presence would not exceed one-fifth the quantity of III on the basis of the weights of the two fractions with the presumable chromatographic polarity.

The formation of III, the 3α-hydroxyallo derivative, as a major transformation product of an adrenal perfusion is of particular interest, since reduced corticosteroids isolated from beef adrenal extracts have been found to have almost exclusively the 3β,allotetrahydro configuration. In fact, only the 3α,allotetrahydro derivative of 17α-hydroxycorticosterone has thus far been identified from this source (*6, 7*). Moreover, after adrenal perfusions of Δ^4-3-ketosteroids such as cortisone (*1*) only the 3β,allotetrahydro derivatives have so far been isolated. In these instances, the 3-ketoallodihydro derivatives were also found. The appearance respectively of the α- or β-epimeric saturated 3-hydroxy derivatives after adrenal perfusions of saturated and unsaturated 3-ketosteroids may suggest that these two structures undergo a sterically different course of biohydrogenation.

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A Remotely Controlled Pipetting Apparatus for Radioisotopes

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With increasing interest in the utilization of radioactive isotopes in biological experimentation and medical therapy, means for processing isotopes by remote control are essential to prevent exposure of operating personnel.

The two foremost health hazards that are involved in working with radioisotopes are danger from excessive radiation and the possibility of radiation from within the body as a result of ingesting radioisotopes. Under these conditions a remote control pipetting apparatus for handling "hot" solutions becomes a necessary item of equipment for most radioisotope laboratories. Although descriptions of some remote control pipetting devices have appeared in the literature and several are available commercially (*1–4*), the apparatus described here permits pipetting at a considerable distance from the operator without entailing a similarly long air column in series with the pipet, thereby minimizing the tendency for the meniscus to overshoot. Furthermore, this apparatus may be utilized not only with simple "distance shielding" but will also allow the operation to take place within a totally shielded enclosure for work at higher levels.

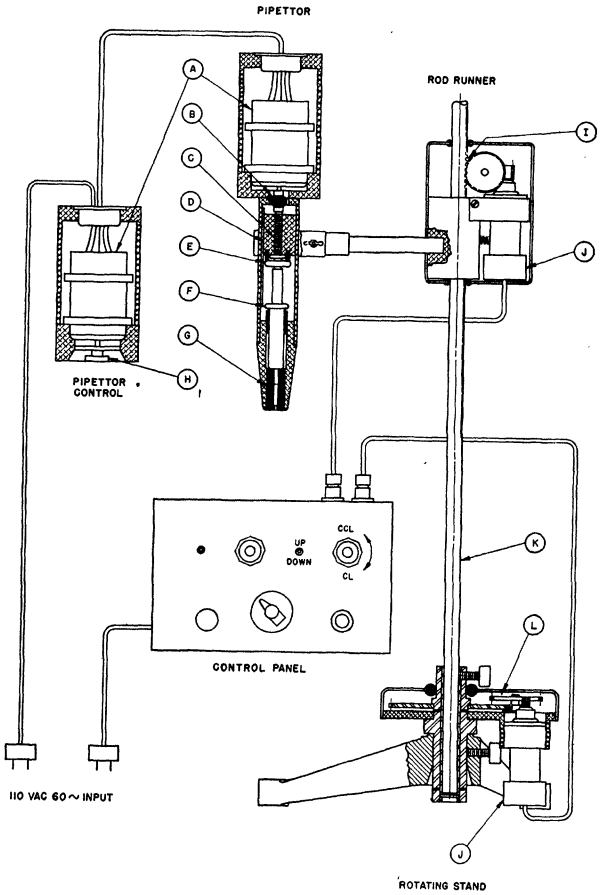

FIG. 1. A, synchro motors; B, flexible coupling; C, ¼—40 lead screw; D, keyed nut; E, self-aligning spring connection; F, hypodermic syringe; G, rubber grommet; H, control knob; I, rack drive; J, gear motors; K, framing rod; and L, gear reduction.

The pipetting device shown schematically in Fig. 1 makes use of three "building-block" appliances: a rotating ringstand, a rod runner, and the pipettor itself. These items are not available commercially but can be duplicated and combined to permit a variety of motions.

The rotating ringstand is a tube mounted in bearings on a tripod base, driven in rotation by a small dc gearmotor at speeds of from 0 to 3 rpm. The inside diameter of the tube was made ½ in. to permit the use of the common size laboratory rod. The control box contains a variable transformer and rectifiers to provide variable voltage dc power.

