

**THE MECHANICAL EUCLID, CONTAINING THE
ELEMENTS OF MECHANICS AND
HYDROSTATICS. DEMONSTRATED AFTER THE
MANNER OF THE ELEMENTS OF GEOMETRY;
AND INCLUDING THE PROPOSITIONS FIXED
UPON BY THE UNIVERSITY OF CAMBRIDGE AS
REQUISITE FOR THE DEGREE OF B.A.**

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WILLIAM WHEWELL

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TO WHICH ARE ADDED

REMARKS ON MATHEMATICAL REASONING
AND ON
THE LOGIC OF INDUCTION.



By THE REV. WILLIAM WHEWELL, M.A.
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CONTENTS.

INTRODUCTION,—ELEMENTARY PURE MATHEMATICS.

ALGEBRA.

	PAGE
(1). Algebraical Signs	1
(2). Addition and Subtraction	6
(3). Multiplication	7
(4). Division	—
(5). Reduction to a Common Denominator	8
(6). Addition of Fractions	9
(7). Multiplication of Fractions	10
(8). Division of Fractions	—
(9). Definition of Proportion	11
(10). Consequences of Proportion	—
(11). Variation	15
(12). Arithmetical Progression	17
(13). Geometrical Progression	19

GEOMETRY.

Definition of Proportion	20
Lemmas respecting Proportion	21
Euclid, B. vi. Definitions and Enunciations	22
Euclid, B. xi. Definitions	24
Lemma respecting Arcs of Circles	—
Lemmas respecting Prisms	25

MECHANICS.

BOOK I. STATICS.

Definitions and Fundamental Notions	26
Axioms	28
Postulates	30
Propositions respecting the Lever	31
_____ the Composition of Forces	45
_____ the Wheel and Axle	49
_____ Pulleys	51

	PAGE
Propositions respecting the Inclined Plane	54
Virtual Velocities	55
the Center of Gravity	59
Pressures on Fulcra	68
 BOOK II. HYDROSTATICS.	
Definitions and Fundamental Notions	72
Axioms	—
Propositions respecting the Pressure of Fluids	74
Specific Gravity	94
the Hydrometer	99
the Weight of Air and the Barometer	101
the Siphon	105
the Common Pump.....	107
the Forcing Pump	109
the Air-Pump	110
the Condenser	111
the Thermometer	113
 BOOK III. THE LAWS OF MOTION.	
Definitions and Fundamental Principles.....	116
The First Law of Motion, and its Consequences.....	118
The Uniform Force of Gravity, and its Consequences.....	119
The Second Law of Motion, and its Consequences	125
The Third Law of Motion, and its Consequences	131
Examples	140
 REMARKS.	
<i>Sect. 1.</i> On the Grounds of Mathematical Reasoning.....	143
<i>Sect. 2.</i> On the Logic of Induction	172

P R E F A C E.

By calling this little work *The Mechanical Euclid*, I mean to imply, that I have aimed at making it such a coherent system of exact reasoning, as that for which Euclid's name is become a synonym. Such a system of Mechanics, when once constructed, can hardly fail to be of use in that disciplinal employment of Mathematics in which Euclid's *Elements of Geometry* have hitherto most deservedly held their place without a rival. And such an application of the elementary portions of Mechanics and Hydrostatics having been resolved upon by the University of Cambridge, and having been appointed as an essential part of the examinations for the usual degrees, I have very gladly made my attempt to produce such a Manual as this occasion seems to require. It is proper to state, however, that though I had the honour to be one of the members of the Syndicate which drew up the Report recommending this change in the University examinations, (a recommendation adopted by the Senate), I am not in any degree authorized to put forth this book in any public capacity. The responsibility for everything which it contains, both as to plan and execution, rests upon me as an individual. The Treatise has no claim to adoption except what depends upon

its own merits, and its consistency with the decrees and usages of the University in respect to examinations.

Although the work is now published with immediate reference to the new scheme of examination, it will easily be seen that it does not refer solely to that object. I have introduced many propositions into my series, which do not occur in the list of Propositions published by the the University as requisite for a degree. This I have done, partly in order to make the proofs rigorous and the propositions of more convenient length and form; and partly in order to afford the means of extending this line of examination hereafter, if it should be thought desirable to do so. For the latter purpose I have also added to the two Books on Statics and on Hydrostatics, a third Book on the Laws of Motion.

The cases in Mechanics in which fundamental principles are proved by reference to facts, appeared to me to afford a favourable opportunity of giving, if possible, greater precision to the phrase, so commonly employed, of *Reasoning by Induction*. In order to mark as distinctly as I could the nature of this reasoning, I have reduced all the proofs of this kind which occur in the resent work, to one common shape or *formula*. And in the Remarks at the end of the work, I have endeavoured to point out the general applicability of this formula, the conditions on which its conclusiveness depends, and the lessons which it suggests. If this attempt to draw the outline of a

system of *Inductive Logic*, different from the common Syllogistic or Deductive Logic, be in any degree successful, it must, I think, be considered as an approximation to the solution of a very prominent and important problem.

The Remarks to which I have just referred contain moreover some reflections upon the use of Mathematics, especially *mixed* Mathematics, as an instrument of education; and also some observations upon the grounds of Mathematical Reasoning. These observations are closely connected with the views here presented respecting the peculiarities of Inductive Reasoning. I should wish the remarks now offered to be taken in connexion with those which I published a little while ago, under the title of "Thoughts on the Study of Mathematics, as a Part of a Liberal Education;" a pamphlet in which I recommended a change in the examinations of the University, such as has now been adopted. The whole subject of the grounds of the truth of our mechanical doctrines will, I hope, be found to derive much illustration from the History of Mechanics contained in my "History of the Inductive Sciences."

In my remarks on Mathematical Reasoning, I have not hesitated to dissent from the views propounded by the late Professor Dugald Stewart, and I have stated my dissent and the reasons for it without ceremony. I am persuaded that no one who is solicitous about truth in such matters, will see in this course any want of respect for that amiable and instructive writer.