arterial tension which it causes, cannot be determined from these experiments. This question of etiology must be settled by other methods of investigation. The chief value of the studies herein briefly summarized lies in the application of this comparatively simple series of changes to the more complicated vascular lesions occurring in the arteriosclerosis of man.

39 (85). **"On the chemical and physiological properties of ricin,"** with demonstrations: **THOMAS B. OSBORNE** and **LAFAYETTE B. MENDEL.**

A chemical study of the castor bean has indicated that this seed contains proteins of the same character as the other oil-seeds which have been examined, namely, (1) a considerable quantity of a globulin which can be obtained in octahedral crystals; (2) a much smaller quantity of an albumin, coagulating at about 60° C. to 70° C., the temperature at which it separates depending to a large extent on the rate of the heating and other conditions; (3) proteoses which appear to belong to several of the now recognized groups of this class of substances. The satisfactory separation of the various types of proteins was accomplished largely by the use of fractional salt precipitation and dialysis.

The toxic constituent of the castor bean has been investigated under Kobert's guidance by Stillmark, who applied the name *ricin* to protein material which he separated. The product which Stillmark regarded as relatively pure must have been a mixture of proteins and have contained only a small proportion of the toxic compound. Cushny made a more careful study of ricin and obtained a substance of sufficient toxicity to produce death in animals with a dose of 0.04 mg. per kilo of body-weight. He regarded the toxic compound as protein in nature. Among subsequent investigators, Jacoby has denied the protein character of ricin. He digested his toxic preparations with trypsin and obtained solutions which retained their toxicity although apparently no longer giving protein reactions. Brieger, however, failed to prepare toxic preparations free from protein material.

The efforts of the authors have been directed especially to the possibility of isolating the toxic constituent of the castor bean and determining its chemical nature. The toxic action has been found to be associated wholly with the preparations containing the coagu-

lable protein and never with those free from the *albumin* already mentioned. The toxicity of the products consisting chiefly of this albumin was extremely great, the most active preparation proving fatal when administered subcutaneously to rabbits in the small dose of 0.0005 mg. per kilo of body-weight. Each sample of ricin prepared by the authors showed in marked degree characteristic agglutinating properties in its behavior toward erythrocytes; and the pathological findings after intoxication were typical. The other proteins of the seed are devoid of the properties noted for ricin, thus demonstrating the applicability of the methods of separation employed. The toxicity of the active preparations is proportional to the content of coagulable albumin, the purest specimens containing, as their analysis shows, little else than protein. Thus far their determinations have shown that the ricin prepared by the authors does not differ from ordinary proteins in composition, heat coagulation, color reactions, precipitation reactions, specific rotation, or in the state of combination of its nitrogen. By tryptic digestion the agglutinating power and toxicity of pure ricin may be greatly impaired or destroyed. The experience of the authors lends no encouragement to the attempts to "purify" such toxins by methods designed to eliminate protein substances from the active materials.

40 (86). "**On a method of determining indol,**" with demonstrations: **C. A. HERTER** and **M. LOUISE FOSTER.**

The method described by the authors constitutes a rapid and accurate means of determining indol. It is based on the fact that indol, in slightly alkaline solution, readily condenses with naphthoquinon sodium mono-sulfonate, and forms a blue crystalline compound which is only very slightly soluble in water and is readily extracted by chloroform from a watery solution or suspension. The condensation compound results from the union of two molecules of indol with one of the naphthoquinon compound. The union does not occur as in the case of compounds with amins, with the elimination of the sulfonic acid group, but occurs between one of the carbonyl groups of the naphthoquinon compound and the imid group of the indol. The new compound is, therefore, a di-indyl naphtho-ketone mono-sulfonate. The solubility of this substance in chloroform is about one part in 4,000 of the solvent, and is suffi-