Bull Sterility.—The sterility service for bulls was maintained during the season. Similar use was made of it as in previous years. The proportion of sterile and infertile bulls coming up for examination as a means of checking fertility before use, or of determining whether the bull has been responsible for poor conception results in herds experiencing trouble, has been much the same as in previous years.

Five sets of identical twin bulls reached the yearling stage during the year and have been the subject of examination of their reproductive behaviour to determine whether they will provide the material needed to measure the effects of various factors such as exercise, nutrition, and management upon bull-fertility levels. Semen from each pair was collected over a normal breeding season and subjected to a series of laboratory tests. Final analysis of the data is incomplete, but the indications are that such bulls will be so many times more useful for direct experiments of the type mentioned than non-twin bulls that such experiments will now become feasible. The first experiment planned will attempt to measure the influence of feeding upon semen quality and quantity.

Cow Sterility.—The systematic examination of empty cows made available from the artificial insemination herds has been continued. Numbers are as yet insufficient to provide a reliable estimate of the relative incidence of different types of female sterility in our cattle, but, in general terms, previous indications as to the fairly high incidence of ovarian abnormalities have been confirmed. A large proportion of cases are still found for which no definite cause can be given. Arrangements have been made with the English authorities to obtain cultures of *Trichomonas* as an aid to diagnosing effectively this disease and thereby determining its importance in New Zealand.

Work on the pathology of the pituitary gland in relation to the abnormal ovary has been continued.

Contagious Abortion.—Results which have been collected from farms where vaccination has been carried out provide further evidence that inoculation of heifer calves with a vaccine prepared from *Br. abortus*, strain 19, confers a high degree of immunity against contagious abortion. In 1945 returns were available from 1,266 herds for 16,075 two-year-old heifers vaccinated as calves. There were 2·6 per cent. of abortions from all causes among these heifers, whereas in the previous year there were 22·3 per cent. of abortions in 17,098 unvaccinated heifers in the same herds. Examination of post-calving blood samples from 155 aborting vaccinated heifers showed that 69 gave negative reactions and therefore presumably aborted from causes other than contagious abortion. Results were also available in 1945 for 6,537 second pregnancies of animals vaccinated as calves; 2·8 per cent. abortions occurred, but only a little more than half of these was due to contagious abortion.

The demand for vaccine is still growing. For the 1945 season, 110,000 doses were prepared at Wallaceville, and it is anticipated that 150,000 doses will be required for the 1946 season. Arrangements were made to have the 1946 season's requirements prepared at the Commonwealth Serum Laboratories, Melbourne, Australia.

Following Australian reports that high post-vaccination titres result from tail inoculation of smaller volumes of vaccine, an experiment has been commenced in New Zealand.

One hundred and fifty calves have been divided into three groups. One group has been vaccinated with 5 c.c. of strain 19 subcutaneously, the second group with 1 c.c. of strain 19 intra-caudally, and the third group kept unvaccinated as a control. The calves will be reared, mated, and when three to four months in-calf will all be infected artificially with the abortion organism to determine relative immunity obtained from the two types of vaccination.

Attempts are being made to develop a laboratory test, dependent on the differential bactericidal effect of sera from vaccinated and normal animals on suspensions of *Br. abortus*, which will be of value in determining the comparative efficiency of different types of *Br. abortus* vaccines or different methods of administration.

Inheritable Red Blood-cell Characters in Cattle.—Investigations have been continued on the production of reagents to detect the thirty-odd red cell characters of cattle.