between, 0.60 mg, 0.48 mg and 0.12 mg respectively. Since the *ce* adrenal gland was heavier than the *C57black* and *dba's* weight, which were the same, the amount of carbon was calculated per milligram of adrenal tissue. These calculations are given in Table I. The ratio of the "steroid" to the "lipid" fraction is 1:38 for the *dba,* 1:5 for the *C57black,* and 1:4 for the *ce* strain.

The 3 strains vary not only in their amount of total lipids but also in their amount of the two fractions. The chemical analysis of the adrenal glands of genetic strains of mice indicate the existence of different amounts of "lipid" and "steroid" contents that appear at present to be associated with the incidence of mammary gland tumor.

This work is being continued and extended and the present conclusions are naturally of a preliminary and tentative nature subject to further study.

14841

Effect of Increased Protein Intake on Nitrogen Retention in Hypoproteinemic State (Meleney Ulcer).*

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Information pertinent to the protein intake requirements and some of the results obtained by means of daily feedings of large quantities of protein from two sources to a patient with a Meleney type ulcer of the anterior abdominal wall, comprise the subject matter in this presentation. K.P., age 33, University Hospital Case 740032, had a Meleney ulcer with the edges subcutaneously dissected which traversed the abdomen from one iliac crest to the opposite side, had engulfed the umbilicus, and extended nearly to the costal margin. The progress of the lesion had been associated with a large weight loss, anorexia, febrile episodes, and general bodily and mental deterioration. She was reluctant even to eat when fed by ward attendants, nor would she cry out for medication when in distress. A continuous 24-hour-a-day intragastric drip feeding program with 100 g of powdered bovine plasma protein in 500 cc of water and sufficient quantities of diet to approximate 4000 calories daily were given. After one week, these quantities were increased to 200 g of powdered bovine plasma protein and enough diet to provide more than 4800 calories daily. The hemoglobin value percentage of plasma proteins and albumin fraction were secured at the start of the feeding, during the course of the project, and at its conclusion. Blood volumes were obtained at the start and finish. This data has been recorded in Chart 1. The most striking rise in the plasma protein value occurred in the albumin fraction which increased from 2.7 g% on 6-19-44 to 3.7 g% on 7-12-44. While the hematocrit rose from 32.5% on 6-19-44 to 35.5% on 7-19-44, the blood volume was enlarged from 3.93 liters to 5.5 liters during the same interval. It is obvious that plasma protein regeneration has been effective by this feeding schedule. The magnitude of the quantities regenerated is hardly appreciated until the factor of increased blood volume is brought into the calculations. It is then apparent that the total albumin content of the plasma volume has been nearly doubled during the test period. Such data serves to emphasize both the hazard of submitting such a patient with a reduced blood volume to any additional blood-letting and the wisdom of providing for restoration of vascularly retained fluids before surgery is undertaken. Interesting also, is the seeming failure of the body to act effectively on avail-

* The researches presented here were supported by grants of the Augustus L. Searle Fund for Experimental Surgical Research, the Citizen's Aid Society, and the Graduate School of the University of Minnesota.

