

## **Brief historical sketch of the mammalian red blood corpuscle.**

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# BRIEF HISTORICAL SKETCH

OF THE

# MAMMALIAN RED BLOOD CORPUSCLE.

These minute bodies were first seen in the year 1658 by Swammerdam. His observations, however, were not published till a century later. In 1661, Malpigi published his discovery of the blood corpuscles of the hedgehog. He erroneously regarded them as globules of fat. Leeuwenhoek, in 1673, detected them in human blood, and from this time the study of these bodies commenced in earnest. Hewson, in 1770, showed that the human red corpuscles in their normal state were not globules, but "in reality flat bodies." Dr. Young, in 1813, inferred that a depression existed on their flat surfaces—that in fact they were biconcave discs. This was finally determined by Dr. Hodgkin and Mr. Lister in 1827.

By the combined labours of Dr. Young, Dr. Hodgkin, Mr. James Jackson Lister, Professor Gulliver, and Mr. Wharton Jones, it has been definitely determined that the Mammalian Red Blood Corpuscle does not possess a nucleus. As the result then of researches extending over two hundred years, we are in a position to affirm with certainty, that the Mammalian Red Blood Corpuscles in their normal state are non-nucleated biconcave discs of a reddish-yellow colour, having a diameter of about 1-3200th, and a thickness of 1-12000th of an inch.

It is well known that if a drop of mammalian blood is shed, the red corpuscles apply themselves to each other by their biconcave surfaces in such a manner as to form long cylindrical rolls, which resemble piles of coin, and very frequently these arrange themselves so as to form a complete network of rouleaux. Hewson appears first to have observed this curious phenomenon, for he says, "I have seen them with their sides parallel, like a number of coins laid against one another" (*Essay on Red Particles of Blood*, p. 228). Della Torre first depicted these rouleaux three years after Hewson's observation. Since that time they have been most clearly depicted and described by many physiologists, but the cause of their formation remained involved in mystery.

In 1862, the nature of this phenomenon was re-investigated by Dr. Norris, who pointed out a form of aggregation of the corpuscles which had been overlooked by previous observers, which he designated the "tessellate mode of aggregation," and at the same time demonstrated experimentally that aggregation in both cases was dependent upon a peculiar operation of the force of cohesion.—*Proceedings of the Royal Society*, August 28th, 1862, and May 27th, 1869.

In respect to the physical constitution of the Mammalian Red Corpuscle, it was, till recently, held to be a vesicle or sac, with liquid contents; but more recently they have been regarded as "tiny lumps of a uniformly viscous matter," which at best possess only a pellicular covering. As is well known, the principal chemical constituent of the red corpuscle is hæmoglobin, and to such an extent does this override all other constituents, that the whole of a single mammalian corpuscle may be converted into a crystal of hæmoglobin.

The mode of origin of the Mammalian Red Blood Corpuscle has always been involved in the profoundest obscurity. The opinion generally entertained is, that it is in some way developed from the white blood corpuscle; but so little is this idea derived from the observation of transition forms, that Professor Kolliker suggests "that it may take place too rapidly to be in any way obvious with our means of observation."

The author of this sketch holds that, like the formless elements of the blood, these morphological elements are produced *de novo* from the food and fluids of the body ; if correct, the importance of such a view cannot be overrated in connection with such diseases as anæmia, leucocythemia, and with the therapeutical effects of bleeding. By the discovery of a new principle in chemistry and physiology, it is shown that such an idea is not only tenable, but eminently probable.

It is found that the colouring principles associated with plants and animals, such as hæmatin or cruorin, chlorophyll, carmine, &c., possess the power, under suitable conditions, to combine with protein and other substances, and to produce instantaneously, by a process of precipitation, equable sized organic globules, which are permanent in the surrounding aqueous fluids. These morphological elements are therefore the immediate result of the mere admixture of suitable formless liquids.

This principle, which was discovered by Dr. Norris, in May, 1873, demonstrates that if in any part of the economy hæmatin and globulin come together, in the presence of a third suitable organic fluid, hæmoglobin corpuscles must inevitably be produced, in numbers proportionate to the amount of hæmoglobin present. This probably occurs in the lymphatic glands, but there is no reason why it should be exclusively confined to this region.

In accordance with this view, we have no longer to search for transition forms (which have been looked for in vain), but only for the chemical substances, the organs which elaborate them, and the regions in which they combine. This view refers the formation of the blood, as a whole, almost entirely to the elements of the food.

*June 12th, 1875.*

The nature of this element holds that the bodies elements of the  
these three unchangeable elements are gathered & now from the food  
and their elements; it cannot be the product of any view of the  
associated in connection with this disease as a general principle  
with the development of the blood. In the theory of a new  
principle in chemistry and physiology, it is shown that such as this is not  
only teaches but explains the facts.

