

occurrence of these organisms will probably indicate a much more wide-spread distribution in oceanic waters.

Pure cultures of ten species of the marine cellulose-destroying fungi have been obtained from wooden test blocks which had been permanently submerged for six to ten months in the sea. Several other species have been isolated from specimens of decaying piling collected by the author in various Massachusetts harbors. The wooden test blocks as well as valuable data have been supplied through the courtesy of the William F. Clapp Laboratories in Duxbury, Mass. The organisms thus far isolated belong to the Pyrenomyces group of the Ascomycetes and to several groups of the Fungi Imperfecti. In certain species the spores and the mode of spore dispersal indicate adaptation to aquatic conditions. In many cases the abundant occurrence of black perithecia on the surface of test blocks and other specimens has facilitated the isolation of pure cultures.

Histological and micro-chemical examination of infected material shows that the fungi bring about a rapid enzymatic hydrolysis of the cellulose in the thick secondary walls of plant fibers. The fungal hyphae penetrate with ease the cell walls of both hard and soft woods as well as those of the various fibers used in cordage. The exposed portions of plant materials attacked by the organisms exhibit a marked deterioration involving loss of cellulose and concomitant reduction in tensile strength.

Extensive studies of these fungi are now in progress to determine their rates of growth on various substrata.

Dr. David H. Linder, of Harvard University, is collaborating with the author in this series of investigations. A joint publication is now in preparation concerned with the morphology, taxonomy and physiology of these organisms.

It is deemed desirable to make a preliminary statement at the present time on the existence of these hitherto unreported marine fungi, owing to their extremely common occurrence and considerable economic significance, particularly in the destruction of cordage and other plant materials exposed to marine conditions.

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### TOO HOT FOR THE DINOSAUR!

THE point to the Dinosaurian bird resemblances is that these recur over a long reach of geologic time and never appear assembled in any one type. An allowable inference is that the Dinosaurs in the course of their long deployment made some approach towards warm-bloodedness; while the respiratory

function may have varied markedly within the group as time went on. Certainly as the Cretaceous waned a much changed respiratory balance ensued. The photosynthetic oxygen release of the more and more distinctly dicotyledonous forests heralded the mammals and the birds.

Also, the laying down of heavy beds of coal and eras of limestone formation meant that an age-long abundance of aerial carbon dioxide, the breathing stimulus, was no more. There the Dinosaur failed; and in all his later life there is merely discernible a course of resistance to environmental change. Continental planation in later Cretaceous time was marked; but taking climate and the food supply there must have been left over many an "asylum" in which the Dinosaur could have lived on, bar that fatal lack of carbon dioxide. In its presence the Dinosaur had earlier lived through several periods of relative climatic warmth.

Admissibly, "the earth makes its own climates." Thus the surficial internal heat must have tended to lessen as Mesozoic times ended and the emergence of the Andines and the Rockies began. Global temperature was then merely normally warm for the Dinosaur far into northerly latitudes. Though, then, the plus and minus chemistry of respiration led to the end of that stupendous reptilian brood. In its stead arose the mammals and birds.

As between origin and extinction the atmospheric oxygen-carbondioxide ratio becomes a foremost factor. As assumed, a late Cretaceous withdrawal of much carbondioxide would have had a worldwide cooling effect fully balancing warming due to continental planation. Hence the time is here when the animal and plant physiologist and the geologist are much in need of coordinating their studies. For there stand adposed in the Mesozoic the Dinosaurs and the Cycadeoids. Were not the factors of origin and extinction complementary for both?

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### THE DIFFUSION OF SCIENCE<sup>1</sup>

THE individual scientist in the vanguard has been able to win to his understanding and eminence only by a lifetime of the most arduous and painstaking thoroughness. He has watched the pernicious social

<sup>1</sup> Excerpt from "The Diffusion of Science" by J. L. Bennett, Chapter III, pp. 51-53. The late Jesse Lee Bennett, of Baltimore, wrote and worked actively in the field of adult education and the diffusion of knowledge. He left a manuscript ten years ago which his mother has just had published by the Johns Hopkins Press, "The Diffusion of Science." This, to me, seems to be a very important book; and from it I have had a short excerpt copied which is so well expressed that I believe that it would be generally helpful to reprint it in the pages of SCIENCE.—JOSEPH L. WHEELER.