The rod runner (*5*), which is controlled from the same panel, contains a similar dc motor. A worm on the motor shaft engages a worm gear which is spring-loaded into a tapered groove in the rod to develop the necessary frictional driving force.

The pipettor is designed to accommodate glass hy-

podermic syringes in sizes ranging from 0.1–5.0 cc. For the insertion of various sizes of pipets, the rubber grommet of a Caulfield pipetting bulb is used. The plunger of the syringe is fastened to a long nut that is keyed against turning in the aluminum tube. A finely threaded lead screw engages the nut to impart the plunger motion. The lead screw, in turn, is rotated by a synchro motor that is housed in the large-diameter portion of the instrument and is electrically connected to a synchro generator (pipettor control) located next to the control box. Synchro instruments of the No. 3 frame size develop sufficient torque for this application.

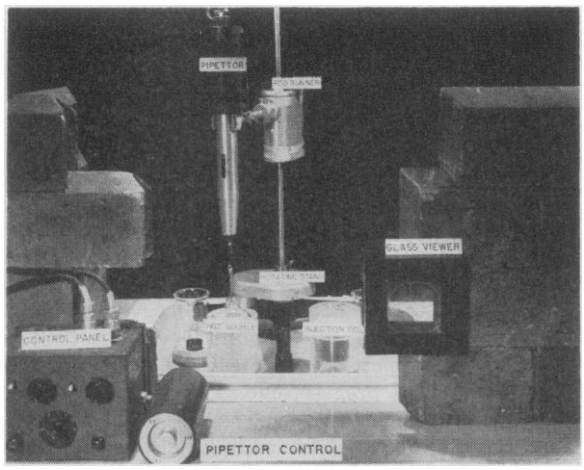

FIG. 2. A remotely controlled pipetting apparatus for the dispensing, diluting, and sampling of radioactive solutions.

These synchro instruments, which are sometimes available at low cost through electronic surplus houses, are not motors or generators in the usual sense. Connected by five wires of any reasonable length and excited with 110 v, ac, the motors of the two instruments follow each other's motions as if connected by flexible shafting. Turning the knob of the pipettor control in this application, thereby turns the lead screw of the pipettor an equal amount and can control the plunger position to within 0.0002 in. A small window is cut through the side of the tube, through which the gross motion of the plunger may be observed. When the plunger "bottoms" in the syringe the resistance to continued rotation is readily perceived at the control knob.

Figure 2 shows the pipettor,[2] rod runner, and rotating ringstand behind a lead shield in a typical laboratory experiment in which an experimental injection solution is being prepared from a "hot" source such as the stock isotopes received from Oak Ridge.

The 360° rotation of the rotating ringstand, the vertical motion of the rod runner, and the automatic pipettor provide all the necessary motions needed for the dispensing, diluting, and sampling of radioactive solutions. The accuracy of the delivered volumes with this apparatus compares favorably with that obtained by hand pipetting with the same pipets. Although the function of this apparatus has been described primarily for pipetting radioactive solutions, it can be advantageously applied where more complete manipulative facilities are not available, or where the required motions are sufficiently simple and repetitive to make its use desirable.

[2] The authors wish to thank Atlee S. Tracy for photographing this apparatus.

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The Effect of Progesterone on Rate of Phosphate Release from Adenosine Triphosphate by Rat Liver Homogenates[1]

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In a previous paper we have described the variation of phosphate release from adenosine triphosphate (ATP) by homogenates of human endometrium during the menstrual cycle (*1*). The ATP phosphate-releasing enzymes present in the endometrium show an increase of about 50% in activity from the fourteenth to the twenty-second day of the normal cycle, dropping off slightly in activity thereafter. Since the urinary pregnanediol curve has a peak at this same time, it was of interest to investigate further the influence of progesterone on the enzymes of the adenylic acid system. Rat liver homogenates were chosen as a source of the enzymes, as the alcohol used to dissolve the progesterone proved to inactivate partially the endometrial enzyme but had no detectable effect on the rate of ATP dephosphorylation by the liver homogenate. It is of course realized that the rat liver enzyme might be quite different from the human endometrial enzyme, but the results are nevertheless considered of sufficient intrinsic interest to record.

Methods. For the determination of the rate of phosphate release from ATP the method resembles that of DuBois and Potter for ATPase (*2*) except for the volumes employed. One-half molar barbituate buffer (*3*), 0.04 *M* calcium chloride, and distilled water were pipetted into a small beaker in the ratio of 3:1:2, respectively. When progesterone was to be added, it was first dissolved in absolute ethanol, and this solu-

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