its own form for many transfers. In liquid media the new variant reproduces its own form for a number of transfers, but usually between the fourth and sixth subculture a change occurs. Diplococci of the usual morphology appear in the cultures, and colonies of 2 distinct types develop on plates streaked from such cultures: (1) those above described and (2) the original parent type. Further transfers in liquid media result in the appearance of an increasing number of cells of the original parent type until the entire culture appears to revert to its original form.

The morphological evidence suggests that the development of the new colony type is an indirect and not a direct product of the parent colony. On the other hand, reversion of the new colony type to the parent form appears to be sudden and abrupt. The organisms so far studied in the new variant form are bile-soluble, autolyze readily and possess relatively little virulence for white mice. Bacteria-producing colonies similar to the extremely rough variant above described and showing similar growth characteristics are frequently found in normal throats.

In a recent communication, Hadley[1] postulated the existence of this new variant form of pneumococcus and predicted its salient characteristics in a remarkable manner. The basis for Hadley's forecast and the place of the new colony variant in the phenomenon of bacterial dissociation will be considered in a subsequent communication.

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Effect of Sodium Chloride in Treatment of a Patient with Addison's Disease.

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It has been shown recently that the sodium content of the blood of patients suffering from Addison's disease is decreased[1] as it is in adrenalectomized cats,[2, 3] and that adrenalectomy in dogs results in a

[1] Hadley, P., personal communication.

[1] Loeb, R. F., *Science*, 1932, **76**, 420.

[2] Marine, D., and Baumann, E. J., *Am. J. Physiol.*, 1927, **81**, 86.

[3] Zwemer, R. L., personal communication.

similar change, due to loss of sodium through the kidneys.[4] Soddu found that the symptoms of adrenal insufficiency in dogs "were relieved slightly by saline injections"[5] and many investigators, notably

TABLE I.

Date	Total Base m.eq. per l.	Na m.eq. per l.	K m.eq. per l.	Ca m.eq. per l.	Cl m.eq. per l.	HCO_3 m.eq. per l.	PO_4 m.eq. per l.	SO_4 m.eq. per l.	Serum Protein m.eq. per l.	Non-Protein Nitrogen mg. per 100 cc.	Glucose gm. per l.	Blood Pressure mm. Hg.	Remarks
7-19-32	136.3	123.5	5.3	5.3	88.6	21.8	2.6	2.3	15.1	39.0	0.73	85/55	Blood taken shortly after admission. Profound weakness and vomiting.
7-26-32	125.8	107.8	7.1	4.8	72.7	21.5	2.4		16.9	45.0	0.80	65/48	Critically ill. Almost *in extremis.*
8- 2-32	147.5	133.0	5.1	5.9	93.8	27.5	2.6		13.5	20.6	1.20	84/60	No more vomiting, sitting up. Treated with one dose of Eschatin and then NaCl.
11-14-32	150.5	139.9	4.6	5.5	107.3	24.3	2.2		14.4	20.0	1.16	112/74	Up and about at home, doing part of housework. Eats 7 gm. NaCl daily plus diet. Slight puffiness of eyelids.
1-24-33	139.5	126.8	5.7	5.6	92.3	21.2	2.5		16.6	35.0	0.91	86/60	After 7 dys. salt-poor diet weak and vomiting frequently. Confined to bed.
1-30-33	150.1	138.0	5.0	5.2	103.5	25.9	2.2		15.1	25.0		122/80	After no further treatment except NaCl added to diet and given by rectum. No vomiting. Much stronger.

[4] Loeb, R. F., Atchley, D. W., Benedict, E. M., and Leland, J., in press.

[5] Britton, S. W., *Physiol. Reviews,* 1930, **10**, 617.

