It might be suggested that the ejaculation of liquid semen after repeated biweekly electroejaculation is the result of some physiological change affecting either vesiculase production by the coagulating gland or else some other factor involved in the clotting mechanism. This might be due either 1) to frequency of ejaculation or 2) to electroejaculation of larger volumes of semen than might be delivered under the normal conditions of coitus, with the result that the ability of the accessory gland system to regenerate some essential part of the clotting mechanism is exceeded. A further investigation of this problem will use the addition of a purified vesiculase to these liquid specimens to determine whether failure to coagulate is due to a lack of vesiculase.

Summary. A method and an apparatus for routine electroejaculation of guinea pigs were developed, the semen coagulum or "vaginal plug" examined, and the coagulation process described. A series of proteolytic enzymes were tried for their liquefying activity and 0.1% chymotrypsin was found to result in consistent liquefaction and good sperm motility. Mean ejaculate volume was 0.5 ml and mean motility at 39°C was 51%. There was no evidence of gross morphological or histological changes in the reproductive system of guinea pigs electroejaculated at biweekly intervals.

I am indebted to Mr. Lloyd Schoenbach for the design and construction of the electroejaculator and to Mrs. Olga Radimska for histological preparations.

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Apparatus for Continuous Intravenous Infusion in Dogs. (24100)

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Several types of apparatus for intravenous infusion of fluids in dogs have been developed, each designed to meet particular needs of different investigations(1,2,3). The main feature of the apparatus described here is a standard assembly consisting of a reservoir bottle, drip device and connecting tubes leading to indwelling intravenous catheter, commonly employed in clinical hospital practice. The polyethylene catheter is introduced into an external jugular vein as described by Zimmermann(4). The bottle is suspended under a swivel, with a flexible support for the connecting tubing arranged so that the dog has almost complete freedom of movement in a spacious cage while fluids are infused during varying periods of time.

Apparatus, Fig. 1: *1.* Pulley roller on ¾ inch round rod, held 4 feet above top of cage, permits backward and forward movements of dog. *2.* Swivel hook hanging below pulley, turns freely through a complete circle. *3.* Square ⅜ inch steel rod, with hook at top, suspended from swivel. *4.* Light coil spring, fastened at its top to the rod by adjustable clamp and at its lower end to a bracket (*5*), which slides up and down on rod. Attachments of spring are adjusted to give tension strong enough to hold the bracket, tubing and harness at a level comfortable for the dog. *5.* Sliding bracket with 2 square holes fitting the steel rod loosely. Excursion of the bracket

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downward is limited by adjustable cotter pin placed in one of several holes at 2-inch intervals in rod. *6.* A reservoir bottle, suspended from an arm at top of square rod, delivers fluid through a standard infusion set with drip device and adjustable screw clamp on tubing for control of flow. That illustrated is the Mead Johnson Co. disposable unit. To permit finer regulation of flow a standard tunnel clamp can be substituted for the simple screw clamp shown. *7.* Flexible metal tubing (BX electric conduit) through which passes the connecting rubber or plastic tubing. This metal conduit is secured to the sliding bracket (*5*) and to a universal joint (*8*), above dog's harness. *8.* Universal joint which permits 4-way flexing movements, connected by a detachable bayonet lock to a post (*8a*) mounted on metal plate (*9*) on dog's harness. *9.* Metal plate on which is mounted the post (*8a*) with bayonet lock, and another post (*8b*) with a clamp for holding the hilt of a needle on which the plastic catheter (*10*) is fitted. *10.* Polyethylene catheter leads from the needle into an external jugular vein, with a generous coil to allow the dog's head ample freedom. *11.* Harness, with adjustable leather straps. The polyethylene catheter is sterilized by filling and soaking in a solution of 1:1000 Zephyran solution a few hours. It is then rinsed with salt solution and left filled with heparin-saline solution, with attached needle and plug.

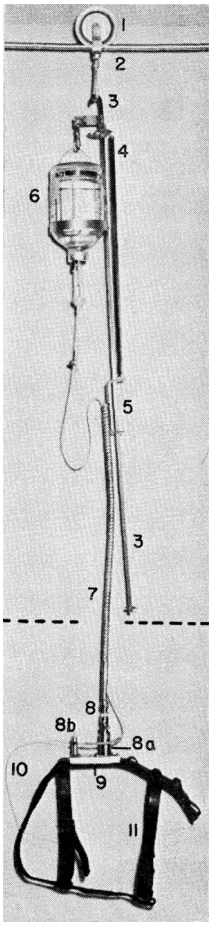

FIG. 1. Assembly of dog's harness and supports for reservoir bottle and intrav. drip apparatus.

