Note on "Note on Smith's Definition of Multiplication." By A. L. Baker.

The rule should be: To multiply one quantity by another, perform upon the multiplicand the series of operations which was performed upon unity to produce the multiplier.

This does not mean, perform upon the multiplicand the series of successive operations which was performed upon unity and upon the successive results.

Thus, to multiply b by $\sqrt{a}$: If we attempt to consider $\sqrt{a}$ as derived by taking unity a times and then extracting the square root of the result, we violate the rule. To get $\sqrt{a}$ by performing operations upon unity, we must (e. g., a=2) take unity 1 time, .4 times, .01 times, .004 times, etc., and add the results. Doing this to b, we get the correct result, viz., $\sqrt{2}\ b = 1.414\ldots b$.

The rule is thus universal, applying to all multipliers, complex, quaternion and irrational.

The Geometry of Simson's Line. By C. E. Smith, Indiana University.

1. If from any point in the circumference of the circumcircle to a $\triangle$ ABC $\perp$s to the sides of the $\triangle$ be drawn, their feet, P_1, P_2, and P_3, lie in a straight line. This is known as Simson's Line.

(a) First proof that P_1, P_2, and P_3 lie in a straight line.

Since $\angle$ s PP_3B and PP_1B (Fig. 1.) are both right $\angle$ s, P, P_3, P_1 and B are concyclic.

Likewise P, P_2, A, and P_3 are concyclic.

Now $\angle PP_3P_1 + \angle PBP_1 = 180°$.

and $\angle PAC + \angle PBP_1 = 180°$.

$\therefore \angle PP_3P_1 = \angle PAC$,

But $\angle PAC + \angle PAP_2 = 180°$.

$\therefore \angle PP_3P_1 + \angle PAP_2 = 180°$.

But $\angle PAP_2 = \angle PP_3P_2$ (measured by same arc of auxiliary circle)

$\therefore \angle PP_3P_1 + \angle PP_3P_2 = 180°$, or a straight $\angle$.

$\therefore P_1\ P_3$ and P_2 lie in a straight line.