manifest itself in one man as eczema of the skin, giving rise to redness and intense itching; in another as neuralgia, causing most severe pain; in a third as bronchitis, producing a dis­tressing cough; in a fourth as dyspepsia, giving rise to flatulence and intestinal disturbance; and in a fifth as inflammation of the great toe, accompanied by redness, swelling and pain. 'Γhe therapeutic measures employed in these different cases may be directed towards alleviating the symptoms, such as itching, pain, cough and swelling, in which case the treatment will be merely *symptomatic·,* or they may be directed towards removing the root of the disease, viz. the gouty condition underlying them all, and thus effecting a *radical* cure. It very frequently happens that we do not know what the underlying condition is, and we are forced simply to relieve as best we can the most prominent and most distressing symptoms. In symptomatic treatment we are frequently obliged to use remedies simply because we know they have done good before in similar cases, and we expect them to do so again without having the least idea of how they act. Thus in acute gout the most common and most trusted remedy for removing the pain is colchicum, but at present we do not know what action it has upon the system, or why it gives so much ease in the pain of gout while it has comparatively little effect upon pain due to other causes. This plan of treatment is termed *empirical.* It is a useful method, and is often very satisfactory, but it has the disadvantage that it admits of but little progress, and when a trusted empirical remedy fails we do not know precisely in what direction to look for a substitute. In contradistinction to empirical we have *rational* therapeutics, by which we mean the application of a remedy, whose mode of action we know more or less perfectly, in diseased conditions, the nature of which we also understand more or less fully. As an example may be taken the use of nitrite of amyl in angina pectoris. It has been found that in many cases of this disease the pressure of blood within the arteries becomes increased, probably from spasmodic contrac­tion of the arteries themselves. Nitrite of amyl has the power of dilating the arteries; it has consequently been employed with much success in lowering the blood pressure and removing the pain in angina pectoris. But such rational knowledge as this not only enables us to remove pain at the time, but helps us to prevent its recurrence. For on the one hand knowledge of the fact that nitrite of amyl lessens blood pressure has led to the successful employment of other nitrites and bodies having a similar action, and on the other the knowledge that increased blood pressure tends to cause anginal pain leads to the pro­hibition of any strain, any food, any exposure to cold, and also of any medicines which would unduly raise the blood pressure. Here we notice one of the greatest advantages of rational over empirical therapeutics. In cases of angina, while the resistance opposed to the action of the heart by spasm in the vessels may be great, the heart itself may be feeble, and it may therefore be necessary to give some remedy which will increase the power of the heart. But if such a remedy were given alone it might, and probably would, act on the arteries as well as the heart, and by causing the contraction of the vessels do more harm than good. But if we know what remedies will increase the power of the heart and what will lessen resistance in the vessels, we may combine them and thus obtain the objects we desired, viz. removal of the pain, better action of the heart, and more perfect circulation.

The testing of ideas by observation and experiment which was begun in anatomy by Vesalius, and by Harvey in physiology, was applied by Morgagni to alterations in the organs produced by disease, by Bichat to the tissues, and by Virchow to the cell. The study of disease in the living body may be said to have been begun by John Hunter, developed by Magendie, Claude Bernard, Brown-Séquard and others. Of late years enormous impulse has been given to our knowledge of the causa­tion of disease by microbes, through the works of Gaspard, who injected putrid matter into the veins of a living animal; by Villemin, who discovered that tuberculosis is infective; by Davaine; and especially by Pasteur, Koch and others too numerous to mention, who have worked, and are still working, at the microbic causation of disease with marvellous success.

The natural end of life is that all the organs should become old and gradually decay at the same time, so that at the last the individual should become less and less active, weaker and weaker, and finally die without any definite disease, without pain and without struggle. But this is exceptional, and generally one part gives way before another, either on account of one part being naturally weaker or of one part having been overtaxed or more severely attacked by some injurious external influence, or by some undue preponderance of another part of the body itself. For health consists in a due proportion between the action of all the different parts of the body, and if one part be unnaturally strong it may lead to injury or death. Thus a very strong heart, although it may be useful to its pos­sessor for many years, driving the blood rapidly through the vessels, and supplying all his tissues with such abundant nutri­ment as to enable him to endure great exertion, mental or bodily, may in the end cause death by bursting a vessel in the brain, which might have resisted the pressure of a feebler circulation for years longer. On the other hand, a heart that is too feeble may cause its owner’s death by its in­ability to carry on the circulation against increased resistance. This may occur suddenly, as when the resistance is increased in the arterial system by a sudden exertion or strain, and more slowly when the resistance is increased in the pulmonary circulation by inflammation of the respiratory passages. The thyroid gland, which is situated in front of the neck, yields a secretion which passes into the blood and there tends to maintain a state of moderate dilatation in the blood-vessels and of oxidization in the tissues, so that the circulation remains good and the body-heat and muscular activity remain well maintained. When this gland becomes enlarged, and its secre­tion consequently increases, the vessels dilate, the heart beats more rapidly, the skin becomes too hot, the nervous system becomes irritable, and tremors occur in the limbs. On the other hand, when it becomes atrophied the circulation becomes feeble, the face heavy and dull, the patient suffers from cold, the features grow lumpish, mental processes become sluggish, and bodily vigour diminishes.

Disease of the whole body may thus be produced by over­action or under-action of some part of it, but such causes of disease are slight as compared with the effect of external noxious influences, and more especially the effect of microbes. These enter the body through various channels, and once they have effected a lodgment they grow, multiply and give rise to various poisons which attack and injure or destroy different tissues or organs in the body. Various safeguards are provided by nature to prevent their entrance. On the skin we have a thick epidermis through which microbes cannot pass, although if an entrance is obtained for them by a prick or cut they may readily grow in the tissues below and spread from them throughout the whole body. They pass more readily through mucous membranes, but almost every one of these is provided not only with a coating of mucus, which obstructs their passage, but with some reflex mechanism which tends to remove them. Thus irritation of the eye causes winking and secretion of tears, by which the irritant is removed; irritation of the nose causes sneezing; of the air-passages, coughing; of the stomach, vomiting; and of the intestines, diarrhoea. Even when they have passed through an abrasion in the skin or through the mucous membranes and enter the blood they are met, in some instances, by a toxic action of the blood itself upon them; and in others they are attacked by the white corpuscles, which destroy them, eat them up, and digest them, the process being known as *phagocytosis.* The greater the number of leucocytes that can reach the spot where the invading microbes enter the more quickly can the microbes be destroyed and general infection prevented. The microbes appear in many cases to attract the leucocytes (positive chemiotaxis), but when very virulent they usually repel the leucocytes (negative chemiotaxis)