cient amounts they were capable of immunizing guinea pigs. For experiments in concentration such suspensions were cleared of gross material by low-speed centrifugation and then run one and a half hours in a quantity ultracentrifuge[5] using a field of ca 60,000 g. Samples of the supernatant liquids, which were of high protein content, were reserved for tests of immunizing power; the rest was discarded. The large pellets found after ultracentrifugation were resuspended, and their solutions further purified by repetition of the cycle of low-speed centrifugation and ultracentrifugation.

Ultracentrifugal analytical examination of the final solutions has shown the sharply sedimenting boundaries of a molecular species with a sedimentation constant of the order of 60×10^{-13} cm sec.$^{-1}$ dynes^{-1}. In no instance was there to be seen any trace of the more rapidly sedimenting material that may be the infectious substance.[2]

The immunizing capacities of the supernatant fluids and of the final solutions have been tested by subcutaneous injection into 400-gram guinea pigs of two equal doses at an interval of one week, and by intracerebral injection of 100 to 500 minimal lethal doses of active virus two weeks after the second immunizing injection. Complete immunity has been conferred by small amounts of the final product, whereas the supernatant fluids have been devoid of immunizing capacity. In one experiment, for example, there was survival of three out of four guinea pigs receiving solutions containing a total of 0.2 mg. of protein. Two of these animals gave no reaction to 200 lethal doses of virus, the third became ill but promptly recovered. In another experiment in which the protein content of the protective injections was 0.25 mg each, three out of four animals survived 500 minimal lethal doses of active virus without rise in temperature or clinical manifestations of the disease. All guinea pigs injected with the corresponding supernatant fluids died in less than 72 hours. The results of other experiments have been similar. This work is being continued.

J. W. BEARD
HAROLD FINKELSTEIN
W. C. SEALY
DEPARTMENT OF SURGERY,
DUKE UNIVERSITY SCHOOL OF MEDICINE
RALPH W. G. WYCKOFF
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, PRINCETON, N. J.

VITAMIN B_1 REQUIREMENTS OF DIFFERENT STRAINS OF WHITE RATS

FROM the time the International Standard of vitamin B_1 was first adopted and made available, the conversion of Sherman Chase units of B_1 to International units has been a point of difference between laboratories. Conversion factors varying from two up to four or five have been reported. These variations have been tentatively explained on the basis of strain differences with the suspicion frequently that diet and technique might contribute largely to the results.

We have had the opportunity in the past two years of using three different strains of white rats in vitamin B_1 work, and have fed a number of groups on different levels of synthetic crystalline B_1. The results obtained with the three strains on a 2 gamma B_1 per day level, with two strains on a 4 gamma level, and one strain on an 8 gamma level, illustrate differences in three strains in their growth response to the feeding of vitamin B_1:

Strain	2 gamma fed daily Ave. gain in 5 weeks Gms.	4 gamma fed daily Ave. gain in 5 weeks Gms.	8 gamma fed daily Ave. gain in 5 weeks Gms.
A ...	33.3 ±1.9	52.8 ±2.3	....
B ...	14 ±1.64	27.6 ±1.04	52.9 ±2.8
C ...	29.8 ±3.38	....	....

These strain differences are inherent, as the young of the breeding stock of these three strains fed on the same stock ration give the characteristic response to B_1 supplements indicated in the table.

Variations in the factor for the conversion of Sherman Chase units to International units can be adequately explained by strain differences in the requirements of the test animals. It is obvious that each laboratory must determine its conversion factor for its particular strain of animals. It is suggested that the development of strains having uniform B_1 requirements is necessary if accurate results are to be obtained.

R. F. LIGHT
L. J. CRACAS
THE FLEISCHMANN LABORATORIES,
NEW YORK, N. Y.

THE EFFECT OF HUMIDITY ON THE DEVELOPMENTAL RATE OF CHICK EMBRYOS INCUBATED UNDER INCREASED ATMOSPHERIC PRESSURE

USING a slightly modified pressure incubator, originally described in SCIENCE,[1] a study was made of the effect of humidity on developmental rate of chick embryos during the first eleven days of incubation. Previous studies[2] had shown an acceleration of growth

[5] R. W. G. Wyckoff and J. B. Lagsdin, *Rev. Sci. Instruments*, 8: 74, 427, 1937.

[1] SCIENCE, 80: 99–100, 1934.
[2] *Jour. Elisha Mitchell Sci. Soc.*, 52: 269–273, 1936.