Fourth Meeting, February 14th, 1896.

Dr PEDDIE, President, in the Chair.

Note on a Certain Harmonical Progression.
Note on Continued Fractions.
On Methods of Election.

BY PROFESSOR STEGGALL.

A Simple Method of Finding any Number of Square Numbers whose Sum is a Square.

BY ARTEMAS MARTIN, LL.D.

I.—Take the well-known identity

$$(w+z)^2 = w^2 + 2wz + z^2 = (w-z)^2 + 4wz \qquad - \quad - \quad (1).$$

Now if we can transform $4wz$ into a square we shall have *two* square numbers whose sum is a square. This will be effected by taking $w = p^2$, $z = q^2$, for then $4wz = 4p^2q^2 = (2pq)^2$ and we have

$$(p^2+q^2)^2 = (p^2-q^2)^2 + (2pq)^2 \qquad - \quad - \quad - \quad (2).$$

See *Mathematical Magazine*, Vol. II., No. 5, p. 69.

In (2) the values of p and q may be chosen at pleasure, but to have numbers that are prime to each other p and q must also be prime to each other and one odd and the other even.

Examples.—1. Take $p = 2$, $q = 1$; then we find

$$3^2 + 4^2 = 5^2.$$

2. Take $p = 3$, $q = 2$; then we shall have

$$5^2 + 12^2 = 13^2.$$

3. Take $p = 4$, $q = 1$; then we get

$$8^2 + 15^2 = 17^2.$$

And so on, *ad lib.*