into methemoglobin and thus is no longer active as a physiological oxygen carrier. In view of these considerations we suggest that glutathione is one part of the mechanism which prevents the accumulation of methemoglobin in the intact erythrocyte.

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THE CRYSTALLINE CHARACTER OF LIVING MATERIAL

THE notice in SCIENCE for August 13, 1937, Supplement, page 6, outlining Dr. George A. Baitsell's conclusions concerning the crystalline character of living material is interesting. Dr. Baitsell's work is specially significant from two angles. Firstly, because his conclusions are based upon x-ray investigations; and secondly, because his conclusions can be correlated with similar findings by several workers in the past who used data mostly obtained by microscopic methods. The very close relationship between crystallinity and living structures was realized and extensively advocated by the German scientists, Otto Lehmann, Ernst Haeckel and Friedrich Rinne. The main contention of Rinne's work, "Grenzfragen des Lebens" (1931), is upon the fundamental similarity of crystalline material and organic structure. Rinne in his book also insisted upon the continuity of the organic with the inorganic world.

The writer, in a paper entitled "Iron as the Original Basis of Protoplasm" (1935), shows that the iron bacterium *Leptothrix ochracea* is crystalline. He also summarizes observations on the double refraction of plant cell-wall material, the geometric outline of plant cells and the double refraction of certain chromosomes as general indications of the crystalline character of cellular material. The writer concludes that there are four fundamental factors in the generation of life, and one of these is the aggregation and crystallization of an iron compound, ferrous hydroxide.

On a general basis, all these relationships between crystalline and morphological phenomena can be reduced to the conceptions of modern atomic physics. R. Fuerth, of Prague, especially, has applied physical conceptions to structures and functions of organisms (*Die Naturwissenschaften,* 16: 777, 1928). On this basis, not only organic structures but organic functions are reduced to electromagnetic fields.

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POLLEN AND HAY-FEVER

WHILE the recognition of pollen as the cause of hay-fever is general, apparently the behavior of the inhaled pollen does not seem to be clearly understood. At any rate, when I asked for information on this subject from medical men, who I took for granted could give me the desired data, I was rather taken aback when I was told they could give me no references bearing on this subject. Further questioning brought out the admission that they had never thought of the pollen grain as a living thing, comparable to bacteria or other pathogenic organisms.

When it was first shown that pollen was responsible for the symptoms of hay-fever, it at once seemed to me that the inhaled pollen spores might very probably find the moist mucous membranes a favorable medium for germination. The rapid germination, accompanied by the excretion of enzymes associated with the penetration of the tissue of the host by the pollen tube, would presumably immediately set up the characteristic irritation of the mucous membrane, and through the pollen tube the proteins of the pollen spore would be discharged into the tissue of the host.

The germination of pollen is a routine experiment in the botanical laboratory, where in an ordinary sugar solution of about ten per cent. many species will germinate promptly, the protrusion of the pollen tube sometimes occurring within a few minutes.

Assuming that the above theory is correct, it may be inferred that the pollen grains falling on the moist mucous membrane of the nasal passages might in a few minutes send out the pollen tube, exactly as a fungus spore germinates, and quickly initiate the characteristic symptoms of the disease.

The demonstration of the presence or absence of germinating pollen should not be a difficult matter and, if germination does occur, it certainly should offer a wide field for experiment.

It seems hardly possible that experiments along these lines have not been made, and I should very much appreciate any information on the subject.

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QUOTATIONS

SCIENCE'S MAGNA CHARTA

IT took the British Association for the Advancement of Science a decade to realize that a biologist, a physicist or chemist is not an anchorite of the laboratory but a responsible member of society. The realization bore fruit at the historic Blackpool meeting of 1936. There English men of science awakened socially. Possibly the present Indianapolis meeting of the American Association may be equally significant. A symposium on "Science and Society" will give our