

VETERINARY MEDICINE

# Transfusions For Animals

## Methods Used in Giving New Blood to Sick Human Beings Now Adapted for Dogs, Horses, and Other Animals

By LEONARD H. ENGEL

**A** WINEGLASSFUL of life-giving blood is slowly being forced through the fine-pointed hypodermic needle into the veins of Prince.

Prince, a very sick dog indeed, is already perking up. A slight gleam of life is becoming visible in his glazing eyes. Prince is dying of yellow jaundice, a disease which lays low humans and canines alike. But fresh blood gives him a new lease on life.

Ten minutes, during which youthful Dr. Joseph F. Miller, Washington, D. C., veterinary surgeon, slowly contracts his firm hand to push down the plunger of the needle, are required for the operation. Poor Prince—he hardly bats an eyelash. Not even a quiver when the photographer's flash bulbs flare. He's much too sick.

Four hours earlier Dr. Miller had taken 50 cubic centimeters of blood from a husky, healthy setter brimming with life. He added sodium citrate to the blood to keep it from clotting, made himself ready for the transfusion.

### Not New in Medicine

Transferring blood from one individual to another is no new medical story. Doctors have been experimenting with giving blood to the ailing for many centuries. During the last thirty years American surgeons have given blood transfusion the proportions of a mass production industry.

But it is only in the past few years that canine transfusions such as this have become possible. Veterinarians have borrowed from the medical profession and are applying the same life-saving technique to man's best friends, the domestic animals.

Ten years ago a blood transfusion for a human being was still an enormously complicated matter. Blood transfusions for animals were as yet only a wild-eyed suggestion. Today blood transfusion for people has given rise to thousands of professional blood donors, many of them students selling portions of their health to buy an education. To veterinary surgeons, who are seldom far behind the men who save human lives, the new

technique is becoming standard practice and is finding for itself a roseate future.

The blood of animals has almost always been a part of the story of transfusion, one of modern medicine's most spectacular triumphs. In 1654, Francesco Folli, a Florentine physician, transfused blood from one animal to another. Samuel Pepys, the English diarist who seems to have seen just about everything in his day, was one of the witnesses.

### Early Errors Costly

Jean Denys of Montpellier about 1667 took some blood from a lamb and injected into the veins of a lad of 15 summers. Others imitated him, but they soon learned to their cost, as we know now, that blood cannot be transfused from one species to another. The technique was indeed of little value until in 1907 Jansky, a Scandinavian scientist, demonstrated that there are four types of human blood and that they don't mix. From Jansky's time dates the beginning of the modern blood transfusion era.

During the World War an army of American doctors "invading" France taught the world how useful "shots of blood" can be. But the apparatus they needed was cumbersome and complicated. "Vets" did not, as a whole, seriously consider adapting the technique for their own use. The years after the war, however, saw the American mechanical mind reduce to simplicity itself the apparatus needed. After all, simple apparatus is an ironbound necessity for work with animals; it is difficult to tell an animal pained by a piercing needle to lie quietly and take its medicine like a good little boy.

No need is there now to sing the praises of the brilliant technique that has saved countless human lives. A human being cannot lose more than a quart of blood without suffering serious consequences; if he loses more than that, he may die as a direct result or his resistance may be so weakened that he is a ready victim to the first disease germ that happens along. Victims of pernicious anemia were aided materially by new

inflows of blood in the days before the liver extract treatment. Seriously ill patients, their blood count lowered by prolonged sickness, are given helpful "lifts" by "shots" of the life-saving fluid. Transfusions still rank high on the list of weapons in the arsenal of the physician fighting blood poisoning, whether it come from a rusty nail in the backyard or the "kiss of death" of a king cobra snake. The same cases apply to animals.

The same year that saw the beginning of the depression saw the University of Pennsylvania's professor of veterinary physiology, R. S. Amadon, tackle the problem.

Dr. Amadon found that the blood of oxen needed no typing. He found also that the "vet" who wishes to pump healthy blood into the circulatory system of a sick horse had better conduct tests in advance to make sure that the bloods would mix. If he didn't he was liable to have the same trouble that cursed the medical fraternity prior to Jansky's experiments: bloods that didn't mix destroyed each other with resulting blood clots and the like, and sometimes, death to the unfortunate individual in whose system occurred the deadly chemical combat.

### For Internal Hemorrhage

Uses for the new technique are many and varied, but in general they are similar to the tragic necessities of human accident. Soberly, Dr. Amadon remarks at the conclusion of his most recent paper on the subject:

"It may be stated in closing that although the use of transfusion has been discussed from the standpoint of its application in horse and cattle practice, the same indication exists in small animal practice, especially in canine practice in the urban community where animals are frequently injured by automobiles and suffer severe internal hemorrhage."