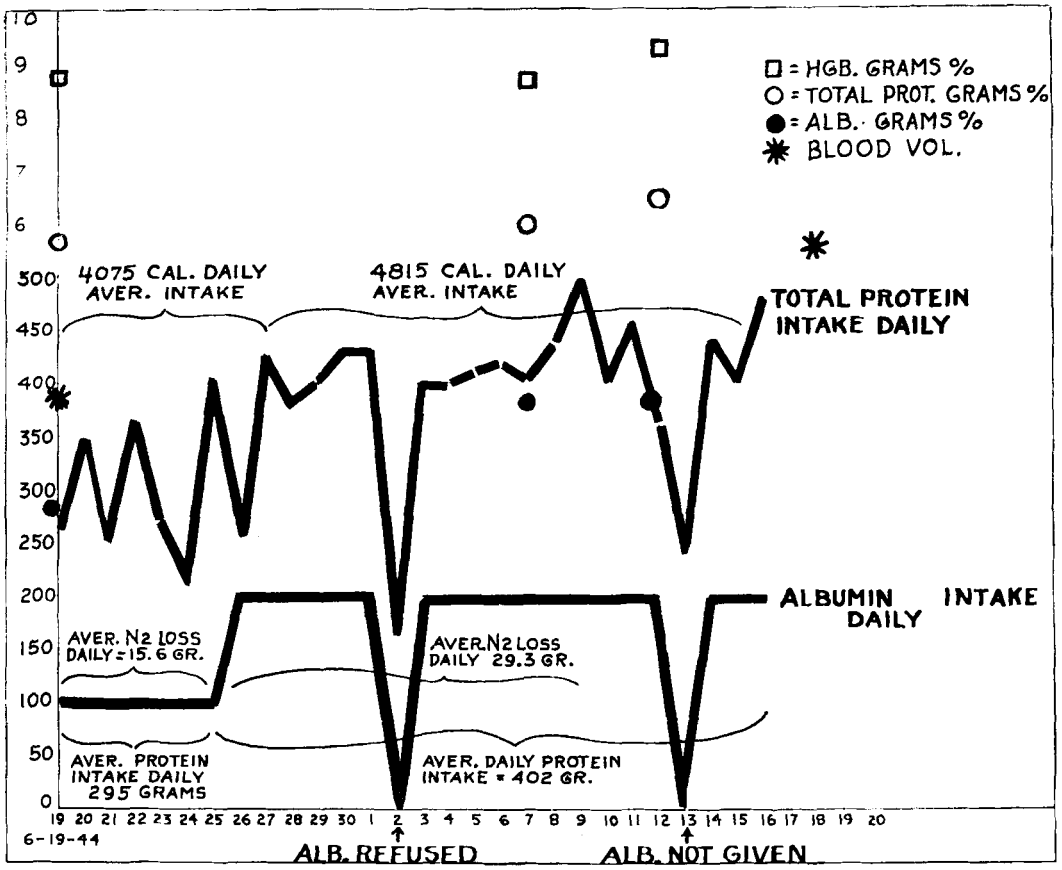

CHART 1.

Effect on Plasma Protein Value of Adding Powdered Bovine Plasma Protein to Diet of Patient with Melency Ulcer.

Calculation of Albumin Gain.

Blood volume 6-19-44	3.93	liters
Hematocrit 6-19-44	32.5	%
Plasma albumin fraction 6-19-44	2.7	g %
Calculated circulating plasma albumin	71.62	g
Blood volume 7-19-44	5.5	liters
Hematocrit 7-19-44	35.5	%
Plasma albumin fraction 7-12-44	3.7	g %
Calculated circulating plasma albumin	131.26	g
Calculated gain in circulating albumin	59.64	g

able protein, *i.e.*, there is a progressive rise in the intake-conversion ratio. That is, increasing the protein content of the diet from the average of 295 g to 402 g daily actually contributed but 20 g additional daily to the protein retained by the body since the remaining 85 g were lost through an increased daily excretion of urinary nitrogen. In the presence of a real need for protein fabrication the mechanisms controlling this phase of metabolism find limitation rather in their own processes of conversion, rather than in the digestive and absorptive abilities of the intestine. This impression is corroborated by very low values obtained in analysis of the stool content for protein nitrogen.

Discussion. The results of Madden[1] and Whipple suggest that powdered bovine plasma proteins would be an excellent source of material for promoting plasma protein regeneration. A liberal supply has been made

[1] Madden, S. C., and Whipple, G. H., *Physiol. Rev.*, 1940, **20**, 194.

available for investigational purposes.†

The results of this study, an earlier one, and unpublished data, suggest strongly that it is therapeutically feasible to raise the plasma protein values under the conditions outlined. The real elevation of the plasma albumin fraction and the total quantity of plasma albumin, due to an increase of the blood volume, appear significant. It is suggested by these data and similar observations on other patients being prepared for operation by feeding of a diet rich in protein and carbohydrate and low in fat, that the intolerance to surgical trauma exhibited by such chronically wasted patients, is related to just such a contracted blood volume.

Conclusion. Feeding powdered bovine plasma protein to a patient made hypoproteinemic by a Meleney ulcer, was associated with an elevation of the plasma protein value. A large measure of this increase occurred in the albumin fraction. A daily intake of more than 500 g of protein was well tolerated by an ill patient.

† Provided by Armour and Company, Chicago.

14842

Effect of a Chromatin Derivative on the Healing of Skin Wounds.

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Experiments which are to be reported elsewhere showed that chromatin given intravenously produced a marked stimulation in the rate of mitosis in the regenerating liver of the rat.[1] We wish here to describe preliminary results obtained when a fraction derived from chromatin was applied to skin wounds.

Rat liver was perfused with 0.9% of NaCl and blended into 4 volumes of 0.9% of NaCl for 2 minutes in a Waring blendor. Three-tenths molar NaOH was added during the blending in amounts sufficient to bring the pH to 7.4. The suspension was treated by the method of Claude and Potter[2] in order to isolate the filamentous substance they have called chromatin. The chromatin was lyophilized and extracted with boiling 50% acetone-50% alcohol. The fat-free chromatin was then extracted with 0.9% of NaCl. The extract was then precipitated with acetone in which it was kept overnight. The clear supernatant solution had a bright yellow color. After decanting most of the acetone, the white precipitate was transferred aseptically to sterile test tubes in which it was lyophilized and sealed *in vacuo*. The 2.4 mg of dried material in each tube was taken up in 2 ml of saline for use on the rat wounds.

The wounds were made as described in the preceding paper. Controls were treated exactly as were the test animals, except that sterile saline was applied instead of the chromatin extract. With a hypodermic syringe, 2 or 3 drops were placed on the wound so that they formed one large drop filling the skin defect.† With a brush, a solution of methacrylate polymer in toluene was then applied over the drop and the adjacent normal skin. In the first 2 series of animals some of the wounds became infected. It was discovered that in these cases there had been leakage of the saline or test solution onto the normal skin so that the wound was not actually completely

* The work described in this paper was done under a contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and the University of California.

1 Marshak, A., and Walker, A. C., unpublished.

2 Claude, A., and Potter, J. S., *J. Exp. Med.*, 1943, **77**, 345.

† When the chromatin derivative was applied to wounds in which there was bleeding, the bleeding was stopped almost instantaneously.