is, next to proteid, the most widely distributed substance in the animal organism. As Hammarsten has well said, "it has been found wherever it has been looked for." Whenever I have stated that lecithin is present in any fibrinogen, I have prepared it and tested for it in the way I have previously repeatedly described in the papers Dr. Halliburton quotes.

IV. The criticisms which Dr. Halliburton passes upon my discovery that tissue fibrinogens cause intravascular clotting when injected into the living circulation, can hardly be regarded seriously; for he asserts that the tissue fibrinogen is a slimy mass, and causes clotting by mechanically plugging the vessels, whereas if he had repeated my experiments he would have found (1) that the fibrinogen is not at all slimy, and (2) that it can hardly be supposed to cause clotting mechanically, since it passes through the right heart, then the capillaries of the lungs, next the left heart and aorta, and finally the capillaries of the alimentary canal before it first causes clotting, *i.e.*, in the portal vein in the dog.

IV. "Note on the Volumetric Determination of Uric Acid." By A. M. Gossage, B.A., Oxon. Communicated by Professor J. Burdon Sanderson, F.R.S. Received May 29, 1888.

Dr. Haycraft has recently proposed a method for the volumetric determination of uric acid in urine ('Brit. Med. Journ.,' 1885, 2, p. 1100) which has great advantages over all former methods in that it is much quicker and easier to manage. The uric acid from 25 c.c. of urine is precipitated by silver nitrate after previous addition of sodium carbonate (to prevent reduction) and ammonia (to dissolve silver chloride, &c.); this precipitate is then collected, washed, and dissolved in nitric acid, and the amount of silver present in this solution ascertained by Volhard's method, *i.e.*, titration with ammonium sulphocyanate; from this the amount of uric acid can be calculated. "In order to test the accuracy of the process," he says, "I prepared several solutions of acid urate of sodium of known strength. To these I added various quantities of common salt, magnesium sulphate, and phosphate of soda in order to imitate as far as possible the urinary secretion. On estimating the uric acid in these solutions, I obtained wonderfully correct results. In all cases not much more than a milligramme was lost during the process, and may be simply accounted for by the fact that no salt of uric acid is absolutely insoluble. . . . . In order further to test its accuracy, 50 c.c. of urine were divided into two equal portions; to the first 25 c.c. of a solution of acid urate of sodium of known strength were added; to

the second 25 c.c. of water were added. When estimated the two fluids should show a difference equal to the quantity of salt added." Results very closely corresponding to this were obtained.

These results do not agree with results obtained by Salkowski (Pflüger's 'Archiv,' vol. 5, 1872, p. 210) and Maly (Pflüger's 'Archiv,' vol. 6, p. 201). Salkowski proposed a volumetric method for the determination of uric acid, very similar to that proposed by Dr. Haycraft; in this he added excess of silver nitrate and estimated the excess of silver present. He gave up this method, however, as on examining the silver precipitate obtained from urine, after complete precipitation of the phosphates by magnesia mixture, he found that it contained magnesium as well as silver, and that the proportion of magnesium to silver varied considerably in precipitates from different urines, though constant for the same urine. Haycraft considers that the presence and variation in amount of magnesium in these precipitates may be due to varying quantities of magnesium ammonium phosphate in them. This is, however, impossible, as the phosphates were precipitated by Salkowski previously, and the urine allowed to stand for twenty-four hours before filtration to ensure their complete separation. Salkowski's results were confirmed by Maly, who found that if in the presence of salts of calcium, magnesium, potassium, and ammonium, a solution of a urate be precipitated by silver nitrate, the precipitate contains these metals as urates as well as silver urate.

As a test of the accuracy of Haycraft's method, I examined samples of various urines both by his method and by Salkowski's method, which is universally acknowledged to be the most reliable, and the accuracy of which has been proved by experimental evidence. This method consists in taking 250 c.c. of urine, adding 50 c.c. of magnesia mixture to precipitate phosphates, and then adding to 240 c.c. of the filtrate (which are equivalent to 200 c.c. of the urine) silver nitrate to precipitate the uric acid. This precipitate of silver urate is decomposed by sulphuretted hydrogen after being suspended in water. The liquid is then acidified, filtered hot, and evaporated to small bulk, and the uric acid allowed to crystallise out. These crystals are then dried and weighed. The following results were obtained:—

1 c.c. NH_4CNS = 0·00168 Uric Acid.

Expt.	Salkowski (200 c.c. urine).		Haycraft (25 c.c. urine).		
	Quantity of uric acid obtained.	Mean percentage.	No. of c.c. of NH_4CNS required.	Mean equivalent quantity of uric acid.	Percentage.
I.	0·168 gr.	0·084	(*a.*) 16·2 c.c. (*b.*) 16·3 „	0·027	0·108
II.	0·07 gr.	0·035	(*a.*) 11·8 c.c. (*b.*) 11·4 „ (*c.*) 11·0 „	0·019	0·076
III.	(*a.*) 0·098 gr. (*b.*) 0·1045 „	0·051	(*a.*) 12·3 c.c. (*b.*) 12·1 „	0·0205	0·082
IV.	(*a.*) 0·068 gr. (*b.*) 0·073 „	0·035	(*a.*) 10·7 c.c. (*b.*) 11·1 „	0·018	0·072
V.	(*a.*) 0·154 gr. (*b.*) 0·160 „ (*c.*) 0·165 „	0·08	(*a.*) 16·3 c.c. (*b.*) 16·4 „	0·027	0·108

The results obtained by Haycraft's method were always considerably higher than those obtained by Salkowski's. The reason of this is that Dr. Haycraft has assumed that the silver precipitate from urine consists of an urate containing only 1 atom of silver in the molecule, whereas the proportion of silver in this precipitate is always larger, and varies in amount in different urines. If we assume that the precipitate contains 2 atoms of silver in a molecule of urate and divide the results obtained by Haycraft's method by two, we see that in two cases they are about equal to, in the rest less than those obtained by Salkowski's method. The proportion of the results obtained by one method to those obtained by the other varies. This agrees with the results of Salkowski's researches, from which one would expect that the results obtained by Haycraft's method would not bear a constant relation to the results obtained by Salkowski's, and that the halves of the results by the former method would be lower than, in most cases, those obtained by the latter.