Autos and disease both take their toll of the pets the neighborhood's families have accumulated, whether by taking in strays (such as the unfortunate Prince, who just wandered into a farmer's home four and a half years ago) or by purchase. Human medical practice has shown and veterinary experience has confirmed also that transfusion is a valuable treatment in cases of shock from some severe injury.

But, perhaps unfortunately, in the

case of horses and cattle transfusion cannot become a widely-used therapeutic treatment for some little while at least. It's an expensive business and the average cattle-owner is a cattle-owner as a means of making a living, not because he happens to like Bossy. For that reason, before he orders the county animal doctor to force new life into Bossy's sick veins he will sit down and figure the cost: which will cost more: to fix Bossy up or to buy a new Bossy?

### Donor Upkeep Expensive

Dr. Miller finds that he has to charge in the neighborhood of \$5 for each transfusion. He points out that he must keep "donor" dogs in his hospital, and that sometimes they may go for two or three months without being called on to supply blood to an ailing member of the species. The big setter that furnished the blood for Prince can eat a small fortune in the form of hamburger and dog biscuit in a couple of months. Donor dogs must be kept in absolutely top-notch physical condition.

Giving blood to a horse, although the direct transfusion method generally used appears to be simple, is in reality a much more complicated affair because of the need for typing the blood right then and there. No Jansky has come forward to type the blood of horses, so each "vet" must make the test for himself when it has been decided that a transfusion is necessary.

### Several Horses Needed

Professor Amadon advises the newcomer to the art to have more than one donor horse on hand in case blood from the first donor and the recipient horse are incompatible. First thing the "vet" does when horses, instruments and assistants are ready is to draw a thimbleful of blood each from the horse that needs blood and from those that will give it.

After allowing the specimens to clot, he pours off the liquid serum and adds a little weak salt solution. He shakes it vigorously until the salt solution is bright red from blood cells suspended in it. Thus cells and serum are separated. On a pane of glass he places a row of drops of serum from the horse that will get the blood transfusion.

Into the first drop go a few of the cells from the same blood specimen as a "control." The doctor knows that these cells and serum, at least, will mix satisfactorily; and the appearance of the "smear" gives him a ready means of



### NEW LIFE FOR A VERY SICK DOG

*Ten minutes were needed to pump in the blood, minutes during which Prince didn't wiggle an ear or a tail once.*

checking the behavior of the mixed specimens.

After suitable mixing the doctor looks carefully. The first specimen, a mixture of the recipient's own serum and own blood cells, will be homogeneous. If the donor's cells mix with the recipient's serum, that specimen too will be homogeneous. But if not, it will be granular in appearance. And the "vet" knows that he had better try the next donor. Otherwise instead of having to worry about a sick horse he may have to explain away a dead one to the owner.

A syringe to provide the motive power and six feet of rubber tubing, to allow room for maneuvering the animals, furnish the pipeline highway for the blood. A milk bottleful of salt solution, handy also on your own doctor's instrument table when giving you a transfusion in case of a sudden drop in blood pressure, is kept available.

### Horses Easier to Treat

In his sober, scientific language, Dr. Amadon reports that horses are nice and quiet when they are being so treated. But the ox, apparently, doesn't know quite so well what's good for him. "The ox is more resistant to restraint and venous puncture than the horse." Animal doctoring is thus apparently another profession not without its honorable risks. The Pennsylvania scientist, who is a practical farmer as well, recommends stanchions and plenty of room for maneuvering the obstreperous oxen.

The saphenous vein in the hind leg is

often used in giving blood to dogs. A vein in the neck serves as the entrance for new blood into a horse or an ox. Arteries are never used, nor is the "vet" in a hurry about pumping in the life-giving fluid. Loading the blood into the arteries or pumping it in too rapidly is likely to overload the heart that has been weakened by not having enough blood.

### Must Watch Pulse

Harking back to the old days of bleeding a person as a preliminary to curing him (sometimes it helped kill the patient, however, as in the case of George Washington), veterinary surgeons sometimes bleed a horse before giving him healthy blood, much the same as one might drain the oil from an automobile crankcase before refilling. But not all the blood is taken out first.

In contrast to human medical practice, in which dosages of blood have been somewhat standardized through long experience, veterinarians have not yet worked out just how much blood a horse should be given for a particular ailment. Instead the animal doctor, at the same time he is squeezing the syringe to pump in blood, is noting the patient's pulse. When it has returned to normal, the doctor knows that the transfusion is complete.

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