Procedure. Clip closely the hair around dog's neck from shoulders to back of head. With the dog tied, either back down or on one side, place 1-inch band of adhesive tape partly around neck just above a point selected for entering the external jugular vein. At that point inject novocaine intradermally and allow time for the anesthetic effect. With a scalpel point make a small incision through the skin over the vein. With syringe attached to 14 or 15-gauge needle, insert needle through incision into the jugular vein. Withdraw some blood to prove a good entry. Remove syringe and quickly insert the polyethylene catheter tubing through the needle and 8 or 10 inches into the jugular vein. Inject a few cc of heparin-saline solution, then plug tubing with the wire. Remove the 15-gauge needle from jugular vein while pressing a finger on skin over the needle tip in the vein to hold the catheter in place. Wipe the catheter with saline soaked gauze to remove blood. For protection, place over the catheter a rubber or plastic covering tube, just long enough to reach the back of the neck behind the occiput, leaving 12 or 15 inches of the catheter tubing free. With short strips of adhesive tape, anchor this covering tubing to the skin and to the adhesive tape that was first placed around the neck. Make a firm protective collar by wrapping 3-inch gauze bandage around the neck several times. Fasten the gauze securely in place with 2-inch wide bands of superimposed adhesive tape. Place the harness on the dog and tighten straps to fit

snugly, with the dog standing up. Remove the wire plug from the tubing, insert a 21-gauge needle and again inject some heparin-saline solution. Insert a plug in the hilt of the needle and clamp the hilt on the supporting post (*8b* in Fig. 1).

Place dog in the cage, above which the assembled perfusion apparatus has already been suspended. Connect the metal conduit tubing to the supporting post (*8a*) by means of the bayonet lock. Remove the plug from the needle and insert the adapter tip of the tubing of the drip apparatus. Open the adjustable screw clamp to allow drops of fluid to flow at a chosen rate.

Discussion. The design of this apparatus is similar to one developed in this laboratory several years ago and used successfully in studies on effects of ammonium chloride acidosis on insulin action(5) and on glucose tolerance(6). In the earlier version a bicycle chain was used to support the tubing between reservoir and connection to the indwelling intravenous catheter, to allow up and down movements of the dog while protecting against twisting of the tubing, as was first employed by Jacobs(1). The flexible metal conduit as now used serves the same purpose but is simpler and permits easier assembly of the tubing than did the bicycle chain.

Summary. This report describes a simple apparatus for continuous intravenous infusion of fluids in dogs, employing a standard assembly of reservoir bottle and flexible connecting tubing that leads to the dog's harness and a plastic catheter dwelling in an external jugular vein. Suspension of the apparatus by a swivel above the dog's cage permits the dog almost complete freedom of movement during long periods of continuous infusions.

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Some Effects of Aureomycin and Penicillin on Thiamine and Riboflavin Metabolism in Growing Rats.* (24101)

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Investigators have found that certain antibiotics stimulate growth in young animals of several species but the mode of action has not been fully elucidated. It has been shown that the resulting growth response depends on the antibiotic used, animal species, composition of diet, and on sanitary condition of the environment. In general, antibiotics are less effective in stimulating growth when fed with nutritionally complete diets to animals maintained under sanitary conditions. These observations suggest a relationship between growth-promoting effect of antibiotic and intestinal flora of the animal. Lih and Baumann (1) reported vitamin-sparing action occurring in rats subsisting on antibiotic-containing diets sub-optimum in certain water-soluble vitamins. They reported penicillin to be more effective in stimulating additional growth in rats maintained on thiamine or riboflavin-deficient diets than are other antibiotics whereas in pantothenic acid deficiencies penicillin was least effective. Sauberlich(2) reported the thiamine-sparing action of aureomycin or penicillin to be greater in rats receiving dextrin-containing diets than in rats receiving sucrose-containing diets. He also reported the effect of these antibiotics to be greater when

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