

tween a living body and an inanimate machine should not be pushed too far, still the forces operating on each can reasonably be compared, and the more closely we know the limits of health, and the deviations that may occur from it consistent with life, the more surely can we propose to rectify the errors in function. Hence it is plain that a truly expressed science of medicine cannot be evolved except by endeavoring to refer the processes going on in the animal body, and therefore also the influence of remedies on these, to the ultimate laws of physics, chemistry and physiology. "Chemical enquiry is now finding its way into many of the remoter secrets of function, and is likely before long to establish some laws of molecular constitution which will enable us to classify unknown remedies, and to explain and calculate their actions." (Dr. Allbutt.)

The observations of Bence Jones and Dupré, who were the pioneers of this work in this country, have disclosed a rich mine of discovery, and they have demonstrated the existence of a chemical circulation within the body, which rivals in importance that of the older mechanical circulation of the blood. By the application of spectrum analysis they have shown the wonderful rapidity with which crystalloids diffuse from the blood into the colloid tissues, and from the tissues into the absorbents, and so the passage of all substances through the human body is determined by the laws of diffusion, modified by pressure. For example, if 20 grs. of carbonate of lithium are taken into the stomach, it will, in two and a half hours, have passed into every particle of the textures, and beyond the blood circulation even into the most distant parts, and in three and a half hours it will be distinctly present in each particle of the lens. In about seven days the lithium will be entirely eliminated from the body. When 7 grs. of carbonate of lithium were given eight hours before delivery, the lithium was subsequently detected in each particle of the umbilical cord.

Again, they have determined the existence, in animals, of a widely diffused substance which closely resembles quinine, and which has been named animal quinoidine. This leads to a plausible supposition, the only one yet offered, as to the mode of action of quinine in curing ague, and the hypothesis, though not proven, opens up a hopeful prospect of possible discovery.

The history of organic synthesis dates only from the year 1828, and remained comparatively barren for some years, but since the year 1845, its progress has been truly marvellous. The most complex substances are being formed at will, while the last barriers between organic and inorganic bodies are disappearing, and as the advances in this branch of science are, if I may say so, in the highest degree cumulative, the time is probably not far distant when, by the artificial formation of morphia and quinia, we shall be able to dispense with the production of opium, and the cultivation of cinchona in our colonies.