

piration, the exact nature of the oxidative process leading to the final formation of carbon dioxide and water with the production of correlated intermediate substances.

Those who work on oxidases are continually meeting with evidences of substances in the living tissues which appear to be working in the direction opposite to that of oxidation. One particular oxidase has the power of oxidising indo-phenol-white to indo-phenol-blue, and has been studied by Vernon who calls it "indo-phenol-oxidase." Studying the quantitative estimation of this oxidase, Vernon encountered "the unavoidable presence of reducing substances some of which are possibly enzymes or reductases which act in direct antagonism to the oxidases, and under certain conditions entirely overpower them. Hence the absence of an oxidising action cannot be held to indicate the absence of oxidase unless the conditions are so chosen to give the oxidase the best possible chance of exerting its activity." Now it is just these reducing agents which, on the other hand, I have been studying for some years past. In 1885 Paul Ehrlich published an elaborate research into the reducing power of living organs whereby they were able to reduce indo-phenol-blue to the leuco-compound and alizarine blue to alizarine white. The pigments were injected subcutaneously into living animals. Ehrlich found that almost all organs examined reduced one or other of these pigments, some organs with great energy, such as liver, fat and the gastric mucous membrane. He recognized that, even when he could not detect reduced pigment, it did not prove that there had been no reduction, but only that oxidation had been quantitatively greater. The title of Ehrlich's paper was "The oxygen-avidity of the organism," for he recognized that it was in virtue of the avidity for oxygen on the part of the tissues that they were also able to reduce certain pigments to the colourless or chromogenic condition. In other words, the oxygen avidity is one expression of reducing power. Ehrlich made no suggestion that this power was due to a ferment.

In 1896 I noticed that when an animal, still alive though chloroformed, had been injected with the mixture of gelatine and soluble Prussian blue so much used by histologists for demonstrating microscopic blood-vessels, and had been cut up immediately, that such an organ as the liver, instead of being blue, was colourless. On cutting up the liver and exposing the portions to the air, the blue colour was observed to be restored until one could see minute vessels which a moment before were quite invisible. The restoration of blue colour was very rapidly brought about by pouring hydrogen peroxide