Comments and Communications

Successful Transplantation of a Fertilized Bovine Ovum

SINCE Heape (*Proc. Royal Soc.* [*London*], **48**, 457 [1890]) first demonstrated that fertilized rabbit ova could be transplanted and young obtained, successful transplantations have been made by other workers with mice, rats, rabbits, and sheep. Umbaugh (*J. Vet. Research*, **10**, 295 [1949]) and Dowling (*J. Agr. Sci.*, **39**, 374 [1949]) have reported unsuccessful attempts with the bovine. This paper is to report what the authors believe is the first calf developed from a transplanted bovine embryo and carried to term. This is the one successful case out of three we have attempted.

The donor was a yearling heifer, one fourth Shorthorn and three fourths Holstein, and solid black except for a few white spots on the body and head. The sire was a purebred Holstein, and the recipient was a grade Holstein yearling heifer, and each had characteristic white feet and switch. Prior to transplantation, the estrual cycles of donor and recipient were synchronized by daily injections of progestationally active concentrate furnished by the Glidden Co. (Christian and Casida, *J. Animal Sci.*, **7**, 540 [1948]). The donor was superovulated by administration of sheep pituitary gonadotrophins (Willett *et al.*, *J. Animal Sci.*, **7**, 545 [1948]), and she was inseminated on the day she received the intravenous injection and again the next day. On the fifth day following the intravenous injection she was slaughtered and the reproductive organs were removed. The fertilized ova were washed from the upper ends of the uterine horns with homologous blood serum approximately 1 hr later. The recipient, which had been in heat 5 days previously, but not inseminated, was anesthetized and a mid-ventral laparotomy performed. The uterus was exteriorized, and a single 8-celled ovum inserted into the lumen of the right horn near the tubo-uterine junction; this was done by puncturing the wall of the uterus with a glass micropipette. At intervals throughout pregnancy the corpus luteum was palpated in the left ovary and the fetus in the right horn. A heifer calf was born 278 days following the intravenous injection of the donor. The calf weighed 84 lbs the day following birth and had black feet and switch. Blood types were determined for the recipient, the sire, and the calf. Three antigenic factors (*A*, *W*, and *S* at three different loci) were carried by the blood cells of the calf that were not carried by the recipient or the sire. The blood of the donor was not studied.

The improbability of fertile sperm being introduced with the ovum into the recipient because of the 4-day interval from last insemination of the donor to transplantation, the further improbability of the egg of the recipient being fertilizable 5 days after her heat period, the position of the fetus in the uterus in relation to the corpus luteum, the color markings, and the blood-type analysis all indicate that the calf developed from the transplanted ovum.

It is believed that this technique, with improvements, may be valuable in the study of certain fertility problems in cows where a question of normality of the ovum vs. normality of the genital tract is involved.

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Two Points of View

WE HAVE read the moving letter of Barbara J. Bachmann (*Science*, **112**, 364 [1950]) and would like to express our complete agreement with her stand on the issue of the freedom of scientific inquiry. We hope that her courageous action in sacrificing personal gains for the concrete expression of her convictions will serve as an example for the many others of us who feel as she does.

The question in this case is not one of the undeniable necessity of the government to protect classified information. The question here is clearly one of ". . . political orthodoxy to sanction the position of individuals in all fields of thought and action. . . ."

As was mentioned in a recent magazine article, we should never lose sight of the fact that freedom of thought ". . . is not a phrase to wind up an oration, or an hierloom to be put aside for safekeeping until good times return. . . ."

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SCIENCE for September 29, 1950, contains a well-expressed and courageous protest against applying a political test to holders of government fellowships for nonsecret work. The crux of the matter is in the protestor's statement, "I think that a law barring from support for scientific training or research persons with particular political views can serve no purpose favorable to the advancement of science." In a world at peace this truth would be self-evident.