

The reaction can only be elicited in rabbits capable of giving positive skin tests to bacterial protein. We have shown in another series of experiments that it is these strong reactors who resist infection when virulent *B. lepi-septicum* organisms are injected intradermally, while the negative reactors usually succumb to a rapidly spreading infection. It appears that this prompt activity of the endothelial cells is related to the focal immunity of the animal.

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Some Results of the Application of High Pressures to the Heart.

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Localized pressure applied to muscle or nerve is commonly employed to depress, or abolish function in these tissues. In the present experiments our purpose is to observe the effects of high pressure upon the heart when applied in a manner so as to give equal compression throughout the organ.

A special compression chamber has been constructed which is capable of withstanding pressures of 80 atmospheres, and is large enough to admit a small optically recording membrane manometer with a frog, or turtle heart attached. The heart and optical manometer are completely filled with Ringer's solution and mounted in the compression chamber which is also completely filled with the solution. In this manner the heart is surrounded inside and out with the Ringer's solution, and the pressure when applied to the heart is through this liquid medium.

Since the source of pressure in our experiments is nitrogen gas, provision is made also, for the liquid system of the compression chamber to be continuous through a small bore tube to a reservoir of about 100 cc. capacity. The reservoir is partly filled with Ringer's solution, and from the top of it a small tube leads to a high pressure nitrogen tank. In one end of the compression chamber a small window, backed with heavy plate glass, provides a way for recording the movements of the manometer system produced by the contractions of the heart.

When pressure of about 60 atmospheres is applied to a normal beating heart, an increase of nearly twofold is produced immediately

in the amplitude of its contractions. The maximum augmenting action of compression is not shown in the first cycle after the onset of pressure, but usually it requires from 3 to 5 cycles for the full effect to take place. This delay does not appear to be related to the manner of introducing the pressure, since it occurs similarly in instances where the full 60 atmospheres is turned on almost instantaneously. If the pressure is maintained on the heart the records show a gradual decline in the height of the contractions. With release of the pressure the effect on contraction is equally striking but opposite in character—the contractions show a sudden falling off to an amplitude considerably below the pre-pressure level. There follows a period of recovery which varies in degree in different experiments, but commonly the records show a complete return to the pre-pressure amplitude. The changes in contractility accompanying the application and removal of pressure suggest that the nature of the effect of compression is a physiological stimulation, and not due to purely mechanical factors.

Hearts beating normally by their own automaticity show a definite increase in rhythm immediately following compression. The increase in rate is most apparent in the series of cycles immediately after the onset of pressure, but following this a gradual slowing of the rate is shown while the compression is maintained. When the pressure is released the rhythm shows a sudden marked slowing, but usually returns again approximately to its original rate within a period of approximately five minutes. In some experiments preparations were used which exhibited partial heart block. Under compression the condition of block is relieved and a normal rhythm established, indicating that pressure has a beneficial effect on conductivity.

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Studies on Crown Gall Transplants.

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That great difficulty is experienced in transplanting spontaneous animal tumors to other animals of the same species is well known. Yet, transplanted animal tumors once established may be transferred from animal to animal of the same species for many years with con-