without losing any of the accuracy of the original, is much more convenient because it can be used an indefinite number of times without disconnecting the parts, and the shaking by hand is replaced by the less laborious and more efficient motor. The latter also increases the rapidity, so that with one apparatus a determination can be made every seven or eight minutes.

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The nature of the free amino groups in the native proteins.

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The fact that at least some proteins contain a small but definite proportion of their nitrogen in the form of free amino groups capable of reacting with nitrous acid has been proven by one of us. Levites and Skraup failed to obtain lysine from proteins which had been treated with nitrous acid before hydrolysis. This indicates that the ω-NH_2 group of lysine, $\mathbf{NH_2}\cdot(CH_2)_4\cdot CH_2(NH_2)$-COOH, may be free in the protein molecule. As lysine is peculiar among the amino acids in possessing an ω-NH_2 group, it appeared possible that this might be responsible for all or most of the amino nitrogen determined. We have, therefore, determined the free amino nitrogen in ten proteins in which the lysine has already been quantitatively determined in either our laboratory or in Osborne's.

Protein.	Per Cent. of Total N in Lysine.	½ Lysine N.	Free Amino N.
Ox-hemoglobin	12.0 (Van Slyke)	6.0	5.6
Fibrin	11.4 (Van Slyke)	5.7	5.3
Hemocyanin	8.5 (Van Slyke)	4.25	4.3
Casein	6.9 (Osborne)	3.45	3.4
Gelatin	6.3 (Van Slyke)	3.15	3.1
Egg albumin	4.0 (Osborne)	2.0	2.4
Edestin	3.8 (Van Slyke)	1.9	1.2
Zein	0.0 (Osborne)	0.0	0.3
Albumoses from Witte Pepton.			
Heteroalbumose	10.3	5.15	6.3
Protoalbumose	9.6	4.8	6.6

Without exception the free amino N of the native proteins

equals within a fraction of a per cent. that of the ω-group of the lysine. It appears that the ω-group of lysine constitutes practically all of the free amino nitrogen of the native proteins determinable with nitrous acid. The albumoses show appreciably more free amino nitrogen, which is to be expected from the fact that the protein molecule is partially broken down in their preparation.

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An experimental study of anti-anaphylaxis.

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If a guinea-pig be given a single injection of a foreign proteid, it becomes, after the lapse of 10 to 14 days, actively sensitized to that proteid, in such wise that the reinjection of the same, in doses far too small to cause any symptoms in a normal animal, produces almost immediate death with convulsions. If, however, such a sensitized pig, after the sensitizing injection, be given a second dose, too small to induce its death, it immediately passes into a condition of anti-anaphylaxis, in which it is refractory to the foreign proteid in question, and may manifest no symptoms even after the injection of doses toxic to normal animals. This refractory stage lasts for weeks or months. In the same way, an animal may be passively sensitized by the introduction into its veins or peritoneum of the serum of another animal, which has been previously immunized or sensitized to a foreign proteid; in this case, too, the injection of a relatively small, *i. e.*, sublethal, dose of the same proteid into the passively sensitized animal produces a condition of anti-anaphylaxis.

By no experimental device hitherto employed has it been possible to alter this condition of anti-anaphylaxis. The theories offered to explain it are numerous. Friedemann, in his general review of anaphylaxis, in 1911, cites three hypotheses, those of Gay and Southard, of Besredka, and of Friedberger, all of which he proves to be untenable, and offers three other possible explana-