

2.  
Insuffici-  
ency of the  
astronomi-  
cal, atomic,  
and kinetic  
views.

ficient to cover the whole field. The law of gravitation embraced cosmical and some molar phenomena, but led to vagueness when applied to molecular actions. The atomic theory led to a complete systematisation of chemical compounds, but afforded no clue to the mysteries of chemical affinity. And the kinetic or mechanical theories of light, of electricity, and magnetism, led rather to a new dualism, the division of science into sciences of matter and of the ether. The unification of scientific thought which was gained by any of these three views, the astronomical, the atomic, and the mechanical, was thus only partial. A more general term had to be found under which the different terms could be comprised, which would give a still higher generalisation, a more complete unification of knowledge. One of the principal performances of the second half of the nineteenth century has been to find this more general term, and to trace its all-pervading existence on a cosmical, a molar, and a molecular scale. It will be the object of this chapter to complete the survey of those sciences which deal with lifeless nature by tracing the growth and development of this greatest of all exact generalisations—the conception of energy.

3.  
The concep-  
tion of  
energy.

The complex of ideas and the manifold courses of reasoning which are centred in this conception form such an intricate network, the interests involved are so great, the suggestions which led up to it so numerous, the consequences which resulted for science and practice so far-reaching, that the historian has no little difficulty in laying bare the many lines of thought which apparently cross and re-cross each other. Accordingly the