

phenomena; and that the known physico-chemical causes do not seem adequate to the result. In other words, the categories of mechanism, of chemistry, and physics, cannot be forced upon vitality without doing violence to the very idea of the organism—a complex adaptive synthesis of matter and energy whose secret remains unread.

When the neo-vitalists go further, and insist on an idealist as opposed to a materialistic conception, they may be quite correct, but they are raising another question, which is philosophical rather than biological.

Biologists are so often preoccupied with anatomy, and the analysis of the dead, that critics have scoffed at biological work as “mere necrology”.
The Kinds of Death. The criticism is healthful, for it must be a purblind biology that ignores the intact living creature; yet in justice it must be remarked that anatomical analysis has done much to vitalize our conceptions of the living. There is a real sense in which it is true that it is only by knowing the dry bones that we can ever really see a living bird. Indeed, one of the characteristic advances of modern biology is a clearer understanding of death. When we understand death much better, we shall understand life a little.

Death plainly means the irrecoverable cessation of organic life, but it seems profitable, both theoretically and practically, to distinguish (*a*) violent, (*b*) microbic, and (*c*) natural death.

(*a*) Violent death, like that of the grouse shot by the sportsman, of the worm swallowed by the fish, of the jelly-fish stranded on the beach, is clearly separable from other forms of death. Life is a function of organism and environment; a violent change in either term of the function spells death. Although there are some organisms, perhaps all fishes, which always die a violent death, it seems fair to regard violent death as something catastrophic, accidental, or casual, something extrinsic and not inevitable.

(*b*) Distinguishable from violent death, connecting it with natural death, is what we may call microbic death, which bulks largely in the mortality of organisms. We