

**THE PENDULOGRAPH: A SERIES  
OF BI-PENDULUM WRITINGS OF  
THE TWENTY RATIOS OF THE  
MUSICAL SYSTEM, OR SOUND  
SEEN IN THE SILENCE**

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The pendulograph: a series of bi-pendulum writings of the twenty ratios of the musical system,  
or sound seen in the silence by John Andrew

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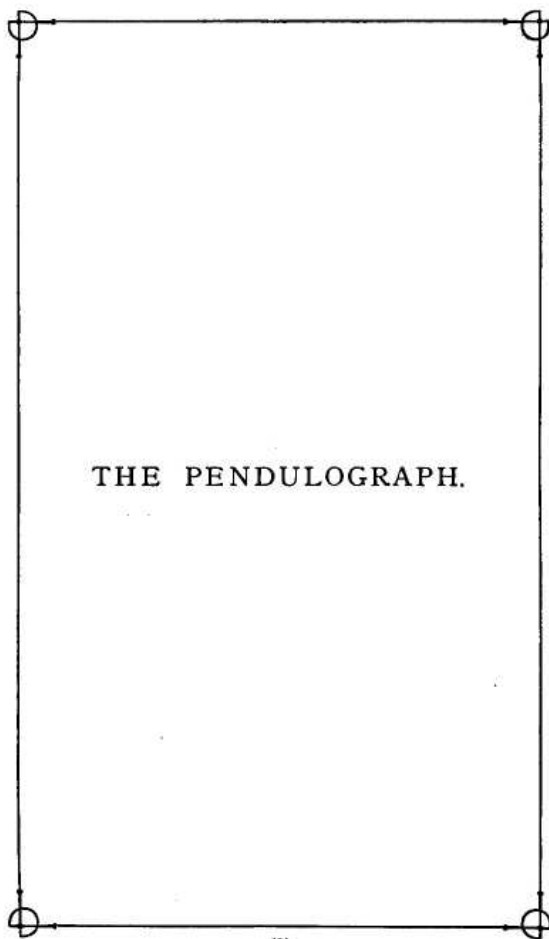
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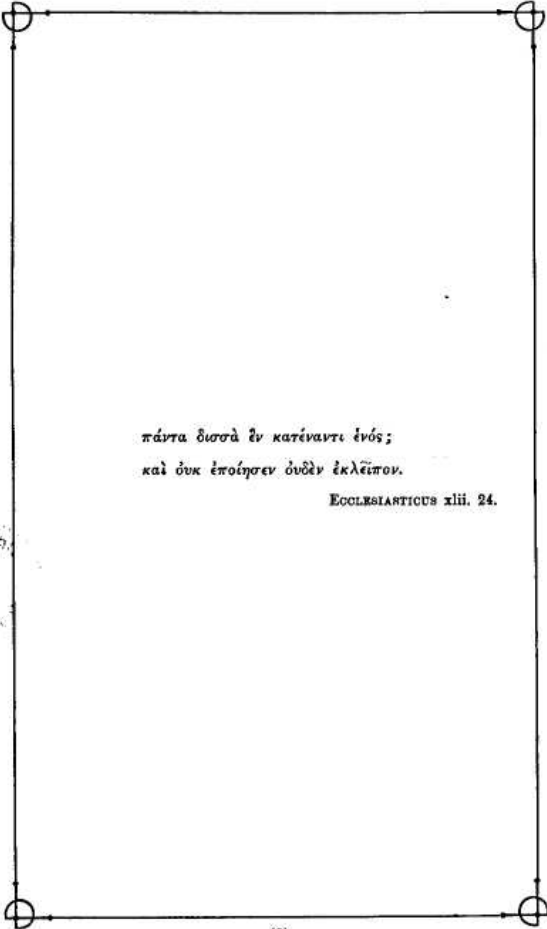
**JOHN ANDREW**

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(1)



πάντα διωσά ἐν κατέναντι ἐνός;  
καὶ οὐκ ἐποίησεν οὐδὲν ἐκλείπων.

ECCLESIASTICUS xlii. 24.

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OF THE

TWENTY RATIOS OF THE MUSICAL SYSTEM;

OR,

SOUND SEEN IN THE SILENCE.

BY THE

REV. JOHN ANDREW.

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"A THING OF BEAUTY IS A JOY FOR EVER."

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1881.

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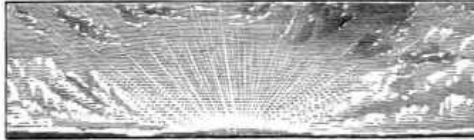
## Dedication.

UNCOUNSELLED ONE! whose Purpose to Create  
Upsprang within Thyself—upsprang in love,  
Which was its proper motion; ere as yet  
Was “The Beginning.” O Thou Word of God!  
Revealer of that fountal Purpose: Thou  
Whose part it is to manifest, and make  
Intelligible; marshalling in hosts  
The forms Thou puttest upon all things made  
In heaven and earth, “even all the hosts of them,”  
Kingdom and Class, Orders and Genera  
Of Species, whose types indelible,  
Stereotypes, “whose seeds are in themselves  
After their kinds,” are all, O Lord, of Thee.  
THOU BROODING SPIRIT! “Lord and Giver of Life,”  
Whose quickening force setteth the quivering pulse  
In every living thing. O THREE-ONE GOD!  
I dedicate to Thee, from whom it came,

*McVicar's Cosmical Law—"Assimilation."*

This little finding of Thy beauteous ways.  
Thou art Thyself the Secret of Thy works.  
Thou art the Key. Thine image bear they all  
Or more or less. And heaven-born Music, as  
Thine ordinance in air and ear, and in  
The balance of the force elastic with  
The gravitating force that holdeth all,  
Music the statute is which more than most  
Of all that stands on Nature's statute-book,  
Image and superscription—Three in One  
In interlacing monogram, doth show  
Of Thee: to whom we render it *as due*.  
Accept the Tribute.





### TREATISE ON VIBRATIONS.

THE air which lies about this beautiful and busy planet of ours is full of various motions; it is so sensitively elastic and so easily agitated. Forces great and small continually fill it—now with windy urgings driving it along in currents, now with gentle musical strokes setting it a quivering to and fro. It is these quiverings, usually called “Vibrations,” that produce musical sounds; and they are produced not in the still air only, but in the rolling currents of the storm as well. Many instruments have been constructed by man—strings, pipes, bells, drums, &c., for the purpose of producing those musical vibrations of the air so pleasing to the ear.

A vibrating string crushes back and condenses the elastic particles of the air now on this side of it and now on that; and as the string returns from this side and from that, the crushed air speedily recovers itself, following the retiring string, only to be crushed back again and again by every vibration of the string.

Some teachers on the subject consider a *vibration of a string* as the passage from extreme to extreme of the motion; and some consider it as the passage from extreme to extreme and back. D. C. Ramsay, of Glasgow, has shown his pupils reason to consider a vibration as the movement from the