number of spines. Later the scales grow still smaller, becoming like shagreen; bony plates appear, while the spinous dorsal, ventral fins and the gill openings undergo reductions. Later the spinous dorsal and the ventrals disappear altogether, the teeth coalesce into two in each jaw and finally into one in each jaw; this series finding its extreme in the head-fish (*Mola*), in which the body is deeper than long and seems to be simply a great head with a fin behind it.

Turning in another direction, the spinous fins disappearing, the body is covered with bony plates, and these finally interlock with each other, forming a complete bony box absolutely immovable. Species thus provided are known as trunk-fishes (*Ostracion*), and in these the bony plates sometimes extend themselves into spines, especially on the head, which thus acquires a fantastic appearance.

Similar changes are found in other groups, the general rule being extreme specialization of a particular organ, producing its expansion and high development, ultimately followed by its reduction and final disappearance. In each group the species most normally formed are the earliest to appear in geological history, while primitive forms often linger with the others to the present time, most of these groups having their origin in the Eocene. Thus many of these early types, even the earliest, remain to the present day, showing apparently that non-specialization, ultra-specialization and loss of structure are all of secondary importance in the struggle for existence, and that they are conditioned on something else, a law not yet understood.

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Einstein's Theory and Shift of Spectrum Lines

According to Einstein's theory, as I understand it, any time piece, as *e. g.*, a vibrating atom, automatically goes slow if placed in a strong field of gravitation; also the effect of a gravitational field is not to be distinguished from inertia effects in any accelerated motion. A particular illustration is that of a clock moving in a circle. It would seem that there should not be much difference between the effects of an acceleration produced thus and that produced by magnetic or electric fields.

In the Stark effect, where the radiation from atoms in a strong electrical field is studied, it is probable that some of the radiating atoms are in a charged state. If one computes the acceleration of a hydrogen molecule with one unit of charge in a field of 20,000 volts per cm., without considering the dragging effect of other molecular fields, one finds it to be of the order of 10^{16} cm. per sec. per sec., much greater than the value of g at the sun, so that if the atom could radiate in this state very large displacements in the spectrum lines should be expected, amounting to the appearence of new lines. Even if the atom as a whole is neutral, yet because of the nonhomogeneity of the field and the distance between the positive and negative constituents of the atom, considerable accelerations are to be expected which will be larger according as an electron is farther removed from the central nucleus. It is interesting then to recall that Stark found in several instances a displacement of his central image towards the red end of the spectrum, and found the components unsymmetrically placed, also that in a number of cases entirely new lines have been found.

If the preceding point of view is correct, then in any case of luminosity in a gas, since during "collisions" the atoms are evidently in strong fields of force, a slight displacement of the center of gravity of a line towards the red would appear, and this would increase with the pressure as in the common pressure effect. The explanation of the pressure shift as due to the action of adjacent molecular fields has been given, and according to Einstein's theory that would bring it into accord with the general relativity views of time. The difficulty of distinguishing between the pressure effect and the one predicted by Einstein in the sun has been noted. Is it not possible that this lies in the nature of things, the difference being that while all matter is subject in the same degree to gravitation, the

forces between colliding atoms depends on the nature of the atoms and hence the pressure shift is different for different substances?[1]

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May 3, 1920

ANOPHELES LARVÆ IN SALT WATER

DR. F. E. CHIDESTER in SCIENCE, Vol. LI., No. 1314, presented some interesting data on the occurrence of certain North American *Anopheles* in brackish water, and referred to Professor Smith's account, which was published in 1904, and which "has been either ignored or discredited."

It may be of interest to call attention to some other *Anopheles* which live in brackish water and which are not included in Dr. Chidester's account. In my paper on the behavior of certain of our Canal Zone *Anopheles* (*Annals Ento. Soc. of America,* 1915, page 235) I gave the chlorine content of samples of water from which larvæ of *Anopheles albimanus* Wiede, *A. tarsimaculata* Goeldi and *Ædes taeniorhynchus* Wiede, were taken. These samples had from 11,250 to 23,500 parts of Cl per million. Considering sea-water as having 22,000 parts of Cl per million, these samples represented from 51.1 per cent. to 107 per cent. of sea-water. There were 38 samples all told, the average Cl content being 15,817 parts per million, or equaling 72.0 per cent. of sea-water.

We get most of our *A. tarsimaculata* from the lowlands at both ends of the Panama Canal.

JAMES ZETEK

ANCON, C. Z.

QUOTATIONS

THE LISTER INSTITUTE

THE Lister Institute of Preventive Medicine was founded in 1891, in honor of Lord Lister, to conduct scientific inquiries tending to prevent disease. The attachment of a hospital to the institute was specifically excluded by the articles of association, possibly to secure support from the many leaders of medicine who were on the staffs of existing hospitals, and possibly, also, because the intimacy of the union between clinical work and research was not sufficiently realized. By 1914 it had become plain that research could not be conducted with full advantage unless it went hand in hand with clinical opportunity. The experiences of the war drove home the lesson. Members of the staff of the Lister Institute and many other physicians and surgeons engaged on the battle-fronts, at base hospitals, or at military hospitals in this country, found that the immediate task of healing the sick not only advanced abstract knowledge, but set new problems for research. The governors of the institute have resolved unanimously to make the requisite changes in the articles of association. A convenient site for the proposed hospital lies adjacent to the institute. The council of medical research is the channel through which funds provided by the state are allotted to universities and research institutes, and it is to that body that the appeal is addressed. The proposed hospital need not be large. Its beds would be filled with selected cases, varying from time to time according to the specific inquiries that were being made. There would be relief to the general hospitals rather than rivalry with them. The experience of the Pasteur Institute in Paris and of the Rockefeller Research Hospital in New York shows that patients selected for a special purpose take an interest in their involuntary contribution to the advancement of knowledge, and rejoice that their own misfortunes may be the source of relief to others. They are certain of getting treatment even more considerate than that of a general hospital, and they have the advantage of not being the object-lessons of clinical teaching.—The London *Times*.

SCIENTIFIC BOOKS

Pasteur, The History of a Mind. By EMILE DUCLAUX. Translation by Erwin F. Smith and Florence Hedges.[1]

Both the French publication and this trans-

[1] A translation with annotations and additions of the original work, "Pasteur: Histoire d'un esprit," which appeared in 1896.