THE QUADRATURE OF THE CIRCLE, THE SQUARE ROOT OF TWO, AND THE RIGHT-ANGLED TRIANGLE

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The Quadrature of the Circle, the Square Root of Two, and the Right-Angled Triangle by
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WILLIAM ALEXANDER MYERS

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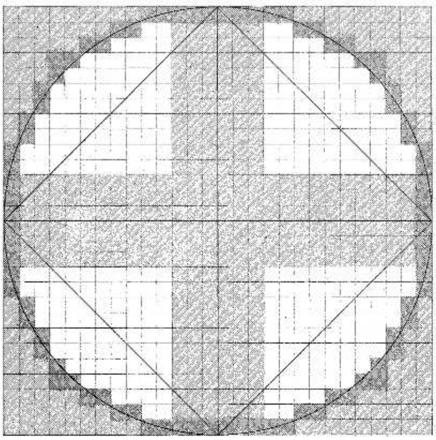

VERIFICATION OF THE QUADRATURE OF THE CIRCLE.

Let either of the above *quadrants* be divided into 196 squares, having 14 on each side; then the line which is the side of the whole inscribed square will divide the quadrant into two equal parts, each of which contains 98 squares.

And the arc of the circle belonging to the quadrant will divide the outside 98 squares into two parts, which shall be to each other as 4 is to 3.

For the arc of the quadrant cuts 21 of the squares, which form a complete *arch*; and there are 142 squares within those which are cut by the arc and 23 without; then if these 21 squares be divided in the proportion of 4 to 3, there will be 12 squares that will fall within the circle and 9 that will fall without it; then 142 + 12 = 154, the number of squares within the arc, and there are 196 squares in the quadrant.

Then 154 is to 196 as 11 is to 14, for $\frac{196}{154} = \frac{14}{11}$

Again, of the 154 blocks within the arc, if 98 be deducted, we shall have 56 between the side of the inscribed square and the arc of the circle; and if to the 33 blocks without the arc 9 be added, we shall have 42 blocks without the arc of the circle; then 56 is to 42 as 4 is to 3.

Again, if the sides of the squares which form the *arch* of the quadrant, viz: $5 + 2 + 2 + 2 = 11 \times 2 = 22$, be multiplied by 4, we shall have 88 sides for the circumference of the circle, and as each of the quadrants has 14 squares on each side, we shall have 28 sides for the diameter of the circle.

Then dividing the given circumference by the given diameter, we have $88 \div 28 = 22 \div 7 =$ 3.142857, or $3\frac{1}{7}$, *which is the true ratio of the circumference to the diameter of the given circle.*

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QUADRATURE OF THE CIRCLE,

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SQUARE ROOT OF TWO,

AND THE

RIGHT-ANGLED TRIANGLE,

BY WILLIAM ALEXANDER MYERS,
President of Myers' Commercial College, Louisville, Ky.

SECOND EDITION.

"Where is the wise."—1st Cor., 1, 20. "Now the serpent was more subtile than any of the beasts of the earth which the Lord God had made."—Gen. iii, 1.

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AUTHORS MADE USE OF IN THE PRESENT VOLUME.

Should the student desire more general information upon the subjects treated of in the present volume, he is referred to the following works which have been freely used by the author wherever they have been found to be of service to his cause. They will be found to be among the best of their kind

"Montuclas' History of Mathematics;" "Hutton's Recreations;" "DeMorgan on the Law of Probabilities;" "Elements of Euclid," by Todhunter; "Elements of Euclid," by Thompson; "Davies' Le Gendre;" "Robinson's Geometry;" "Chauvenet's Geometry;" "Loomis' Geometry and Trigonometry;" "Bullfinch's Beauties of Mythology;" "Minifee's Draughting and Architecture;" "Home and School Journal;" "Chambers' Encyclopædia," and the "Douay Bible."

TO

THE AMERICAN PEOPLE

WHOSE LOVE FOR LEARNING AND DEVOTION TO THE TRUTH,

ARE ONLY EQUALED

BY THE MAGNIFICENT CONTRIBUTIONS WHICH THEY HAVE MADE

TO THE CAUSE OF EDUCATION,

THIS VOLUME IS RESPECTFULLY INSCRIBED AS A CHEERFUL CONTRIBUTION TO
THE CAUSE WHICH WE ALL ADVOCATE IN COMMON, AND AS A
SMALL TESTIMONIAL OF THE ESTEEM IN WHICH
THEY ARE HELD

BY THE AUTHOR.

PREFACE.

THE following pages are intended to explain certain mathematical truths, which were discovered by the author while engaged in a series of investigations made during the hours of rest from the labors of the college and the counting room. They consist chiefly of new methods employed in the solution of problems which have heretofore been regarded by mathematicians as impossible; and, although the author's mind has been employed with the subject for a number of years, the result of the investigations are now published for the first time.

If the discoveries should not come up to that standard of brilliancy which *commands* attention, it is hoped that they may be found worthy of a fair and impartial consideration.

The author scarcely dares to hope, with the many examples of failure before him, that at the outset the entire mathematical world will bow in submission to his decree, or submit unconditionally to the power of his reason or the force of his logic; nor does he desire that the glorious fabric, which the mathematical genius of the world combined has reared as a monument to the memory of departed greatness, should crumble into dust by a single touch. Ah, no! Rather let the ivy of remembrance forever remain green upon their mausoleums, and the vines of gladness encircle their remains. But if *Genius*, while pursuing her walks amid these temples of departed greatness, should suddenly be inspired by *Wisdom*, and conceive *Truth*, who would be so poor as to refuse a garland with which to crown her brow, where truth sits enthroned?

The discoveries are as follows:

1. The Quadrature of the Circle.

2. A Common Measure of the Side and Diagonal of the Square.

3. An Infinite Series of Right-angled Triangles, with a Rule for their Solution.

For information concerning the History of the Quadrature of the Circle, the reader is referred to the Introduction, which begins on page 9, of this book. But before we proceed too far in our investigation of the subject, it seems proper to inquire first what is the circle. If a draughtsman or mechanic take an ordinary pair of dividers, and with one foot as a center, and the other starting at a certain point, cause it to describe a curve which is constantly receding upon itself, this point will return to the point from whence it started, when it is said to be an inclosed curve; and the curve, which is described by one point rotating around the other point within, is said to be the circumference of the circle, every point of which is equally distant from the point within; and this point within is called the center of the circle; and the plane figure which is inclosed by the circumference is said to be the circle itself. But a *mathematical circle* is more difficult to comprehend. If we say that to make a dot with a pencil that it is a point, the definition is sufficient for mechanical purposes; but a mathematical point has position only, and no magnitude, because it has no *size*. So, also, a mathematical circumference is a curved line constantly receding upon itself; but, like a mathematical straight line, it has *length only, without either breadth or thickness*. A mathematical circle, then, is a plane figure, which is inclosed by a curved line so finely defined as to be invisible, not only to the naked eye but by the means of the most powerful microscope which it is likely ever will be made, *yet its existence* can be as certainly determined, mathematically, as if it were drawn mechanically upon wood or paper, and not only its figure, but its dimensions, and consequently the ratio or pro-