

kill bacteria, bacteriolysins dissolve them, agglutinins and precipitins compel bacteria to clump together, opsonins help to prepare bacteria for digestion, etc., etc. Some of these bodies are complex, being composed of two substances. Thus bacteriolysis depends on the presence of two substances. One is specific, that is, specially antagonistic to the microbe in question (and can be formed by inoculating an animal with the microbe); the other substance is present in ordinary blood serum and rapidly disappears if blood is drawn. The former is known as "immune body" (amboceptor) and being able to withstand heating to 60° C., is called thermostable. The latter is known as complement (receptor alexin addiment cytase or hapton) and is thermolabile. As these opsonins prepare bacteria for ingestion by leucocytes, much importance is attached to their study, but I am quite sure that the study of phagocytosis cannot be neglected.

Phagocytosis, or the ingestion of foreign bodies by leucocytes is usefully distinguished as "spontaneous" and "induced." Spontaneous phagocytosis is defined as that process of ingestion which occurs when bacteria or inert particles which have not been acted upon by the blood fluids are submitted to the action of washed leucocytes in an indifferent medium (as physiological salt solution). It differs from that known as induced phagocytosis in certain respects, being less rapid and less complete. Induced phagocytosis is that observed when leucocytes are brought in contact with bacteria which are or have been submitted to the action of serum. The experiments of Wright and Douglas go to prove that phagocytosis is very largely dependent upon the presence in the blood plasma and serum of these opsonic substances, while the leucocytes are regarded as playing a subordinate part. As a corollary, immunity of cure, when brought about by vaccine treatment (which stimulates the formation of opsonins and raises the "opsonic content" of the blood) may be said to result from changes in the blood fluids rather than in the white corpuscles. On this depends the belief that the "opsonic index" of blood is the gauge of a person's powers of phagocytosis, because the person's own leucocytes are neglected as a factor, and, indeed, are not used in the experiment. Wright and Douglas believe that differences in the phagocytic count depend on the properties of the serum, not on the "strain" of the leucocytes, "æqualia æqualibus." In my opinion this distinction may be too rigidly drawn. Variations in structure and function are infinite in the animal body, and why should the blood cells escape them?

Thus the powers of phagocytosis of the different varieties of leucocytes in the same person are well known to differ, and this, I and Dr.