VI.. "Experimental Researches on Spontaneous Generation." By Gilbert W. Child, M.D. Oxon. Communicated by Professor Phillips. Received May 26, 1864.

(Abstract.)

The experiments are twenty in number, and were performed during the summer of 1863. The substances used were in ten experiments milk, and in ten, fragments of meat and water. These were in all cases placed in a bulb of glass about $2\frac{1}{2}$ inches in diameter, and having two narrow and long necks. The experiments are divided into five series of four experiments each. In one series the bulbs were filled with air previously passed through a porcelain tube containing fragments of pumice-stone and heated to vivid redness in a furnace. In the others they were filled respectively with carbonic acid, hydrogen, oxygen, and nitrogen gases. In each series two experiments were made with milk, and two with meat; and each substance was boiled in one case, and not boiled in the other. The joints of the apparatus were formed either by means of non-vulcanized caoutchouc tubing, or india-rubber corks previously boiled in a solution of potash; and in every case, at the end of the experiment, the necks of the bulb were sealed by the lamp. The time of boiling such of the substances as were boiled varied from five to twenty minutes, and the boiling took place in the bulbs, and with the stream of gas or air still passing through. The substances were always allowed to cool in the same stream of gas before the bulbs were sealed. The microscopic examination of the contents of the bulbs took place at various times, from three to four months after their enclosure.

In every case but one in which the substance had not been boiled low organisms were found, apparently irrespective of the kind of gas in which they had to exist. The case in which they were not seen was that of the meat enclosed in a bulb filled with nitrogen. This bulb burst apparently spontaneously, and its doing so may be looked upon as a proof that in it also some change had taken place most likely connected with the development of organic life. Where the substances had been boiled, the results were as follows:—

1. In the carbonic acid experiments, no sign of life.
2. In the hydrogen experiments, no sign of life.
3. In the heated air experiments, organisms found in both cases.
4. In the oxygen experiments, organisms found in the experiments with milk. The bulb containing the oxygen and meat burst spontaneously, therefore probably contained organisms.
5. In the nitrogen experiments, organisms were found where meat was used. None where milk was used.

No definite conclusion can be drawn from so limited a range of experiments; but it is worthy of remark that organisms were found here under the precise circumstances in which M. Pasteur states that they cannot and

do not exist. The very abnormal conditions under which some of these so-called organisms are found, would render it doubtful whether Bacteriums, Vibrios, &c., ought to be considered as independent organisms in any higher sense than are white blood-corpuscles, pollen-grains, mucus-corpuscles, or spermatozoa.

VII. "On a Colloid Acid, a Normal Constituent of Human Urine." By William Marcet, M.D., F.R.S. Received May 28, 1864. (Abstract.)

The object of the present communication is to describe the mode of extraction and the properties of an acid of a colloid nature which is always present in healthy human urine, and appears destined to become of great importance in Physiological Chemistry.

With the view of separating this acid from the urinary secretion, the fluid is mixed with animal charcoal, concentrated, and filtered, and the filtrate, after precipitation with baryta-water, is dialyzed for about twenty-four hours. The dialyzed liquid, after subsequent filtration and concentration, is mixed with basic acetate of lead, which precipitates the colloid acid as an insoluble lead-salt, along with a little hydrochloric acid and other impurities. The precipitate should be thoroughly washed, decomposed with sulphuretted hydrogen, and again treated with animal charcoal. When the acid is required in a pure state, the hydrochloric acid present is removed with carbonate of silver, the excess of the silver precipitated with sulphuretted hydrogen, and, after boiling to evolve this last substance, basic acetate of lead is again added. The lead-salt perfectly washed may be considered pure, and the pure acid can be obtained from it by decomposition with sulphuretted hydrogen.

The acid is very slow to decompose when exposed to the air. It may be considered to undergo no loss or decomposition by being boiled, as shown by direct experiment. After concentration by heat, its colour darkens and it becomes syrupy, possessing a sharp acid taste, with a slight acrid and astringent after-taste; the taste is perceptible in the solution when very dilute: no crystals of the acid could be obtained in the syrup. Dried at a temperature under 212° F., the acid has the appearance of a transparent varnish; it is very hygroscopic, and dissolves readily in water, though not apparently in alcohol (sp. gr. ·820) or in ether. When burnt, the colloid acid chars, emitting a pungent and irritating smell, and after complete combustion, nothing but the minutest trace of inorganic residue remains. Although strictly a colloid, this acid in the free state passes through a dialyzer, but not so readily as a crystalloid. When under the form of a compound, its property of dialyzing appears much diminished. I could not find that it exerted any action on polarized light*.

* This acid does not precipitate egg-albumen. It precipitates casein, but an excess does not appear to redissolve the precipitate as in the case of acetic acid.