

At each cardiac contraction, the sinus is seen to beat first. This is immediately followed by the contraction of both auricles, which in turn is followed by the ventricular contraction. If hæmorrhage has been avoided, the heart during diastole is filled with blood and its chambers are pink and soft. During systole the chambers become pale, firm, and smaller in size. The number of heart beats per minute is estimated. Cold Ringer's solution—a saline solution suitable for the heart—poured on the heart, is seen to slow the beat, and warmer solutions increase the rate. Heated above 40° centigrade the solution will stop the heart.

A record of the auricular and ventricular beat is made by attaching, with a pin and string, the tip of the auricle and the ventricle to levers which write on the smoked paper of a revolving drum (Fig. 21). A tracing similar to Fig. 25 is obtained. The auricle is seen to beat before the ventricle. A string tied tightly about the groove separating the auricles and ventricle will stop the ventricular contraction for a time, because it removes the control which the auricle normally exerts on the ventricle. After a short time the ventricle will begin to beat again, but at a slower rate and with no relation to the auricular beats (see p. 164).

### C. The Action of Inorganic Salts on the Heart.

A turtle's heart is prepared exactly as in B. The auricular tracing, however, may be omitted. A small cannula, filled with Ringer's salt solution and attached to a perfusion bottle by means of rubber tubing, is inserted through a V-shaped incision either in the vena cava or the auricle of the heart, and is securely tied in position with a silk thread. The large arteries leading from the heart are cut with a scissors to allow the Ringer's solution to flow out freely. If, in place of Ringer's solution, one made of pure sodium chloride and distilled water (0.7 per cent) is used, the heart beat will slow down and finally cease. If a few drops of solutions of potassium and calcium chloride be added to the fluid, the heart will again beat normally. If after restoration of the beat, a solution containing only sodium and potassium salts be perfused, the heart will cease to beat in extreme diastole; if one containing only sodium and calcium is used, it will cease to beat in extreme systole.

## DEMONSTRATION No. 2.

### A. The Factors which Maintain the Blood Pressure.

A small animal is injected with morphine, and after the animal becomes very drowsy, a solution of urethane (0.5 c. c. of 2 per cent solution per kilo in 20 c. c. water, body weight) is introduced by means of the stomach tube. After the animal is completely unconscious, it is tied