It is found that the various properties associated with these  
animals such as human or certain, chlorophyll, contains the power to  
power under suitable conditions to combine with protein and other sub-  
stances and to produce in consequence, by a process of precipitation, simple  
solid organic bodies which are present in the surrounding medium.

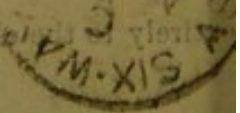
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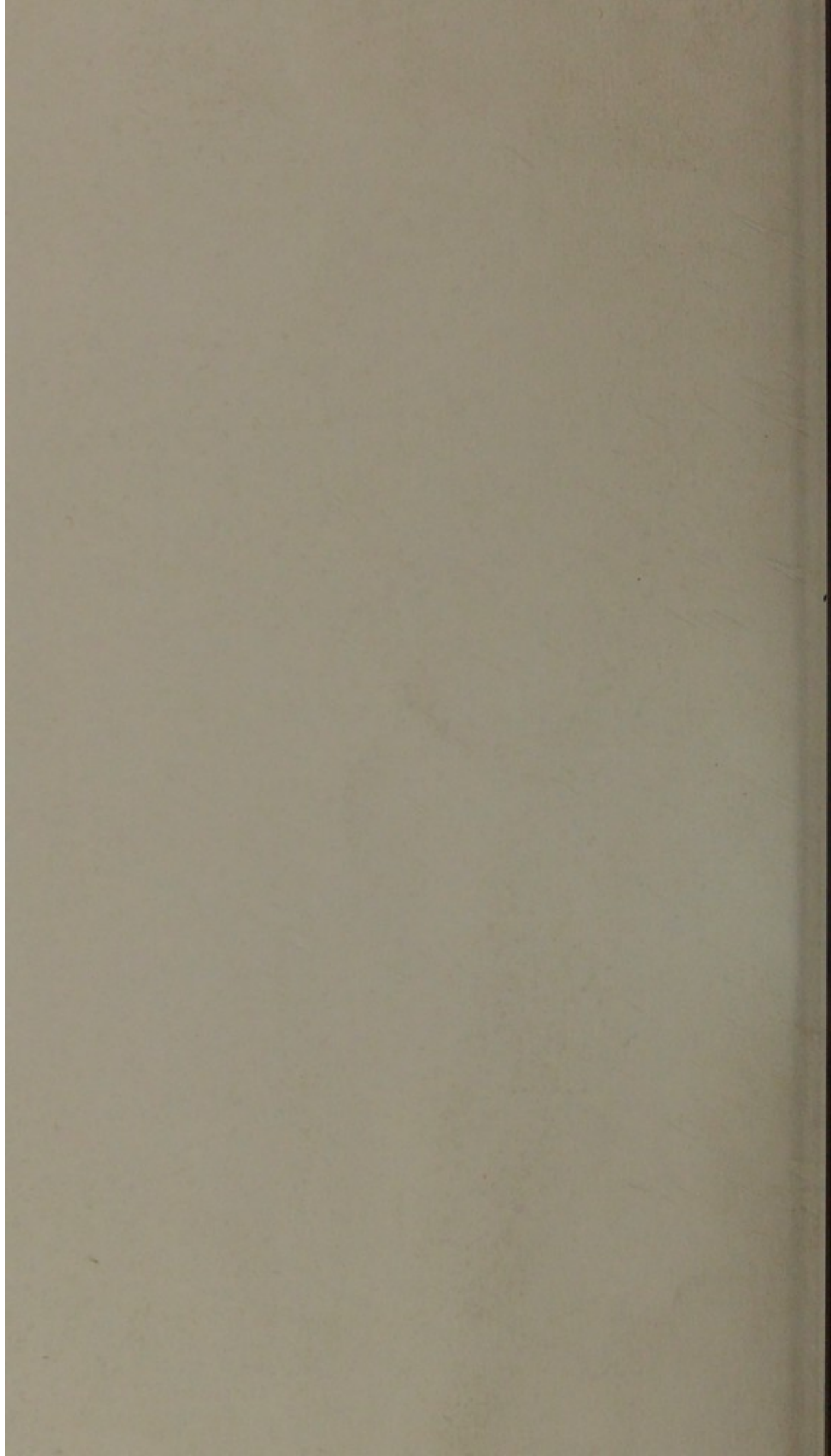
*J. Clay Esq.*



In the blood which is the result of the process of the blood  
the blood have been looked for in vain, but only for the chemical  
elements which elaborate them, and the regions in which they  
are formed, the formation of the blood, as a whole, almost



June 1816





DICTATED  
SOME TIGHT  
GUTTERS

