the unknown signification of the latter it is, to be sure, quite uncertain whether there must exist a minimum limit beneath which the possibility of life is totally excluded; but as this limit does certainly exist for the facultatives, one is by analogy inclined to accept its existence everywhere, consequently for the obligatous anaërobics, too. That is, for them also, to recognise free oxygen as a necessity for existence.

This opinion has the more weight now that it has been proved how easily may be shown that they not only *use* free oxygen but if possible, *seek* it and that it may promote even such important functions as growth and mobility.

Without doubt, this points to something more than „use", albeit the term „want" goes perhaps too far. As it is however a fact that the obligatous anaerobics can produce thousands of new generations without a renewed contact with free oxygen, the hypothesis demands the acceptance of a peculiar exciting action of the free oxygen, stored up as a provision in the body of the bacteria.

This action cannot be compared to that of kalium, or of magnesium, or of the other elements necessary for life in small quantities. In the first place, because the latter must be present in quantities of another order, quantities gigantic compared to that of the oxygen provision; secondly and especially, because these elements may be withdrawn from the most different chemical compounds. The very necessity of the oxygen being free, causes the difficulty of giving a definite representation of its function. Some light would go up if it could be proved, that in the food a loosely bound form of oxygen might occur, accessible to the anaerobics, and PASTEUR has indeed supposed that the oxygen, which is found in beer wort, and cannot be separated from it by pomping or boiling, makes the anaerobiosis of beer yeast possible.

Facts are however not in accordance with this hypothesis. Now, as in the case of beer yeast and the other facultative anaerobics, we are obliged to admit the existence of a store of free oxygen in the cell itself, which, in a way hitherto unexplained, makes a temporary anaërobiosis possible, analogy, supported by the observations here described, leads to the same conclusion for the obligatous anaerobics.

Physiology. — *On the influence of solutions of salts on the volume of animalcells, being at the same time a contribution to our knowledge of their structure.* By Dr. H. J. HAMBURGER.

(Will be published in the Proceedings of the next meeting).

Physics. — „*On an asymmetry in the change of the spectral lines of iron, radiating in a magnetic field*". By Dr. P. ZEEMAN. (Will be published in the Proceedings of the next meeting).

Physics. — *The* HALL-*effect in electrolytes.* By Dr. E. VAN EVERDINGEN JR. (Communication N°. 41 from the Physical Laboratory at Leiden, by Prof. H. KAMERLINGH ONNES).

1. The researches on the HALL-effect and the increase of resistance in the magnetic field for bismuth, communicated to the Academy in the Meetings of 30 May 1896, 21 April and 26 June 1897 [1]), and afterwards treated more at large in my dissertation, induced me to put the question, whether these phenomena may justify a choice among various theories about the nature of the electric current and the resistance of metals. A first step towards answering this question was the deduction of a formula for the HALL-effect in electrolytes, with the aid of simplifying suppositions. Indeed it is generally assumed that in electrolytes the electric current consists in a convection of charges by the ions; the velocities of this motion are known in many cases, hence all the data for the calculation are present. This research, already begun in Chapter VIII of my dissertation, being concluded for the present, I wish here briefly to communicate the results.

2. Several physicists have tried to observe the HALL effect in liquids. They succeeded indeed in observing differences of potential, caused by a magnetic field in solutions of sulphate of zinc and copper which were traversed by currents, and changing their signs on the reversal of the magnetic field or of the current. Whereas however in most metals the HALL-effect is proportional as well to the strength of the current as to the field, and in all metals the difference of potential appears immediately on closing the magnetizing current, in the liquids this difference increases more than the current and less than the magnetic field, and after the applying of the field it grows slowly towards a maximum. Chiefly on account of the last named fact ROITI [2]), FLORIO [3]) and CHIAVASSA [4]) refused to acknowledge the differences of potential observed also by themselves as

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[1]) Communications from the Phys. Lab at the Univ of Leiden. N°. 26, 37 and 40.

[2]) Atti della R. Acc. dei Lincei 12 p 397, 1882; Journ. de Phys. 1883.

[3]) Il nuovo Cimento, Ser. 4, T. 4, p. 106, 1896.

[4]) Elettricista 6, 1897.