

departments of science have so multiplied that hardly any facts or theories which come within the scope of this work are inaccessible to the general reader. On the other hand, it has been deemed necessary to explain every subject as it has arisen, for many of the readers of this volume will perhaps be unfamiliar even with the rudiments of all the departments of science which have necessarily been touched upon.

Much of the content of the following pages has already been set forth in lectures. The general conclusion was presented last February to the members of the Harvard Seminary of Logic; later in the academic year I delivered the substance of the book as part of a college course to my students of biological chemistry in Harvard College.

I am indebted to many of my colleagues in Harvard for valuable assistance, criticism, and expressions of opinion. Without such assurances that I have not fallen into gross blunders, and that the conclusions appear reasonable to experienced men of science, I should not have dared to undertake a task which overtaxes my knowledge, or positively to assert a proposition which is in conflict with much of the scientific thought of the last half century. Especial thanks are due to Professor