albumin from 2 dogs which we had supposed normal did not give a completely characteristic splitting, yet did not give the single band which the liver albumin from starved epinephrinized dogs showed. We have reason to believe from other evidence that these 2 dogs were not in a normal nutritional state.

11919 P

An Electrophoretically Homogeneous Component of Ragweed Producing Hay Fever.*

HAROLD A. ABRAMSON, D. H. MOORE AND H. H. GETTNER.

From the Electrophoresis Laboratory, Department of Physiology, College of Physicians and Surgeons, Columbia University, and the Laboratories, Mount Sinai Hospital, New York City.

It has been shown[1, 2] that in extracts of giant ragweed pollen there is a major component which is unpigmented and which moves slowly in the electrical field at pH 7.4 in phosphate buffer. In addition to this unpigmented, slow component (designated as USG) as many as 6 other components, probably pigments, were observed by means of the electrophoretic technic. These electrophoretic studies have now been extended to dwarf ragweed extract. Ultracentrifugal and diffusion data have also been obtained.

Figs. 1a and 1b represent the electrophoretic patterns obtained with crude giant and crude dwarf ragweed extract in M/6 phosphate buffer at pH 7.4. Note the similarity of the two sets of curves which were obtained with the Philpot-Svensson technic. The migration time was 2 hours. The base line on the right side of each of the figures has been obliterated. In both ascending and descending parts of the electrophoresis cell, the major component and pigments correspond fairly well. Not all of the pigments are shown.

The giant component† (USG) and the dwarf component† (USD) were isolated in the Tiselius cell and studied in the ultracentrifuge.

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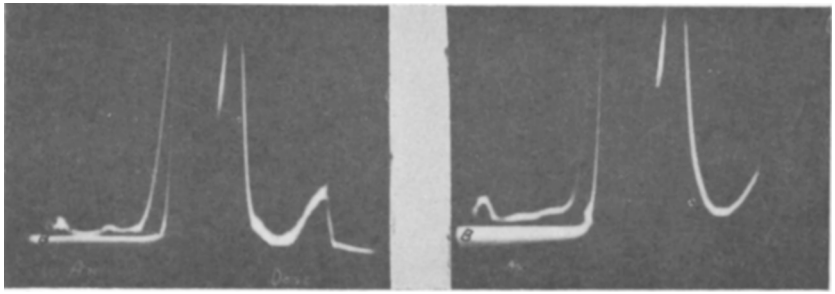
1 Abramson, H. A., Moore, D., Gettner, H., Gagarin, J., and Jennings, L., PROC. SOC. EXP. BIOL. AND MED., 1940, **44**, 311.

2 Abramson, H. A., and Moore, D. H., *J. Lab. and Clin. Med.*, 1940, **26**, 174.

† The names Trifidin and Artefolin are suggested for the USG and USD components respectively.



a b

FIG. 1.

Figs. 1a and 1b represent the electrophoretic patterns obtained with crude giant ragweed extract and crude dwarf ragweed extract in M/6 phosphate buffer at pH 7.4. Note the similarity in the two curves. The photographs (using the Philpot-Svensson technic) have been made after two hours of migration. In both ascending and descending parts of each of the figures, the major components and pigments are somewhat the same. The base lines have been removed on one side of each.

These colorless components were also found to be monodisperse in the ultracentrifuge and to have sedimentation constants of $1.5 \pm 0.2 \times 10^{-13}$ at room temperature. In addition, crude giant and dwarf extracts were ultracentrifuged. The sedimentation rate of the boundaries observed in the crude extracts corresponded very closely to the rate of the USG and USD components although some heterogeneity may have been present. However, with a force of about 150,000 times gravity much of the pigment remained in solution. The pigment intensity was apparently the same above and below the descending boundaries.

The USG component was sprayed into the nose in 15 hay fever cases and 7 normals. None of the normals reacted to the USG component. Nine out of the 15 cases of hay fever responded with symptoms varying from mild hay fever to severe hay fever and asthma.

The USD component is highly skin reactive (slight reaction on scratch test with a solution containing 0.0003 mg N/cc) and its reactivity is of the same order of magnitude as that of the USG component reported previously.

Preliminary data obtained for the diffusion constant of the USG component shows that it diffuses rapidly compared with a protein like serum albumin. The data thus far obtained at 2°C indicate that D is $1.7 \pm 0.5 \times 10^{-6}$ cm^2 per sec. The rapidity of diffusion and sedimentation indicates that the major colorless components have low molecular weights when compared with proteins. Indeed, the

calculation of the molecular weight using our values for the sedimentation and diffusion constants gives a molecular weight for the USG component of about 5000. This low value of the molecular weight fits in with the fact that biologically active material is readily introduced into the skin by electrophoresis.[3]

The low value of the molecular weight suggests that it may belong to a special group of allergenic substances of low molecular weight found in the pollens. The USG component gives a white precipitate with phosphotungstic acid, a Biuret reaction, and a Millon test. It is not coagulated by boiling. There was no precipitate with trichloracetic acid, nitric acid, or sulphosalicylic acid. (The Molisch test was negative.) The USG component is, therefore, not a protein. It is possible that its properties correspond with a very high molecular weight polypeptide or peptone. The solution tested contained 0.24 mg of nitrogen per cc.

The fast moving pigment and the pigment mixtures have not been investigated in detail but skin reactivity has been found in solutions of pigments presumably free of the USG and USD components. Passive transfer experiments are in progress.

Summary. Ultracentrifugal and diffusion studies of the major colorless components of both giant and dwarf ragweed extracts indicate that these major components are of fairly low molecular weight and do not have the ordinary chemical reactions of proteins. The low molecular weight which fits in with the high biological activity is in accord with the ability of these molecules to enter the mucous membranes, produce hay fever, and be transported into the skin by electrophoresis.

11920 P

Effects of Choline, Gelatin and Creatine on Perosis in Chicks.

THOMAS H. JUKES.

From the Division of Poultry Husbandry, University of California, Davis.

A basal diet consisting principally of glucose, casein and yeast was used[1, 2] for the production of choline deficiency in turkeys. The

[3] Abramson, H. A., *Science*, 1938, **87**, 299; Abramson, H. A., *N. Y. State J. Med.*, 1939, **39**, 1611; Abramson, H. A., and Gorin, M. H., *Cold Spring Harbor Symposia*, 1940, in press.

[1] Jukes, T. H., *J. Biol. Chem.*, 1940, **134**, 789.

[2] Jukes, T. H., *J. Nutrition*, 1940, **20**, 445.