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-

siderable ease. The transplants take approximately in all cases.

Jensen claims[1] that successful transplantations of spontaneous and artificially produced crown galls of the sugar beet may be made on the sugar beet without stimulating the host tissue itself to crown gall formation.

The present report deals with the inoculation of young parts of tobacco, tomato, geranium, sugar beet, yellow and red mangels, rubber and castor bean plants with pieces of crown gall tissue arising on similar plants from inoculations, with virulent strains of *Bacterium tumefaciens.* Pieces of crown gall tissue of *Ricinus communis,* when transplanted into the same and other *Ricinus* plants, produce small crown galls in all cases. Transplants of the growths of the second generation to other plants were also found to be effective in producing crown gall tissue. These new growths, however, were generally much smaller than those produced by the primary inoculation with the bacterium or with the crown gall inoculum.

Ricinus crown gall tissues transplanted to growing portions of the tobacco plant were also found to produce galls. Similar results were obtained with crown galls of tomato, geranium and the beet. These neoplasms, however, are not conclusively of the inoculum type, but are generally of the host type, for, while it is impossible to distinguish *Ricinus* crown gall on tobacco from tobacco crown gall, it is clear that these crown galls are strictly of tobacco type and origin. The crown gall tissue on the tobacco became differentiated and formed leafy shoots with characteristic tobacco leaves.

In the majority of cases, observed in these studies, the crown gall inoculum invariably dried up and died 3 to 4 days after the transplant was made, yet in actively growing plants, which received the inoculation, swellings were observed from 7 to 21 days later, and well established crown galls, although small, were to be seen about a month after the transplant was made. This occurred whether homeo, auto, or heterotransplantation was made.

The transplantation of small maroon colored pieces of sugar beet crown gall induced by *B. tumefaciens,* to the yellow colored mangel ("yellow tankard"), produced a relatively large number of yellow pigmented crown galls, and in a small number of cases only, there was indisputable evidence of the growth of the inoculum as shown by the presence of maroon colored crown gall on the yellow root. However, in all cases, there were also distinct proliferations of the host, as shown by gross sections of the tumor. Microscopical examination of the tissue after the usual fixation methods, fail to

show any difference between them. There is, however, a distinct proliferation of the host tissue.

These studies show that the crown galls are not generally formed as the result of the growth of the transplanted tumor tissue itself, but are produced as the result of the changes which succeed the introduction of *B. tumefaciens* with the inoculum. Plate cultures of parts of the crown gall tissue from which inocula were taken, always yielded an abundance of *B. tumefaciens* as determined by cultural studies, smears, and subsequent inoculations.

[1] Jensen, C. O., *Meddelelser fra den Kgl. Veterinaer—og Landbohjskoles Serumlab.*, 1918, liv, 91-143.

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Demonstration of a Toxin in Cases of Pemphigus.

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Pemphigus is a skin disease of a very grave nature, often leading to a fatal outcome. There is practically nothing known concerning its etiology. In connection with a routine examination of various pharmacological properties of blood samples obtained from a variety of skin diseases, the authors have discovered certain properties characteristic of the blood of pemphigus patients, which point to the presence of a toxin in that disease and which throw light on the etiology. One of the authors has already pointed out that by means of phytopharmacological methods it can be demonstrated that the blood serum from patients suffering from pernicious anemia is very toxic for plant protoplasm.[1] This reaction of pernicious anemia blood is very characteristic and is not given by the blood from other cases of anemia, leukemia, etc., so that a differential diagnosis can be made by using the phytopharmacological test. An examination of blood serum from 8 cases of pemphigus has revealed that such serum is also definitely toxic for plant protoplasm. The toxicity, however, is of a different nature from that shown by pernicious anemia blood. The experiments were made by studying growth of seedlings of *Lupinus albus* suspended in a nutrient plant physiological solution, and in the same solution plus 1% of pemphigus serum. The phytotoxic index of 8 cases gave an average of 56%. This figure is a