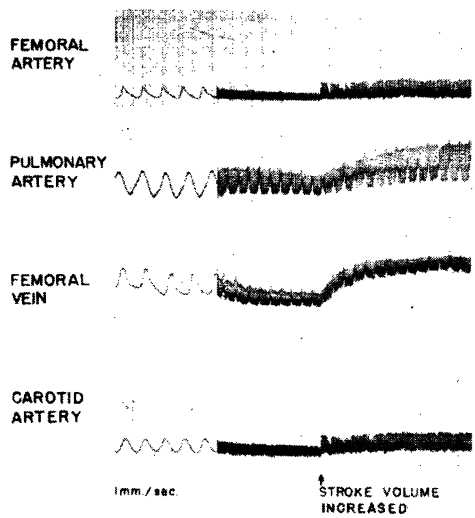


FIG. 3. Cuttings from tracings in femoral, carotid, and pulmonary arterial pressures and systemic venous pressure. Paper speed at 25 mm/sec changed to 1 mm/sec. Stroke volume of pump was suddenly increased at the arrow, resulting in an abrupt elevation of systemic arterial pressure, followed by a more gradual elevation of pulmonary arterial pressure and venous pressure. (The pulsations in the latter probably are transmitted from the aorta, the catheter being introduced into the femoral vein and advanced into the inferior vena cava.)

as compared to same animal when the pump is used to substitute for the left ventricle. This application appears to be a useful method of separating the peripheral from the cardiac actions of agents that affect the cardiovascular system. Detailed physiological data will be reported elsewhere.

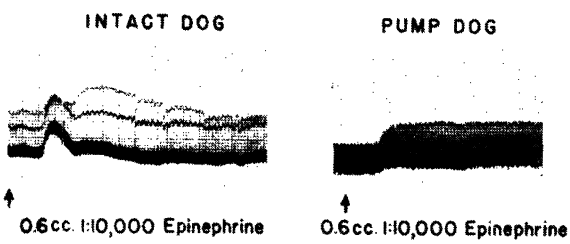


FIG. 4. Cuttings of femoral arterial pressure following the intra-aortic injection of 0.6 mg epinephrine in a dog before and after substituting the pump for the left ventricle. In the intact dog an initial vasoconstrictor response is seen as the epinephrine stimulates the peripheral vessels. Later, as this agent reaches the heart the cardiac effects predominate, with a further rise in systolic and a fall in diastolic pressure. After replacing the left ventricle with the cardiac pump, a similar dose produces only the initial vasoconstrictor response.

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## Kallikrein and Shwartzman-Active Substances

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An observation is described concerning a combined action of Kallikrein and certain filtrates from bacterial cultures capable of producing the Shwartzman (*1*) phenomenon. This phenomenon in its basic form is a hemorrhagic reaction in rabbit skin. An intracutaneous injection of the bacterial filtrate, followed 24 hr later by an intravenous injection of the same filtrate, elicits the reaction at the prepared skin site within 4 hr after the intravenous injection. Many variations and modifications of the phenomenon are known, but it has remained unexplained. Kallikrein, the blood pressure lowering factor described by Kraut, Frey, and Werle (*2*), is chiefly found in the pancreas, from which it enters the blood and is kept inactivated, being activated only under certain conditions, such as stasis and changes in the pH. Kallikrein, given intravenously, brings about dilatation of the peripheral vessels, thus lowering the blood pressure. It also enhances the permeability of the dilated vessels. Much intricate detail is known concerning the enzymelike behavior of Kallikrein. The factor has not been isolated chemically.

Two experiments with different ways of combining Shwartzman-active substances and Kallikrein are reported here, but other combinations have been examined with the same result: hemorrhagic reaction.

One hundred sixty units of Kallikrein were dissolved in 0.5 ml of Shwartzman-active meningococcus bacterial filtrate and injected intravenously into the ear of a rabbit. The ear was clamped for 3 min, during which the injection was performed. In less than 4 hr a severe hemorrhagic-edematous reaction was evident in the ear, which was hanging down thick and filled with blood. A slight pull caused the hairs of the ear to come off in tufts, exposing a wet, dark red-blue distended surface.

Control rabbits receiving Kallikrein only, and in a dose of 160 units, showed hyperemia of some duration, but no other reaction.

In the second experiment, when an intracutaneous injection into the skin of the abdomen of the rabbit was made with meningococcus bacterial filtrate, and followed 24 hr later by an intravenous injection of 160 units of Kallikrein, a strong hemorrhagic-edematous reaction resulted at the site of the intracutaneous injection in less than 4 hr after the intravenous injection.

Further work on the subject, together with the interesting theoretical aspects, will be published.

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