

A lipoprotein complex may be of common occurrence in naturally tanned structures. In both the cockroach ootheca and in the blowfly puparium, I have clearly demonstrated a lipid to be present throughout the whole thickness of the tanned regions. Furthermore, lipoids have been reported in the exocuticle of Myriapods⁷. It will be of interest to learn whether lipoids are associated with proteins in other tanned structures.

A full account of this and other aspects of the present work will be given elsewhere. My thanks are due to Prof. R. Dennell for his interest and criticism.

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The present findings are slightly higher than those found in temperate climates⁷. The results of this investigation suggest that living in a warm environment for several months or years is not associated with a fall in the packed red-cell volume. The fall in this value found in men during shorter conditions of exposure to heat¹⁻³ appears to have been a temporary change. Recovery of the packed red-cell volume might provide objective evidence of complete acclimatization.

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Packed Red-Cell Volume in the Tropics

It was found that when men stayed in air-conditioned rooms at about 30° C. for a few days their packed red-cell volume fell^{1,2}. A rise in this value was likewise found in conditions of low environmental temperature³. More prolonged exposure to conditions of high environmental temperature caused by change of season was also associated with a fall in the packed red-cell volume³. No satisfactory information about the physiological effect on the packed red-cell volume of people living for several months or years in a warm climate could be found in the available literature. The results of an investigation made in Singapore may, therefore, be of interest.

The subjects were healthy, well-nourished men and women of different races (see table¹) who had lived in the tropics for at least six months, and they were all between twenty and forty years old. Samples of venous blood were collected with minimal stasis, and an ammonium and potassium oxalate mixture used as an anti-coagulant⁴. Estimations of the packed red-cell volume were made by means of Wintrobe hæmatocrit tubes⁵ which were centrifuged for 1 hr. at 3,000 r.p.m.

PACKED RED-CELL VOLUME OF NORMAL MEN AND WOMEN LIVING IN SINGAPORE

Racial group	No.	Mean (per cent)	S.D.	S.E. of mean
<i>Men</i>				
Chinese	73	47.69	6.513	0.7622
Indians and others	58	47.59	7.266	0.9541
European	121	47.02	5.420	0.4927
All males	252	47.35	4.508	0.2838
<i>Women</i>				
Europeans	57	40.56	6.060	0.8025
Asians	21	41.43	9.824	2.1440
All females	78	40.80	5.429	0.6146

The mean packed red-cell volume of 252 men was 47.35 per cent, and that of 78 women 40.80 per cent. Details are given in the table. The differences between the mean value for each racial group were not statistically significant by the *t* test⁶.

Reversal of the Heart-beat in Tunicates

THE mechanism controlling the periodic reversal of the heart-beat in tunicates is still in dispute. Internal control has been thought to exist, and to be due either to local nerve centres¹, or to physiologically differentiated areas of cardiac muscle², at each end of the heart. Evidence from the action of drugs has been conflicting³. Hunter¹ found a ring of cells around each end of the heart which he thought to be nerve cells, and Alexandrowicz⁴ described nerve fibres but was uncertain whether ganglion cells exist.

I have found rings of fusiform cells in the heart of *Ciona intestinalis* (L) which seem to correspond to those described by Hunter¹, but they are connective tissue cells and not nerve cells, being the ends of sheets of connective tissue that line the large blood vessels at their cardiac junction. Von Skramlik² found evidence for the existence at each end of the heart of a small area of cardiac muscle which initiates the beats; alternating dominance of one area over the other would produce periodic reversal. Lahille⁵ believed that certain parts of the peripheral system are unable to accept blood as quickly as the heart supplies it, and that the resulting back-pressure that is built up eventually stops the heart. When the heart starts to beat again, it does so in the opposite direction. Haywood and Moon⁶ have revived Lahille's theory and from it have formulated an equation relating the time of beating in one direction with the number of beats. In support of the theory they produced experimental results which satisfied the equation, and also they failed to observe reversal of isolated hearts, a phenomenon recorded by von Skramlik².

Periodic reversal of isolated hearts, if it could be shown to occur, would be strong evidence against the back-pressure theory, since no such pressure can be built up in a heart not connected with its closed system of vessels. The heart was therefore removed from a number of specimens of *Ciona* and observed continuously for 6-12 hr. It was found that, in most