of a complex between the clearance material and the yolk protein. Perhaps at least some of the opsonic property of yolk protein is due to the presence of histones in amphibian yolk[10], as basic polypeptides have been shown to be effective opsonins[11]. Because of the observed opsonic behaviour of frog yolk proteins in mice, we suggest that this opsonic property is an important factor in promoting the uptake of yolk protein by developing frog oocytes.

DAVID A. RINGLE
BETTY L. HERNDON

Biological Sciences Division,
Midwest Research Institute,
Kansas City,
Missouri.

[1] Zhand, J. P., *Arch. Anat. Micros. Morphol. Exp.*, **48**, 231 (1959).
[2] Flickinger, R. A., and Rounds, D. E., *Biochim. Biophys. Acta*, **22**, 38 (1956).
[3] Stay, B., *J. Cell Biol.*, **26**, 49 (1965).
[4] Ringle, D. A. (unpublished observations).
[5] Biozzi, G., Benacerraf, B., and Halpern, B. N., *Brit. J. Exp. Pathol.*, **34**, 441 (1953).
[6] Benacerraf, B., Halpern, B. N., Stiffel, C., Cruchaud, S., and Biozzi, G., *Ann. Inst. Pasteur*, **89**, 601 (1955).
[7] Riggs, J. L., Sewald, R. J., Burckhalter, J. H., Downs, C. M., and Metcalf, T. G., *Amer. J. Pathol.*, **34**, 1081 (1958).
[8] Benacerraf, B., Biozzi, G., Halpern, B. N., Stiffel, C., and Mouton, D., *Brit. J. Exp. Pathol.*, **38**, 35 (1957).
[9] Ringle, D. A., and Gross, P. R., *Biol. Bull.*, **122**, 263 (1962).
[10] Horn, E. C., *Proc. U.S. Nat. Acad. Sci.*, **48**, 257 (1962).
[11] Dulaunay, A., Henon, M., and Pelletier, M., in *Reticuloendothelial Structure and Function*, edit. by Heller, J. H., 557 (Ronald Press, New York, 1960).

Origin of Proteins in Amniotic Fluid

THE origin of the proteins in amniotic fluid is not known with any certainty. Previous evidence, obtained from investigations with electrophoretic techniques[1,2] and labelled proteins[3], suggests that they are obtained from the maternal circulation by filtration through the foetal membranes. The fact that human placental lactogen (HPL) is found in appreciable amounts in normal amniotic fluid and maternal serum, while it cannot be demonstrated in cord blood[4], raises the question of whether this protein hormone originates from its maternal or the foetal circulation. This question is important if the endocrine activity of the protein is to be explained.

The *Gc* protein is an α_2 serum protein, which makes possible the classification of human sera into three commonly occurring genetic types 1–1, 1–2 and 2–2.

The types of *Gc* proteins which were present in mother, child and amniotic fluid in 16 cases were determined. The amniotic fluid samples were collected by puncture through the foetal membranes, but samples containing blood were not used. Samples free from blood were cleared by passing them through filter paper. The determination of the *Gc* types was made possible by concentrating the samples twenty to thirty times, using ultra-filtration at +4° C. The final protein concentration was 3–4 per cent. The anti-*Gc* serum used was prepared by immunizing a sheep with *Gc* protein, which had been purified by vertical starch electrophoresis. The resulting antiserum was made specific for the *Gc* protein by absorption with 1/5 volume of normal human serum.

In the seven cases where the mother and the child belonged to different *Gc* types, the *Gc* type of the amniotic fluid was invariably that of the mother (Fig. 1, Table 1). No evidence of any *Gc* protein belonging to the child was found.

Table 1. *Gc* TYPES OF COMBINATIONS OF MOTHER, AMNIOTIC FLUID AND CHILD

A. Mother and child dissimilar

Mother	Amniotic fluid	Child	No.
1–1	1–1	1–2	1
1–2	1–2	1–1	3
1–2	1–2	2–2	2
2–2	2–2	1–2	1

B. Mother and child similar

Mother	Amniotic fluid	Child	No.
1–1	1–1	1–1	7
1–2	1–2	1–2	2
2–2	2–2	2–2	–

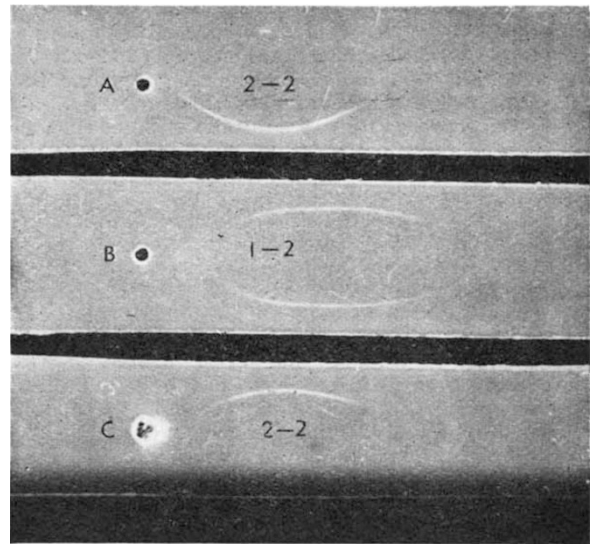

Fig. 1. Immunoelectrophoresis, showing the *Gc* types of mother, *A*; child, *B*; and amniotic fluid, *C*. The *Gc* type of the amniotic fluid is the same as that of the mother.

This investigation shows that the *Gc* protein of amniotic fluid is obtained from the maternal circulation. Taken in conjunction with previous investigations[1–3] and the fact that HPL cannot be detected in cord blood even though it is present in amniotic fluid, our results confirm that most of the proteins in amniotic fluid are of maternal origin.

E. RUOSLAHTI
TH. TALLBERG
M. SEPPÄLÄ

Department of Serology and Bacteriology,
University of Helsinki.

[1] Abbas, T. M., and Tovey, J. E., *Brit. Med. J.*, i, 476 (1960).
[2] Barbanti, A., *Minerva Ginec.*, **8**, 708 (1956).
[3] Dancis, J., Lind, J., and Vara, P., in *The Placenta and Foetal Membranes*, 185, edit. by Villee, C. A. (Williams and Wilkins, Baltimore, 1960).
[4] Tallberg, Th., Ruoslahti, E., and Ehnholm, C., *Ann. Med. Exp. Fenn.*, **43**, 67 (1965).

Extremely High Acuities of Taste for Phenylthiocarbamide in Human Population Groups

A SERIES of solutions of phenylthiocarbamide (PTC) in distilled water have been fairly widely used in recent years[1–3,etc.] in estimating the thresholds of taste for PTC of human subjects. The solutions are integrally numbered from zero, the concentration of solution numbered n being $2{\cdot}60 \times 2^{-n}$ g PTC/l. and the reference material is the solvent itself. Most of these studies, including my own, have relied on sorting trials to reduce the effects of guesswork or mendacity on the part of the subject; the actual number series used has been 0, 1, 2, 3, etc. A subject who fails to discriminate successfully between solution $n + 1$ and distilled water but succeeds with solution n has an (observed) "discriminated solution number" of n, and the best estimate of the "threshold solution number" is considered to be $n + 0{\cdot}5$[2]. Corrections, which are usually small, can be made for the effects of age and sex[2].

By 1957 the highest discriminated solution number that had been encounterod was $\geqslant 18$, and there were no facilities at the time for checking the subject with solutions of number greater than 18. In Hokkaido in 1961,