instinct they seize the oxygen in the lymph and cast back their products of metabolism, products of secretion and excretion.

Internal secretion and excretion are cast from the lymph stream to the blood stream simultaneously. The giving up of lymph by way of the thoracic duct is a very remote and fractional part of the interchange.[7] The interchange is almost entirely effective between the lymph spaces and the blood capillaries. It has been found that when an animal is being bled the later portions of blood are more dilute than the first, and this is the case whether the thoracic duct is ligated or not.

Experimentally, we know that from the hind limbs of an animal at rest no lymph flows. By kneading the muscles a free flow can be induced. Passive or active movements of the limbs bring about a free flow. It is known that in the quiescent state lymph coming from the thoracic duct is from the viscera. Glandular or muscular activity takes front rank as increasers of lymph flow.

In harmony with the post-mortem flow of lymph, examination of the web of a frog's foot after the heart has been cut away or the vessels clamped, movement in the blood capillaries will continue from five to fifteen minutes thereafter; when all movement has ceased, it will return if some irritant be applied to the web.

It seems that the lymph circulation being more ancient and stable continues after cardiovascular death. A student whose mental make up enables him to see the other side of things, said in my class that "blood is simply mixed lymph with peculiar cells floating in it." Whatever we find in the serum we know has been cast there by the lymph.

A study of the blood serum is practically a study of general lymph. All the modern studies of serum will apply to the lymph. The causes of vital movement must be analyzed before we gain a clear view of lymph circulation. Evolutionally, this principle must be true, that all protoplasm, not undergoing vital movement in offensive or non-nutritive media must have been lost in the evolutionary process. This must be the basic explanation of all vital movement. By vital movement is meant not only contraction, but intervening relaxations.

The contraction of voluntary muscle is a powerful expulsion force on lymph within its sheath. Now before a voluntary muscle contracts, there is a carbohydrate explosion—giving rise to carbonic-acid, sarcolactic acid, etc. This takes place in the latent period before the visible contraction and changes the reaction of the muscle from an alkaline to an acid reaction. The contraction which follows upon this expels large quantities of lymph. Here clearly vital movement was inaugurated by offensive lymph and the purpose was to expel it.

Now the great stimulus to involuntary muscle movement is venous