

Table 1. REPRODUCTIVE STATUS OF EWES TREATED

	Level of oestrogen per day		
	0	8 $\mu$ g	16 $\mu$ g
Ewes alive	92	91	87*
Not mated	6	7	10
No. services	88	94	85
% conceptions	75	59	42
No. non-pregnant	26	36	51
% Non-pregnant, non-return	4	25	41

\* 2 ewes died during the experiment.

Substantial differences between treatments were found in conception percentage and in the percentage of ewes which, although not pregnant, did not return to service within 3 or more weeks after mating.

Some further effects of stilboestrol were evident from the examination of embryos and ovaries of the pregnant ewes, as shown in Table 2.

Table 2. MULTIPLE PREGNANCIES AND CORPORA LUTEA IN PREGNANT EWES

	Level of oestrogen per day		
	0	8 $\mu$ g	16 $\mu$ g
No. pregnant	66	55	37
No. twin pairs	12	5	0
Single corpora lutea	47	50*	35*
Two corpora lutea	19†	5	1
Ovulation-rate	1.29	1.09	1.03
% pregnant, excluding those with two corpora lutea	64	59	41

\* One of these scored as zero corpora lutea.

† One of these scored as single corpus luteum.

From these results it is evident that stilboestrol, administered during mating even at relatively low doses, decreased conception percentages, and affected the oestrous cycle so that many ewes, although not pregnant, did not exhibit oestrus. Moreover, the ovulation rate was considerably reduced, resulting in decreased multiple pregnancies.

The decreased conception percentage was not a result of reduced probabilities of at least one conception associated with decreased multiple ovulation. Of 25 double ovulations observed 16 produced twins. If  $p$  is the probability of fertilization of an ovum, and if this is independent of other fertilizations,  $p$  is estimated as 0.8. The probability of neither of two ova being fertilized is then 0.04. Therefore the number of non-fertilized double ovulations may be neglected without serious bias. Removing all cases of multiple ovulation from our data, the percentages of pregnancies, shown in the last line of Table 2, are seen to differ to an important extent.

The reduced conceptions, and proportions of multiple pregnancies, are consonant with results reported from ewes mated on red-clover<sup>4,5</sup> and lucerne<sup>6</sup>. It seems likely that many cases of unsatisfactory fertility in sheep, especially those grazed on pastures containing appreciable quantities of red or subterranean clovers, could be caused by relatively small intakes of oestrogen during mating. Doses such as these are unlikely to be associated with permanent effects<sup>7</sup>, obvious derangements of mating behaviour, or pathological changes in genitalia. Yet their economic consequences could be far more serious than those reported for prolonged ingestion of relatively large doses other than during the mating period.

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<sup>1</sup> Morley, F. H. W., Bennett, D., and Axelsen, A., *Austral. J. Agric. Res.* (in the press).

<sup>2</sup> Davies, H. L., and Bennett, D., *Austral. J. Agric. Res.*, **13**, 1080 (1962).

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<sup>4</sup> Fox, C. W., McKenzie, F. F., and Oldfield, J. E., *Oregon Agric. Exp. Sta. Tech. Paper*, No. 1233 (1959).

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## CYTOLOGY

## Trisomy of Autosome 16

So far as we are aware, true trisomy of autosome 16 (Denver classification) has not previously been reported, accordingly we wish to record the following case.

The patient is a female *æt.* 59 with certain multiple congenital abnormalities. Her buccal smears on two separate occasions gave 34 and 46 per cent single Barr bodies. The peripheral blood cultured by the technique of Moorhead *et al.*<sup>1</sup> gave the chromosome pattern presented in Table 1 and Fig. 1.

Chromosome No.	43	44	45	46	47	> 47	Total
Cell count	1	1	1	4	91	2	100

The following statistical analysis revealed that the 47's were trisomic for 16: variance of arm ratios (long arm/short arm) of the 3 autosomes 16 in the patient compared with each other was not significant at the 5 per cent level. Variance of arm ratios of these 3 autosomes compared with a control series was not significant at the 5 per cent level ( $F$  ratio 1.42, degrees of freedom 35, 49). Confidence limits based on this variance also indicated that the extra chromosome was unlikely to be an isochromosome of X. This was further confirmed by comparing the total length of this chromosome to the short arm of the X-chromosome.

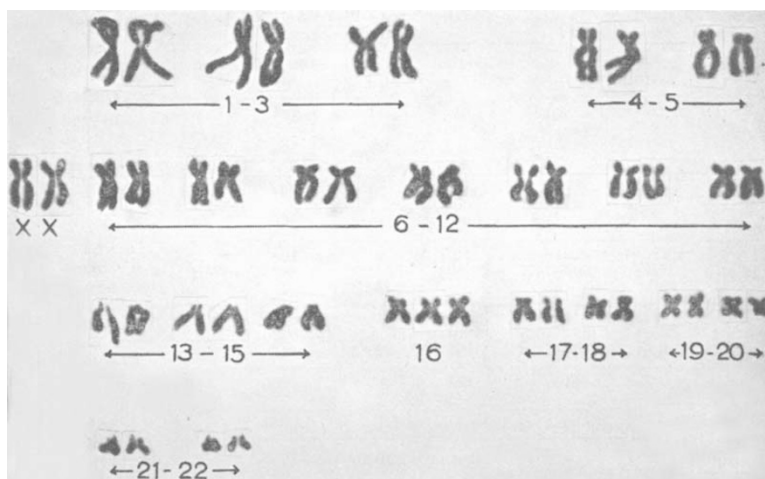


Fig. 1. Karyotype of a typical spread (case 62/750; cell 66)

( $F$  ratio 3.19, degrees of freedom 11, 11, significant at the 5 per cent level.)

Student's  $t$  test on means of arm ratios demonstrated that the extra chromosome does not belong to the 17-18 group. ( $t = 14.34$  degrees of freedom 25, highly significant at the 0.1 per cent level.) These findings appear to establish that this is in fact trisomy of 16, is unrelated to either the 13-15 or 17-18 groups, and is not an isochromosome of X.

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