm. adenosine monophosphate, 1 mgm. diphosphopyridine nucleotide and 0·10 mgm. œstradiol-16-^{14}C (2 μc./mgm.) were placed in each flask and incubated at 37° C. under oxygen for 2½ hr. After incubation, 0·15 gm. metaphosphoric acid, 0·5 gm. 'Celite' and 3 gm. sodium chloride were added to each flask. 10·0 mgm. of carrier, either œstrone or œstriol, was then added.

The œstrogens were isolated from an ether extract by the paper chromatographic procedure of Mitchell and Davies[5]. The area which contained the sample and which corresponded to authentic œstradiol, œstrone or œstriol was cut out and extracted with alcohol. This alcoholic extract was evaporated to dryness in planchets, weighed and assayed for specific radioactivity.

Table 1. OXIDATION OF ŒSTRADIOL-^{14}C BY VARIOUS TISSUES

System		(Estrogen recovered (range (counts/min.)/mgm.)	
		Œstrone	Œstriol
Ovary	Slice	4,970–6,139	187–203
	Homogenate	5,130–7,100	87–130
Testis	Slice	3,470	0–4
	Homogenate	4,150	0–4
Liver, male, homogenate		6,350–7,800	20–88
Kidney, male, homogenate		335	—
Muscle, male, homogenate		245	0–18
Serum		30–60	20–84
Blank		20–38	30–37

Liver, ovary and testis preparations, in this order, are highly active in converting œstradiol to œstrone; kidney and muscle preparations are less active. The conversion to œstriol occurs in ovarian preparations, and to a lesser degree in preparations of liver. There is no or negligible conversion in pooled female-blood serum. The homogenates were as active or perhaps slightly more active than comparable tissue-slice preparations.

The incorporation of acetate-^{14}C into œstradiol by tissue preparations of dog ovary prior to its incorporation into œstrone[6] is consistent with the concept that œstradiol is the œstrogen primarily synthesized in the ovary, and that œstrone and œstriol are then formed by oxidation.

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