of a 1-2% solution of the digested material* and about 1 cc. of a 0.2% solution of globulin, while the respective values for the animals sensitized with globulin were about 4% and 0.0125%. In another batch of animals this difference was still definite but less considerable. But, after precipitating a 5% solution of the digestion product with an equal volume of 10% trichloracetic acid and precipitating the supernatant fluid with alcohol the resulting substance was much more toxic for the guinea pigs sensitized with the digested material (lethal dose 0.5%) than for those sensitized with globulin (lethal dose 4% or more). Similar results were obtained by sensitizing with digested heat-coagulated egg globulin. These animals were killed by an *i. v.* injection of 1 cc. of 0.25% to 0.125% of the digestion product after fractionation with trichloracetic acid and by 1 cc. of a 0.1% solution of unchanged globulin.

In some cases, but irregularly, the animals sensitized with peptic products succumbed to injections of 1% ovomucoid. This substance, however, can hardly be essential for the results reported since digested products of heat-coagulated globulin were more active in producing shock than those of non-coagulated globulin in animals sensitized with digestion products of the latter preparation, and also on account of the results of experiments with guinea pigs sensitized with ovomucoid itself.

4002

Estimation of the Acid Combining Capacity of a Protein by Means of the Interferometer.

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The index of refraction of a mixed solution of gelatin and of hydrochloric acid as measured by an immersion refractometer has been stated to be an additive function of the indices of refraction of the individual solutions.[1] Using the Zeiss-Löwe interferometer, which is a differential refractometer capable of measuring small changes in refractive index to which an immersion refractometer is insensitive, the authors have found that the refractive indices of mixed solutions of gelatin and of hydrochloric acid are not additive.

* The lethal dose of a digestion product obtained from heat-coagulated egg globulin was 1 cc. of a 0.3 to 0.2% solution.

[1] Walpole, G. S., *Kolloid Z.*, 1913, xiii, 241.

TABLE I.
(0.881 gm.* of ash-free gelatin and varying proportions of 0.1004 Normal Hydrochloric Acid in 200 cc. total volume.)

cc. of acid added	Interferometer reading (Average of 5 determinations)
0	1870
1	1875
2	1881
3	1886
4	1891
6	1902
8	1914
10	1934
15	1985
20	2036

* Absolute, water-free basis.

However, the refraction of mixed solutions of gelatin chloride and of hydrochloric acid are additive. Consequently, when a solution of gelatin is titrated with an acid, an abrupt change in slope of the curve (refraction as function of acid added) is noted at the

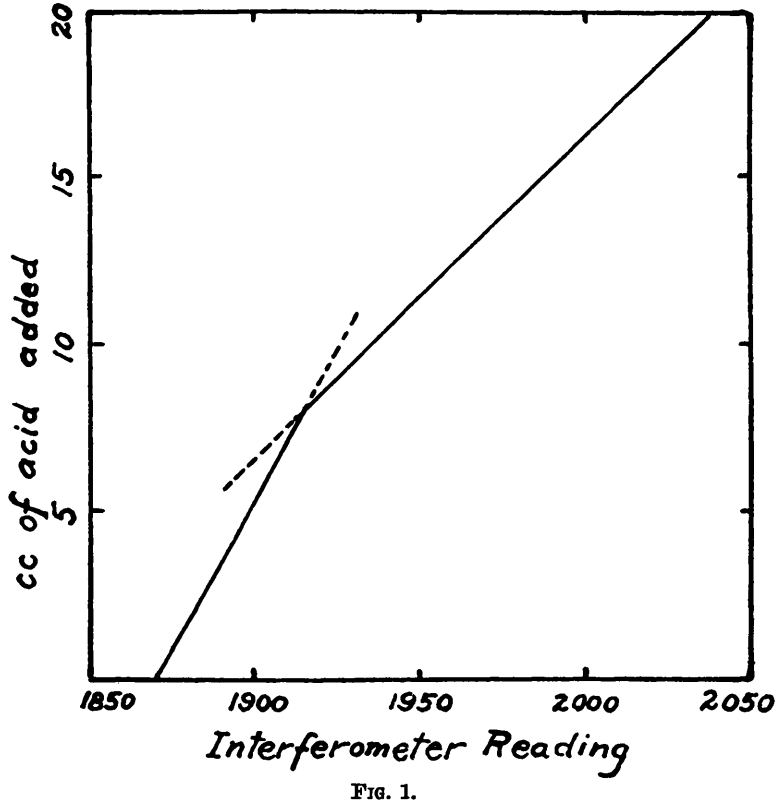

FIG. 1.

stoichiometric point. The authors have found this to be the case also when an amino acid is similarly titrated, and recently the interferometer method of following simple acid-base neutralizations has been reported elsewhere.[2]

The data for a gelatin titration are given in Table I and are shown graphically in Figure I. The gelatin used was a pure specimen obtained from the Eastman Kodak Company. Its ash content was 0.03%.

The 2 branches of the curve intersect at the point equal to about 7.9 cc. of acid. Consequently the equivalent weight of this specimen of gelatin is about 1111. For the benefit of the reader interested in a description of the instrument used by the authors, the excellent paper of Adams[3] is recommended.

4003

Rickets in Rats. VI.* Effect of Phosphate Added to the Diet of Non-Ricketic Rats.

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Phosphate added to the diet causes rapid healing of rats made ricketic on a high calcium-low phosphorus regimen which has not been irradiated and is poor in vitamin D. This is evidenced by histological sections of the bones, blood serum analyses, bone analyses and studies of the metabolism of calcium and phosphorus.[1] As a result of the alteration in diet not only is the rickets cured but a transient tetany is also produced. The blood serum phosphate becomes extremely high—the calcium low. If the animals survive the tetany the blood serum calcium and phosphorus return to values considered normal in 2 weeks. Similarly, the feeding of phosphate to normal dogs is known to produce tetany (Salvesen, Hastings and McIntosh[2]).

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[2] Berl, E., and Ranis, L., *Berichte* (B), 1928, lxi, 92.

[3] Adams, L. H., *J. Am. Chem. Soc.*, 1915, xxxvii, 1181.

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[1] Karelitz, S., and Shohl, A. T., *J. Biol. Chem.*, 1927, lxxiii, 665.

[2] Salvesen, H. A., Hastings, A. B., and McIntosh, J. F., *J. Biol. Chem.*, 1924, lx, 311.