

## BIOLOGY

# Revolution in Animal Breeding

Ova transplantation and other processes aid in the breeding of better cattle. By this process mongrels can give birth to pure-blooded puppies.

By SAM MATTHEWS

► SCIENTISTS have not yet begun to experiment with the reproductive processes of human beings on a large scale, but they have created a revolution along those lines for millions of surprised cows, chickens, dogs, rabbits and horses.

Most of them agree that it is scientifically possible to do the same things for humans, if it is desired.

Artificial insemination is already widely practiced. Now scientists are turning the tables. They have succeeded in transplanting the female eggs and the female ovaries themselves.

Near San Antonio, Tex., scrub cows are carrying the calves of a far superior pure-blooded cow. When the calves are born, scientists will have proved it is possible to transfer successfully the fertilized female egg from one cow to another. Theoretically that would allow fine cattle to have 20 calves per year.

In New Haven, Conn., two dogs have outdone the cows. From two other over-age dogs of different breed, these female mongrels have been given the ovaries themselves—the female sex glands. In due course, they gave birth to puppies which did not look at all like mother.

And all over the nation in 1949, more than 3,000,000 dairy cattle were visited by the white-coated agents of artificial breeding associations.

## Artificial Insemination Grows

The growth of artificial insemination among dairy herds has been the most spectacular advance in scientific animal husbandry in the past ten years.

Although 14th century Arabs knew about artificial insemination of livestock, and Russia claims its farmers have used the technique since 1899, it wasn't until the late 1930's that the concept of fertilizing a female animal by artificially injecting the male semen was put to practical use.

Even in 1940, artificial breeding was still confined to agricultural experiment stations.

By 1945, however, there were 225,000 cows enrolled in cooperative breeding associations, and last year more than 3,000,000 cows—over ten per cent of all in the U. S.—were serviced through breeding associations using only 2,000 or so high-caliber bulls. Each bull took care of some 1,300 cows.

Farmers have jumped at the obvious advantages of scientific test tube breeding: it

saves the farmer the investment, danger and maintenance costs of keeping a bull; it gives the characteristics of a better bull than he alone could ever afford; it checks the spread of genital disease in his herd, and it allows him to manage better the seasonal production of calves.

Not only cows are being experimented with. Horses, sheep, swine and poultry are all being bred by artificial means. Even honey bees are being improved in this manner.

In nearly all agricultural research stations, artificial breeding is being used on chickens. By crossbreeding, the scientists search for better, more productive strains of animals.

## 20 Calves a Year Per Cow

A rolling ranch outside San Antonio, manned by scientists of the Southwest Research Institute, founded by Texas oil man Tom Slick, Jr., is the location of a project which would allow a blue-blooded cow to have as many as 20 calves a year, farming

them out to the wombs of inferior scrub cattle.

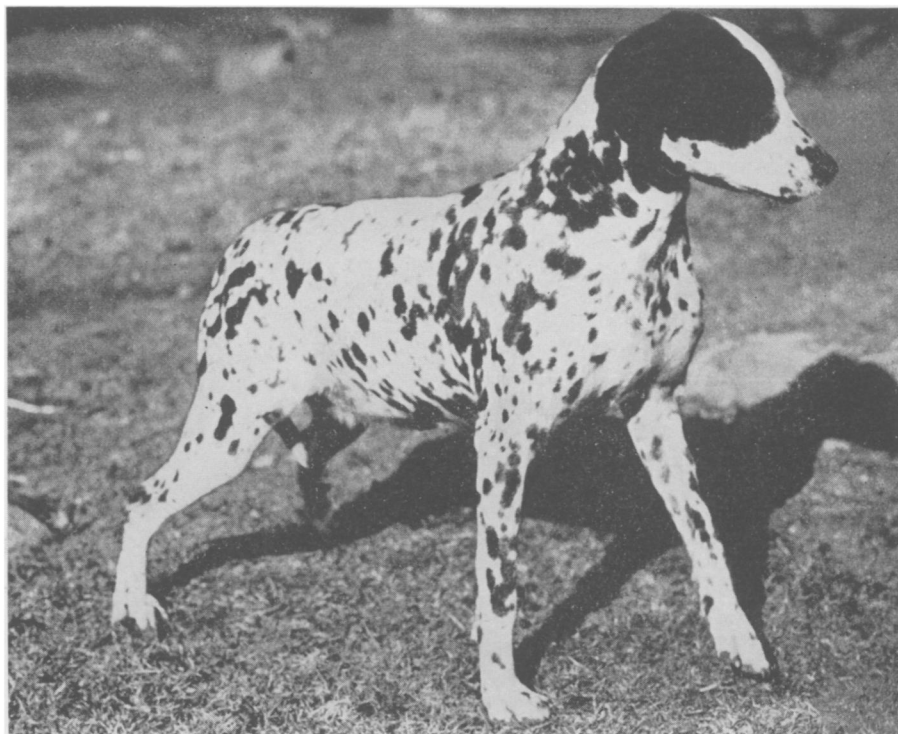
Led by Raymond E. Umbaugh, 28-year-old zoologist, the scientists are working on superovulation and transplantation of ova between cattle.

