SCIENCE


If we are not extensively indebted to Americans for discoveries in natural science, we are, at least, indebted to them for many excellent manuals upon the subject. The best thing of the kind that we have is from the pen of those who devote themselves to science in that country are more occupied in diffusing a knowledge of its principles than in extending its boundaries. It is perhaps on this account that they become more alive to the necessities of the elementary literature in science than we are in England. Be that as it may we regard other sciences, there is no doubt, the subject which has been taken up by Prof. Cooke is one which has been much neglected in our elementary treatises on Chemistry. The science of chemistry embraces a knowledge of the changes to which bodies are liable, and also of the changes they are capable of producing on other bodies, with a knowledge of the causes which produce these changes, and before such changes can be studied, it is essential that the specific properties of these bodies before they are changed, should be thoroughly known. There is, in the formation of chemical knowledge without this starting-point. For such knowledge is not regarded as chemical knowledge unless the properties of a body have been ascertained and communicated this state of knowledge by the body. All the properties which a body may possess independent of chemical change are called physical. Yet these are the very properties which are changed by chemical force. Hence the practice of studying, first, the physical properties of bodies. It is, however, be expecting too much that every chemist, previously to entering upon his own special studies, should have mastered all the problems connected with the study of physics. Hence a practice has sprung up amongst those of introducing remarks, more or less extended, upon the principal marks of bodies under the influence of gravitation, motion, heat and electricity. As a result the world has obtained the name of Chemical Physics. These introductions in some of our older manuals have been short enough. Some of them omit sight and electricity, others heat or some principal branch of inquiry into this subject; but gradually it has assumed more importance. This has been especially the case in chemical text-books intended for medical students, not only on account of the importance of the physical properties of matter in relation to chemistry, but also on account of the relation of the purely physical properties of matter to the vital properties of the tissues of animals.

Another phase of inquiry which has given to the chemist and the physiologist a deeper interest in the physical properties of matter is that which resulted in the production of Mr. Grieve's able able 'On the Correlation of Physical Forces.' In this work he has gathered up those threads of inquiry which have consist in a theory of the probable identity of the forces of nature. Motion, heat, light, and electricity have been but the preliminary manifestations of an ever-changing primal force. It was but a step to correlate these physical forces with the phenomena of life in plants and animals. We are now aware that the scale of scientific facts for such a generalization, we are largely indebted to the writings of M. Pasteur and C. G. Gascoigne.

It is, then, with much pleasure that we announce a work from America which, whilst intended for the student of chemistry, embraces, as far as possible the chemical physics commensurate with the important aspect this branch of science has already assumed amongst original inquirers in this country and on the continent. The present volume embraces the subjects of the general properties of matter, the three states of matter, and heat. The author proposes to treat of living, crystallography and electricity in a separate volume; and on stoichiometry, or the principles of chemical classification, in a third volume.

The subjects which are brought together in this first volume are far practical purposes treated of by other authors in separate volumes. Thus, in connexion with gravitation, the subject of weight is discussed as a necessary preliminary to the study of forces, and chapter is added on weighing and measuring, which will be found of considerable practical value to the working chemist. In the chapter on Heat, Specific and Equivalent, the subject has been embodied, and an interesting account is given of the principal results of the observations of this great experimentalist. The whole subject also of the molecular and physical forces acting between heterogeneous molecules, embracing the laws of the absorption of liquids and the diffusion of gases, the result of inquiry into the physiological,—is treated with great ability and judgment.

As an introduction to chemical physics, this is by far the most comprehensive work in our language. With the facts of life it may be considered too extended for use in the class-room. We have, however, no doubt that it will find its way into the libraries of students who are ambitious of laying a sure foundation for their chemical knowledge.