

artisan—it is of value paramount to physiology, to physics, to manual dexterity,—it must be hand in hand with all these, when they are practised on sure and scientific bases.

Without Chemistry you will be able to understand neither arterialization or the changes that take place in the lungs during respiration:—nor calorification, or the manner in which animal heat is generated, and the temperature of the frame kept at an equable degree in all climates and under all ordinary circumstances; without it, assimilation, or the transformation of the elements of the food into new compounds, analagous or similar to the various parts of the living organism; without it, the several secretions and excretions, and the circumstances modifying their character, cannot be made intelligible. Since the application by Lavoisier of the quantitative method of research to Chemistry, or of results drawn from calculations of weight and measure, this science has unobstructedly marched towards a high standard of eminence: it is now considered as indispensable to physiology, and in a few years, I doubt not, it will be inseparable from it. I quote the words of an author who has, in a very few years, made for himself a reputation unrivalled for the time:—"The imperfect character of the researches of physiologists for the last years, in explaining the functions of many of the important organs, as of the spleen and other glands, establishes the fact that their limited acquaintance with the laws of Chemistry has been the cause of the reproach cast upon them, and will continue to be so till the two branches are intimately blended together." Minute anatomical investigation into the tissues and even microscopic observations of the ultimate reticulated nature of the blood-vessels of the different organs, cannot determine without Chemistry the character of their functions any more than contemplating the organ of hearing can give us an idea of the auditory apparatus and the acoustic nerve, without a knowledge of the physical laws regulating the transmission of sound by vibratory motion. It is solely by a knowledge, and an intimate one too, of the laws or principles regulating the action of forces or affinities, operating at insensible or inappreciable distances, that we can arrive at even an approximation of the truth. I would not have you suppose that, in thus speaking, I wilfully overlook the *vis vitæ-vitality*—that remarkable force always in action, both in the living vegetable and animal organism,—nor those organs of vital phenomena, present in all classes of animals; in the higher orders, embracing feeling, sensation, consciousness, and intellectual faculty; on the contrary, this force establishes the affinities requisite for the formation, from the same elements, of those compounds created in the system, which, deprived of this intermediate bond, are transformed into new combinations essentially differing from the former. This force continues constantly in active existence until death, and its cessation or obstruction in any part is that anomalous condition termed disease. In pathological investigations you will have to contemplate the living powers as being in a certain condition of decay or arrestation,—that condition in which the laws regulating the actions of inanimate matter are unaffected or uncontrolled by it, the vital energy; and you will learn that several decompositions are thus effected similar to those in the laboratory. It follows, therefore, that the doctrines of Chemistry may impart useful aid to Pathology, though I acknowledge that little has been hitherto effected in this department of Medical inquiry. I sincerely hope that the last few years, rich as they have been made by discoveries in organic Chemistry, may become yet more beneficial to the human family, by the practical application of them to the treatment of disease.

To the pharmacist or pharmacopolist the powers of Chemistry have brought in latter days, an auxiliary of the greatest importance. The preparation of remedial agents from substances derived from the mineral or vegetable kingdom, is carried to its present degree of excellence solely by Chemistry—by whose laws we are enabled to detect adulteration, and prevent the prescription of incompatibles, or those substances which neutralize each other's effects. The remedial agents, arranged by Dr. Murray in his classification