The Atomic Theory as Applied To Gases, with Some Experiments on the Viscosity of Air

by

Silas W. Holman

and

Luisa Hernández

Submitted to the Department of Physics and
the Department of Mechanical Engineering
in partial fulfillment of the requirements for the degrees of

MASTER OF SCIENCE IN PHYSICS

and

MASTER OF SCIENCE IN MECHANICAL ENGINEERING

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1876

© 1876 Silas W. Holman and Luisa Hernández. This work is licensed under a
CC BY-NC-ND 4.0 license.

The authors hereby grant to MIT a nonexclusive, worldwide, irrevocable, royalty-free license to exercise any and all rights under copyright, including to reproduce, preserve, distribute and publicly display copies of the thesis, or release the thesis under an open-access license.

Authored by: Silas W. Holman
Department of Physics
May 18, 1876

Authored by: Luisa Hernández
Department of Research
May 18, 1876

Certified by: Edward C. Pickering
Professor of Physics, Thesis Supervisor

Certified by: Secunda Castor
Professor of Research
Professor of Knowledge
Professor of Reason, Thesis Supervisor

Accepted by: Primus Castor
Professor and Graduate Officer, Department of Physics

Accepted by: Tertius Castor
Professor and Graduate Officer, Department of Mechanical Engineering

THESIS COMMITTEE

Thesis Supervisors

Edward C. Pickering
Professor of Physics
Department of Physics

Secunda Castor
Professor of Research
Professor of Knowledge
Professor of Reason
Department of Research

Thesis Readers

Marcus Gavius Apicius
Professor of Cooking Arts
Department of Food Science

Marie-Antoine Carême
Professor of Haute Cuisine
Department of Food Science

Miles Gloriosus
Professor of Personal Pronouns
Department of Rhetoric

The Atomic Theory as Applied To Gases, with Some Experiments on the Viscosity of Air

by

Silas W. Holman

and

Luisa Hernández

Submitted to the Department of Physics and
the Department of Mechanical Engineering
on May 18, 1876 in partial fulfillment of the requirements for the degrees of

MASTER OF SCIENCE IN PHYSICS

and

MASTER OF SCIENCE IN MECHANICAL ENGINEERING

ABSTRACT

The developments of the "kinetic theory" of gases made within the last ten years have enabled it to account satisfactorily for many of the laws of gases. The mathematical deductions of Clausius, Maxwell and others, based upon the hypothesis of a gas composed of molecules acting upon each other at impact like perfectly elastic spheres, have furnished expressions for the laws of its elasticity, viscosity, conductivity for heat, diffusive power and other properties. For some of these laws we have experimental data of value in testing the validity of these deductions and assumptions. Next to the elasticity, perhaps the phenomena of the viscosity of gases are best adapted to investigation.[1]

Thesis supervisor: Edward C. Pickering
Title: Professor of Physics

Thesis supervisor: Secunda Castor
Title: Professor of Research
Professor of Knowledge
Professor of Reason

[1] Text from Holman (1876): doi:10.2307/25138434.