Marine and Baumann,[2] have shown that injections of salt solution prolong appreciably the life of adrenalectomized cats. Rogoff[6] has stated that "the intravenous administration of physiologic solutions of sodium chloride" becomes an "indispensable adjuvant in the treatment of Addison's disease with extracts representing the hormone of the adrenal cortex." This investigator attributes the action of NaCl solutions to the relief of "toxic accumulation" for which no evidence has been presented other than the accumulation of urea in the blood. In view of these facts, the responses of a patient with Addison's disease to the feeding and withdrawal of sodium chloride have been followed over a period of 6 months. This patient (P.H. 347860) presented the classical picture, complaining of progressive weakness, loss of appetite and weight and increasing pigmentation of the skin, nipples and buccal mucous membranes. Her blood pressure when first seen was 90/60. X-rays of the chest and abdomen were negative. There was a mild secondary anemia. Urine and stool examinations were negative.

The results of the various studies of the blood are shown in Table I. During the first week following admission, the patient's condition grew progressively worse, until the seventh day, when she became critically ill and her blood pressure fell to 65/48. Her complaints were profound exhaustion, slight dyspnoea and increasing nausea and recurrent vomiting. There was never any suppression of urine. The abnormalities present in the blood on the second morning after admission had increased enormously as her condition became more grave. Because of the decreased sodium concentration in the blood it was decided to try the effects of large doses of NaCl. (A single dose of 10 cc. of Eschatin was given intravenously at the onset of treatment, but this amount could hardly be adequate to influence materially the subsequent clinical course.) She was given about 9.5 gm. of NaCl a day by proctoclysis and 5.0 gm. daily by mouth in capsules. Within 4 days the clinical improvement was so striking that the rectal administration of salt was stopped, but the patient continued to take between 5 and 7 gm. of salt a day, in addition to a liberal amount in her diet. Table I shows the simultaneous improvement in the blood picture. The patient continued to gain in strength and was discharged on a regular diet, plus 1½ teaspoonsful of salt daily. Her blood pressure was at this time 102/70. After 6 weeks of this regime at home, the patient was able to do part of her housework and had vomited but once. Her

[6] Rogoff, J. M., *J. Am. Med. Assn.*, 1932, **99**, 1309.

blood pressure was 106/70 and she had gained 7 pounds. Three months after discharge, she had gained 4 pounds more and her blood pressure had risen to 112/74. There had been no more vomiting, but she noted slight puffiness under her eyes in the morning. Blood studies at this time (11-14-32) showed no abnormalities except that the chloride level had slightly surpassed the normal. Five months after discharge, while still eating 7 gm. of salt daily in addition to her diet, the patient reported that she was quite well. She had vomited once after strenuous Christmas shopping. She complained of some puffiness of her ankles at night and of her eyes in the morning. Her blood pressure was 122/80 and the urine was normal.

In view of the presence of slight edema, the patient was advised to discontinue NaCl administration and to take a salt-poor diet. One week later, she was admitted to the hospital with the story that after 2 days of this regime she became so weak that she was forced to go to bed. For the 5 days preceding admission, she became progressively weaker and vomited at frequent intervals. She had lost 7 pounds in one week, her blood pressure had dropped to 92/70 and by the next morning it was 86/60. Examination of the blood on this day (1-24-33) showed the striking drop in sodium and the other findings characteristic of adrenal insufficiency. The patient was given 7 gm. of NaCl by mouth daily and rectal taps of 200 cc. of physiological salt solution every 4 hours. No other therapeutic agents were used. After 3 days, her clinical condition had improved strikingly and the taps were discontinued. On the eighth day after admission her pressure was 122/80, she had gained 4 pounds and was discharged the next day feeling very well. The blood findings at this time (1-30-33) were once more essentially normal.

In a typical case of Addison's disease, the symptoms of severe adrenal insufficiency were relieved by treatment consisting of the administration of NaCl by mouth and by rectum. The patient remained in a state of comparatively good health for 5 months, during which time she ingested 7 gm. of salt in addition to her diet. Withdrawal of salt resulted in a recurrence of the symptoms of severe adrenal insufficiency requiring prompt hospitalization. This attack of adrenal insufficiency was also treated by the administration of sodium chloride, with the result that the patient was discharged symptom-free after 9 days. The correlation between the clinical condition and the changes in concentration of sodium in the blood is obvious.

This fact associated with the evidence that adrenalectomy in dogs

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,