fuller's earth treated with 15,000 cc. of the urine filtrate from the above activated earth, but continued to grow worse.

4. Three pigeons with acute symptoms of polyneuritis improved after treatment with fuller's earth, activated with 400 to 1325 cc. of fresh filtered human saliva. Simple preventive tests with saliva were negative.

5. Four "control" pigeons, which acquired the acute symptoms of polyneuritis on a diet of polished rice along with the others above, were not treated. All grew worse, 3 dying within a day.

Conclusions.

1. These experiments indicate that the antineuritic vitamine is probably present in comparatively small quantity in clean, fresh, filtered bile from the bladder of the ox.

2. This food accessory is also present in fresh filtered human urine in traces apparently.

ATLANTA, GEORGIA.

NOTE.

Fischer's Theory of Water Absorption in Edema.[1]—Professor Henderson has again called attention, in a recent number of THIS JOURNAL,[2] to the fundamental requirements which Fischer's theory of water absorption by protoplasm[3] fails to satisfy, or even to consider. Emphasis is justly laid upon the fact that no significant swelling of the protein blocks used by Fischer has been shown to occur within the range of acidities possible in the body fluids of living mammals.[2] It might be answered, although the point seems not to have been closely considered, that within the cell acidities may prevail different from those known in blood, cerebrospinal fluid, and similar juices. There is reason to suppose that the reaction of intracellular fluids is, as a rule, less alkaline than that of blood, but the basis for this belief has not been extensive. Without venturing to add unduly to the already voluminous discussion of the "colloid-chemical" theory of water metabolism, attention may, nevertheless, be called to some evidence regarding the range of intracellular acidities obtaining in the living tissues of animals.

This evidence is derived from cases in which pigments capable of behaving as sensitive indicators of acidity have been found within the cells of certain marine invertebrates.[4] The hydrogen-ion concentrations at which these indicators change color were determined by appropriate

[1] Contributions from the Bermuda Biological Station for Research, No. 94.

[2] Henderson and Cohn, THIS JOURNAL, 40, 857 (1918); Henderson, Palmer and Newburgh, *J. Pharmacol.*, 5, 449 (1914).

[3] "Edema and Nephritis," 2nd Ed., New York, 1915; Fischer and Hooker, THIS JOURNAL, 40, 272 (1918).

[4] Crozier, *J. Biol. Chem.*, 24, 255, 443 (1916); 35, 455 (1918).

methods,[1] and it was found that the corresponding intracellular acidities, in the tissues of 3 species of sponges, one echinoderm, and a nudibranch mollusk, apparently must lie within the limits 5.6–8.0 (P_H); the actual range is probably narrower than this. The intracellular reactions in the different tissues are probably not all identical. In the case of the nudibranch *Chromodoris*,[1] containing integumentary pigment particularly sensitive over the physiological range, the intracellular acidity (of the fluids associated with the pigment) appears to vary from <6.0 to >7.0 (P_H). In every instance, however, the intracellular reaction is more acid than that of the sea-water medium ($P_H = 8.05$–8.15), and perhaps more acid than that of the blood. These acidities, however, all lie within the limits of non-significant protein swelling.[2]

Individuals of the nudibranch *Chromodoris* undergo natural death after having attained a length of about 16 cms.; during this death process the integumentary tissues containing the intracellular indicator become more acid ($P_H < 5.6$), and seem to undergo a certain amount of swelling ("edema"); *these individuals do not recover, but invariably die.* Quantitative estimations of the amount of tissue swelling are difficult, for technical reasons (owing to the presence of macroscopic, fluid-containing, extracellular spaces), but this amount seems to be relatively small.

These observations consequently increase the difficulties in the way of accepting Fischer's conception of water metabolism, since they indicate a range of intracellular acidities, in animal tissues, within which it is known that no significant protein swelling occurs, and since they show that an intracellular acidity even remotely approaching that at which significant swelling might be possible is irreversibly associated with natural death. The importance of these observations lies in the fact that direct investigation of intracellular acidities is least liable to error when based upon the behavior of appropriate pigments of natural occurrence.

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CORRECTIONS.

On page 1259 of the August number the reference to Abegg's *Anorganische Chem.* in the fourth line from the bottom of the page should be omitted.

On the Quinone-Phenolate Theory of Indicators.—On account of failure to read page proof for the article in the July number of THIS JOURNAL for this year, we have published a number of proof-errors which are obvious to anyone following the work closely, but which should be corrected as a matter of record. In discussing the application of the idea advanced in 1907 that a dibasic acid has *two* primary

[1] Crozier, *Loc. cit.*

[2] *J. Pharmacol.*, 5, 449 (1914).