

CAUSE OF THE INCREASE IN THE
RESPIRATORY METABOLISM IN
THE FERTILIZED OVUM

W. E. BURGE, UNIVERSITY OF ILLINOIS

It is known that by whatever method development of the egg is initiated, whether naturally or artificially, oxidation or respiratory metabolism is always increased.

The respiratory metabolism of the unfertilized egg is low while that of the fertilized egg is high. The unfertilized egg is also poor in catalase, an enzyme possessing the property of liberating oxygen from hydrogen peroxide, whereas the fertilized egg is relatively rich in this enzyme.

We have found that whatever increases oxidation in the animal produces an increase in catalase by stimulating the alimentary glands, particularly the liver, to an increased output of this enzyme, and whatever decreases oxidation produces a decrease in catalase by diminishing its output from the liver and by direct destruction.

These observations suggest that the low respiratory metabolism of the ovum before fertilization may be attributed to the low catalase content of the egg, while the increase in the respiratory metabolism after fertilization with resulting development may be due to an increase in catalase brought about by the stimulation of the egg by the spermatazoon to an increased production of catalase.