DNP experiments, hence is in agreement with the observations made by Pfleger, Jacobi and Rummel[13].

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Comparison of Fœtal Pulmonary Fluid with Fœtal Plasma and Amniotic Fluid

The fluid in fœtal lungs has been considered to be aspirated amniotic fluid[1], an ultra-filtrate of plasma or an exudate from the lungs or bronchial system[2]. Scattered and casual reports have appeared in the literature to the effect that, after delivery of a fœtus by Caesarean section, fluid continues to be formed in the lungs on such a scale as to suggest that the lungs may be an important source of amniotic fluid[3]. However, except for one instance[4], no observations on the nature of the fœtal pulmonary fluid have been reported. It has been possible to collect tracheobronchial fluid during the course of experiments on mature fœtal lambs for comparison with plasma and amniotic fluid in this laboratory. The experiments were performed for a different purpose and the observations reported here are consequently limited in scope.

Mature lamb fœtuses were delivered by Caesarean section from ewes anæsthetized with chloralose (30 mg/kg initially). A saline-filled rubber bag was placed over the head of the fœtus and the trachea was surgically exposed. After the trachea was carefully opened, a polyethylene catheter was passed into the trachea to the carina or slightly beyond and the fluid contained therein collected in a dry syringe. The trachea was then cannulated and the chest was opened on the left side. At no time during the procedure did the animal gasp or make respiratory movements. During the following surgical procedure, the left main bronchus was ligated and a small polyethylene catheter was placed in the left bronchial system through a small puncture in the left main bronchus below the ligature. Fluid from the lung was allowed to drain freely into a graduated cylinder, the end of the catheter being placed at the level of the lung or 2–5 cm below the lung. The collection period ranged from 15 min to 1 h. The initial sample of tracheo-bronchial fluid and the subsequent bronchial collection were analysed for osmolarity by the method of freezing point depression, as were samples of amniotic fluid obtained before delivery by needle puncture of the amniotic sac. When it was possible, samples of blood were obtained from the fœtus at the end of the experiment and plasma osmolarity was also determined. The results are presented in Table 1.

Table 1. Osmolarity of Fœtal Plasma, Amniotic Fluid and Tracheal Fluid collected immediately after Delivery (1) and Bronchial Fluid collected after Ligation of Left Main Bronchus (2)

Fœtus No.	Plasma (mosm/l.)	Amniotic fluid (mosm/l.)	Tracheal (1) Bronchial (2) fluid (mosm/l.)	Rate of flow (ml./h/kg)
1364 *A*	339	279	308 (1) 331 (2)	0·85
1344	332	296	315 (1) 334 (2)	6·25
1350	—	258	315 (1) 331 (2)	2·39
1364 *B*	324	276	327 (1) 320 (2)	1·43
1338 *A*	—	302	340 (1)	
1322	—	300	356 (1)	
Average	332	285	327 (1) 329 (2)	

It is evident that the osmolarity of the fluid contained in the fœtal lungs at delivery is intermediate between that of amniotic fluid and that of plasma and is certainly not unadulterated amniotic fluid. Following delivery, while still in the fœtal state, fluid continues to be evolved from the lungs, occasionally at an astonishingly high rate. This fluid is identical in osmolarity with plasma and it would appear, therefore, to be simply a transudate from the pulmonary vascular system, its displacement from the blood stream being a natural consequence of the greater blood pressure which exists in the fœtal pulmonary circulation.

The observations presented here support the view that the lungs may contribute to the formation of amniotic fluid but not as osmotically identical fluid. This finding does not corroborate the observations of Setnikar, Agostoni and Tagglietti[4], who found the osmolarity of the tracheal fluid to be the same as that of the amniotic fluid in goat fœtuses. It may be that their experimental conditions were such as to promote fœtal respiratory movements and aspiration of amniotic fluid just prior to delivery.

Although the initial osmolarity of tracheobronchial fluid is hypotonic to plasma, it would be inappropriate to refer to it as 'amniotic fluid', whether aspirated or secreted, because in every instance the tracheal fluid was hypertonic to the amniotic fluid. The most reasonable inference would be that the pulmonary fluid *in utero* is a filtrate of plasma which is diluted by the diffusive movement of water from the amniotic fluid through the open upper airway or by the occasional bulk movement of amniotic fluid brought about by respiratory movements.

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HÆMATOLOGY

Appearance of Slow α_2-Globulin after Interference with the Liver

Darcy[1,2] first identified a protein in the sera of rats bearing large neoplasms or tight abdominal bandages which was absent in the sera of healthy, non-pregnant adults.

Beaton *et al.*[3] showed the protein to have the mobility of an α_2-globulin in paper electrophoresis but, because it migrates more slowly than β-globulin in vertical starch-gel electrophoresis, it is commonly referred to as slow α_2-globulin (SA_2G).

Beaton *et al.*[4,5], and Heim[6,7] have shown SA_2G to appear in the sera of fœtal, neonatal, young, pregnant and lactating rats, and have confirmed its appearance in rats bearing large neoplasms. SA_2G did not appear in the sera of normal adult or sub-adult, healthy, non-pregnant rats nor in rats treated with œstrogen, progesterone, growth hormone, chorionic gonadotropin, ACTH[8] or thyroxin[8].