NOTE UPON BUTSCHLI'S EXPERIMENTAL IMITATION OF PROTOPLASM.

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During the past few years Prof. Bütschli, of Heidelberg, has made many attempts, and now succeeds in producing under the microscope seemingly amœboid movements. He has communicated to Prof. Ray Lancaster, of England, a full account of his methods by which he attempts to imitate protoplasm. A medium sized watch glass or flat dish must be filled with a thin layer of common olive oil and be placed on a water bath or small cupboard at a temperature of about 50° C. The great point is to select the right moment at which the oil attains the proper degree of thickness and viscosity; this moment can, however, only be found by systematic trials. After three or four days a trial may be made. Should the drop not have become finely vesiculate and exhibit little or no streaming, the heating process must be continued and a trial made on the succeeding day. If the oil becomes too thick it will form frothy drops, and in such cases a small quantity of ordinary olive oil must be mixed with it.

The vesiculate drops are thus prepared: In a small agate mortar a small quantity of dry carbonate of potash is ground to a fine powder. This is breathed on till the salt becomes slightly moist, and then a drop of oil must be added; the two constituents should be mixed until they form a thickish paste. A few drops of this paste, about the size of a pin's head or smaller, are placed on a cover glass, the corners of which are supported by pegs of soft paraffin. Then a drop of water is placed on a slide and the cover glass is put over it in such a manner that the drops of paste

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are immersed in the water, but are not much compressed. The preparation is then placed in a damp chamber, and remains there about twenty-four hours, when the drops have a milk white and opaque appearance. The preparation is then well washed out with water, which is supplied at one edge by a capillary tube and drawn out by blotting paper at another.

If the drops have turned out well they will begin almost at once to move about rapidly and change their shape continuously. The water under the cover glass must now be displaced by glycerine diluted with an equal bulk of water, when a vigorous streaming movement will be exhibited. The amœboid movements are generally more distinct if the drops are somewhat compressed. If the drops do not stream they can be generally made to do so by slightly tapping the cover glass, by applying gentle pressure, or sometimes by breaking up the drops. It is especially interesting to see how fast and beautifully the drops creep to and fro in the water or half diluted glycerine, even when they are not compressed. The streaming movement on the other hand is better seen if the drops are somewhat compressed ; this may be done by inserting under the cover glass a piece of broken cover glass of medium thickness, and then removing the paraffin pegs. This streaming movement is best demonstrated twenty-four hours after the addition of the glycerine, as the drops will then be thoroughly cleared and transparent. The movement and streaming are much more marked and distinct if the drops are examined on a stage warmed to 50° C. Prof. Bütschli advises repeated trials if the first experiments prove unsuccessful. Saponification, and vibratory movements inseparable from all inhabited spots, do not offer satisfactory solutions, and I take the liberty of asking the members of the Society for some little discussion regarding the probable causes concerned.