Nature limits a cow to one ovum each 35 days and only one calf a year. But, by injecting female hormones from the pituitary glands of sheep, Umbaugh's cows have been induced to produce between 23 and 27 ova at the same time.

Then comes the difficult part: taking these super-ovulated eggs from the donor cow, transplanting them to scrub foster mothers, fertilizing them by artificial insemination, and waiting for the foster mothers, nine and a half months later, to give birth to calves with fine characteristics of the original donor cow.

Mr. Umbaugh has followed the lead of Dr. Gregory Pincus of the Worcester Foundation for Experimental Biology in Shrewsbury, Mass., who as far back as 1936 succeeded in producing "fatherless" rabbits from foster mothers.

Dr. Harold Vagtborg, director of the Slick Foundation, called a national conference on ova transplantation last April, pointing out that, "it would be possible to convert all cattle herds into registered stock of the finest quality in a single generation."



**IMOGENE, THE DALMATIAN**—The Dalmatian was one of the dogs that gave birth to the puppies of other dogs after ovaries were transplanted into them.



**BROWNIE, THE MONGREL**—The mongrel dog that gave birth to cocker spaniel pups through the process of ova transplantation is shown with Dr. Leon F. Whitney who performed the operation.

Department of Agriculture officials are not so optimistic. They think it might not be practiced economically.

But it is in a dog hospital outside of New Haven that experiments which most foreshadow the future have been going on.

**Experimentation Continues**

There, Dr. Leon F. Whitney has succeeded in transplanting the complete ovary—the female sex organ—from one dog to another of inferior strain, breeding the second dog by natural means, and obtaining pure-blooded puppies of the donor dog from a foster mother. Working with Dr. Harry S. N. Greene, Yale pathologist, he found that wornout ovaries were rejuvenated when transplanted from an old dog to a young one.

**Application to Human Beings**

If applied to human beings, this new development might mean that a young woman could give a whole new life cycle to an old woman's sex organs and give birth to the older woman's children. Dr. Greene said he saw no reason why the transfer of human ovaries could not be done.

In cattle, this would mean that a champion pedigreed cow could have calves years after she herself is dead. Dr. Whitney plans to try transplantation of cow ovaries in 1950.

Science News Letter, April 1, 1950

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**ENGINEERING**

**Signals Represent Numbers In Memory Tube**

➤ A MEMORY tube that will hold electric signals representing numbers which are fed into it, and give them out later when needed, was revealed in New York to the Institute of Radio Engineers by scientists of the Massachusetts Institute of Technology.

The radio tube is for use in high-speed electronic computing machines sometimes called "giant brains." These computers solve in seconds problems that would require months or years by the pencil-and-pad method. Several are in use in various parts of the country. MIT scientists have taken a forward place in their development.

Other memory tubes have been developed, but none have been found entirely satisfactory. Lack of an adequate memory device has been the major problem facing efforts to develop these high-speed computers, the engineers were told by Stephen H. Dodd, Jr., Dr. Hans Klemperer and Patrick Youtz, all of MIT. This new 400-digit memory tube will solve this problem, it is claimed.

The new tube looks like a glass automobile muffler with an extra pipe coming out of one end. Literally a storehouse for numbers, it will hold its information indefinitely, as long as power is supplied. It can receive a number to be remembered in twenty-millionths of a second and give one out, when needed, just as fast.

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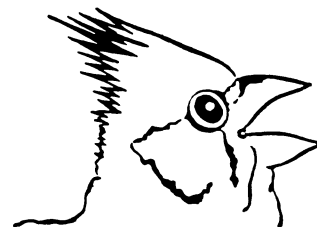
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