

but this was not thought necessary with sheep as their wool seemed to provide sufficient protection. At each operation site, a subcutaneous injection of 2-3 c.c. of 2 per cent ethocaine hydrochloride was given as an anaesthetic.

Two Scottish blackface ewes with twin lambs by a Cheviot ram or rams were available. The ewes were unrelated; but it is possible that all four lambs were half-sibs. The ewes were both about six years old. Ewe 27, dam of lambs ♀2K9 and ♂2K8, weighed 112 lb. and had lambed on March 29, 1952; ewe 129, dam of lambs ♀2K4 and ♀2K5, weighed 104 lb. and had lambed on March 26, 1952. All skin interchanges were made on April 30, 1952, when the lambs were about five weeks old.

Four grafts were put on to each animal in a square, thus:

1	2
3	4

On lambs, position No. 1 was occupied by an autograft, No. 2 by skin from an unrelated ewe, No. 3 by skin exchanged between dam and offspring, and No. 4 by skin exchanged between full-sib twins. On ewes, the arrangement was the same, except that position No. 4 was occupied by skin from the second lamb. The grafts on ewe 27 and her lambs behaved as shown in Table 1. The graft from the unrelated ewe 129 on to lamb 2K8 was lost by faulty healing, and the resulting scab obscured the fate of the neighbouring autograft.

Table 1

Recipients	Donors			
	Ewe 27	Lamb 2K9	Lamb 2K8	Unrelated ewe 129
Ewe 27	+	-	-	-
Lamb 2K9	-	+	-	-
Lamb 2K8	-	-	?	lost

+ indicates survival and - indicates a breakdown in 7-14 days

The parallel series of grafts on ewe 129 and her lambs gave the results shown in Table 2.

Table 2

Recipients	Donors			
	Ewe 129	Lamb 2K4	Lamb 2K5	Unrelated ewe 27
Ewe 129	-	Bandage slipped and all grafts lost		
Lamb 2K4	-	+	-	-
Lamb 2K5	-	-	+	-

Of the six independent autografts, all, except the two lost for technical reasons, survived. At the end of a month they were perfectly established and healthy. That on ewe 27 was particularly well defined, as it consisted of black ear skin and carried a good crop of hair easily distinguishable from wool. The remaining live autografts on the lambs consisted of white ear skin which was less conspicuous but carried white hair instead of wool and were readily differentiated from the scars left by the neighbouring homografts. All homografts broke down rapidly, and fourteen days after the operation only dry scabs remained. It has been assumed that the like-sexed pair is dizygous. This is justified by the established rarity of one-egg twins⁵.

These observations make it improbable that, in sheep, homografts between dizygous twins will sur-

vive transplantation. Accordingly, skin interchange could be used as a highly critical test for monozygotic twinning in sheep. The intolerance to homografts shown by two-egg sheep twins contrasts with the tolerance shown by two-egg cattle twins, a difference which is no doubt associated with the fact that free-martins occur in cattle but not in sheep.

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Alteration of pH in the Sheep's Oviduct

DURING previous work on the oviduct of the sheep, evidence was obtained which suggested that a change of pH might be associated with the cyclical changes of mucin secretion¹ in this duct. In a further investigation the pH of the oviducts of seventy sheep, recovered at slaughter from the abattoir, was determined by using Lovibond's comparator. This material covered all stages of the oestrous cycle.

The oviducts were examined within 45-60 min. after death. One oviduct of each animal was washed out with 1 c.c. of double-distilled water, then a further amount of double-distilled water was added to the washing to bring the total amount of liquid to 10 c.c. The first ten oviducts showed a pH with the universal indicator between 6 and 7; therefore in all further work bromthymol blue (pH 6-7.6) and methyl red (pH 4.2-6.3) indicators were employed.

The investigations showed that the pH of the oviduct undergoes cyclical change which seems to correspond to the sexual cycle. Where the specimen was clearly in the di-oestrous stage, a pH of 6-6.4 was found, in pro-oestrus the pH rose to 6.4-6.6 and in oestrus and met-oestrus the pH ranged from 6.8 to 7.0. The phase of the cycle was determined by macroscopical examination of the ovary, and in the majority of specimens the follicle or corpus luteum permitted an accurate estimation to be made. In doubtful cases, however, it was found that the pH of the oviduct was more reliable than the naked eye diagnosis.

After standing for about two hours, it was found that the pH of the specimen fell to 6.2 regardless of the phase of the cycle and the temperature of the refrigerator.

The question arises whether this pH has any connexion with the conditioning factor² which enables the spermatozoa to penetrate the zona pellucida.

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