causes a striking loss of sodium through the kidney[4] makes it reasonable to assume that the beneficial effects of NaCl upon the symptoms of adrenal insufficiency in this patient were due to the replacement of sodium lost from the body.

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Production of Extreme Pulmonary Compression and Cirrhosis.

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The purpose of the experiment was to determine how much a capsule of fibrous tissue surrounding a pulmonary lobe would compress the lobe by spontaneous contraction, especially when no adhesions existed between the lobe and its environs. The visceral pleura of the lobe was caused to produce the fibrous capsule by the envelopment of the lobe in a loosely fitting sac of foreign material.

Three dogs were anesthetized and operated upon aseptically. The right lower lobe was exposed through an intercostal incision and was wrapped completely in an envelope of thin rubber (2 dogs) or of surgical gauze (1 dog), care being taken that neither the lobe nor the vessels at the hilus were compressed appreciably by the sac, even when the lobe was fully expanded. The chest was then closed, without leaving pneumothorax. The dogs were allowed to survive and were examined roentgenographically from time to time. Sacrifice and autopsy were done 5 months after operation in one case with a rubber sac and 7 months after operation in the other cases.

All 3 dogs recovered from the operation and returned to vigorous health. One with a rubber sac developed a massive accumulation of exudate in the right pleural space and the others showed much smaller accumulations; but the exudate gradually disappeared to a large extent. At autopsy in the cases with rubber sacs, the right lower lobe was found to be still contained within the envelope, which was now much crumpled, and to be reduced to about the size and shape of the 2 terminal segments of a man's finger, smooth and firm. Section showed that the lobe was covered with a heavy fibrous capsule and was composed of grey, densely packed fibrous tissue in which a few completely collapsed bronchi were discernible. There was no excess of pleural fluid. In the case with the gauze sac,

the right lower lobe was surrounded by a fibrous capsule as thick as, or thicker than, that in the other dogs. The capsule encompassed and permeated the gauze and attached the lobe firmly to the ribs, diaphragm and other surrounding structures. The lobe was uniformly air-containing and about the same size as the other lobes when the lungs were removed and allowed to deflate. On section, its parenchyma was found to be congested but otherwise normal in gross appearance.

Histological examination of the lobes encased in rubber showed that the visceral pleura was transformed into a thick layer of scar tissue and the parenchyma was crossed in many directions by an irregular network of wide fibro-hyaline trabeculae. Between the trabeculae lay tightly compressed bronchi and connective tissue but no alveoli or bronchioles. The main bronchus was so greatly compressed that the cartilages were bent, broken and imbricated, although the mucosa was intact. Nowhere was there sign of inflammation or necrosis. The blood vessels seemed patent. The lobe covered with gauze looked quite different except for the presence of the fibrous capsule. The structures were all present, the alveoli were partially air-containing, a few areas presented leukocytic or erythrocytic infiltration, and cellular debris occupied some of the bronchioles.

Thus, all 3 right lower lobes were compressed to some extent. The one wrapped in gauze was reduced in size but not to the extent of airlessness; while the lobes covered with rubber were compressed not only to airlessness but much more. That is, the latter were very much smaller than they would have been if atelectatic and uncompressed. This implies that much of the tissues of the compressed lobe had been caused to disappear. The reason for the difference between the effects of the 2 kinds of sac seems to be that, in the dog with a gauze sac, fibroblasts penetrated the gauze, bound the lobe to its environs, and permitted the ribs and the other more or less rigid parts surrounding the lobe to resist the contraction of the fibrous capsule to a considerable extent; whereas, in the other dogs, the fibroblasts were unable to penetrate the rubber so that the visceral capsule was left perfectly free to contract. The elasticity of the rubber could not have caused the compression, since the sac was loose even at the start.

The causes for the development of cirrhosis and for the disappearance of so much of the parenchyma need elucidation.