Table 1

Treatment	Percentage of tubular cross-sections showing acrosome phase of spermiogenesis	Mean percentage
'Ultandren', 0·05 mgm./day	100, 83, 85, 97, 100, 82	91·1 ± 8·71
Methyltestosterone, 0·5 mgm./day	57, 50, 56	54·3 ± 3·79
Control	67, 58, 94, 72	72·8 ± 15·29

percentage of not less than 60 tubular cross-sections observed in 3 non-adjacent testicular sections. The results are indicated in Table 1.

Comparison of the results in control, 'Ultandren'- and methyltestosterone-treated animals shows that with $n_1=2$, $n_2=10$, $F=13\cdot988$, which is significant at the 0·1 per cent level, thus indicating the heterogeneity of the results of the different treatments.

It is apparent that in 'Ultandren'-treated rats the percentages of tubules showing the acrosome phase of spermiogenesis are higher than in the control animals. This difference is significant ($t=2\cdot34$, $n=8$, $P<0\cdot05>0\cdot025$).

When the methyltestosterone-treated and control animals are compared, the testes of the former group show a lower percentage of tubules in the acrosome phase. However, these differences are not significant at the 5 per cent level ($t=1\cdot95$, $n=5$, $P>0\cdot1<0\cdot2$).

Although the results using methyltestosterone are not significant it may be a depressor of spermatogenesis in the doses used. 'Ultandren', on the other hand, in approximately equally androgenic doses, accelerates the rate at which the acrosome phase of spermiogenesis is achieved in the tubules of the immature testis. This finding is of interest, since previous workers have been unable to accelerate the normal process of maturation of the testis[3–6]. It is proposed to study the matter in greater detail.

I am indebted to Ciba Laboratories, Ltd., for a grant for technical assistance and for supplies of the steroids and solvents used in this experiment.

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[1] Lyster, S. C., Lund, G. H., and Stafford, R. O., *Endocrinol.*, **58**, 781 (1956).
[2] Leblond, C. R., and Clermont, Y., *Ann. N.Y. Acad. Sci.*, **55**, 548 (1952).
[3] Rubinstein, H. S., and Kurland, A. A., *Endocrinol.*, **28**, 495 (1941).
[4] Ludwig, D. J., *Endocrinol.*, **46**, 453 (1950).
[5] Barraclough, C. A., and Leathem, J. H., *Anat. Rec.*, **134**, 239 (1959).
[6] Wakeling, A., *J. Endocrinol.*, **19**, 263 (1959).

HÆMATOLOGY

Sensitivity of Hæmoglobin to Oxidation in Various Conditions

When intact red cells are treated with weak solutions of sodium nitrite in isotonic saline, or hæmolysed red cell suspensions are treated with weak solutions of potassium ferricyanide, the red colour changes to brown as the oxyhæmoglobin is oxidized to methæmoglobin. Infants have long been known to be particularly sensitive to this change[1–3]; but it has only recently been shown[3,4] that this increased sensitivity is also present in children of both sexes up to the age of puberty.

Blood samples have been obtained from pregnant women (100), patients with carcinomata (51), other hospital patients (52) and medical and physiotherapy students (100). 96 per cent of pregnancies of more than 6-weeks duration exhibited increased sensitivity of the hæmoglobin to oxidation. A similar, but less-marked, change occurred in the patients with definite carcinomata. Of the other hospital patients only those with acute coronary thrombosis, hæmolytic blood diseases, multiple fractures or severe rheumatoid arthritis showed any deviation from the normal. No case of increased sensitivity occurred in any of the students.

The sensitivity of the hæmoglobin to oxidation rapidly returned to normal after delivery, and, in the few cases so far examined, following complete extirpation of the malignant tumour. The cause of these changes is as yet unknown, and the phenomenon is at present being investigated. The findings will be reported in full elsewhere.

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[1] Betke, K., *Naturwiss.*, **39**, 481 (1952).
[2] Kunzer, W., Ambs, E., and Schneider, D., *Klin. Wschr.*, **31**, 617 (1953).
[3] Metcalf, W. K.. M.D. thesis, University of Bristol (1960).
[4] Keohane, K. W., and Metcalf, W. K., *Phys. in Med. and Biol.*, **5**, 27 (1960).

Experimental Oxidation of Hæmoglobin: its Relation to Growth-rate in Rats

The sensitivity of oxyhæmoglobin to oxidation with nitrites or ferricyanide is increased in children, pregnant women and patients with carcinomata (refs. 1–4 and preceding communication). The change-over from the increased sensitivity of childhood to the adult reaction occurs at about the age of puberty. To investigate the relationship between this reaction and the hormonal changes of puberty, the phenomenon has been studied in rats, as the growth-rate and pubertal changes can be determined and separated much more readily in small mammals than in man.

Rats' hæmoglobin has approximately the same resistance to oxidation as human hæmoglobin and exhibits the same increased sensitivity in the young and pregnant. The growth-rate of some 60 female Lister hooded Worcester sub-strain rats was determined and related to the oxidation sensitivity of their hæmoglobin. Fig. 1 shows that the change-over from the juvenile type of resistance to oxidation occurs at 40–50 gm., which corresponds closely to the time of most rapid change in the growth-rate (40–

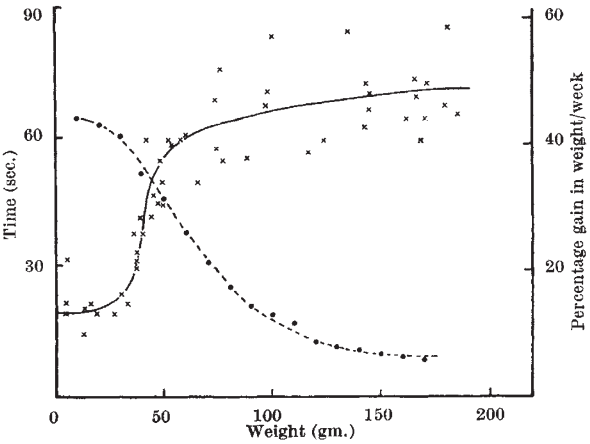

Fig. 1. —×—, Conversion time ; - - ● - - , growth-rate