NOTE ON SPECIAL REGULAR RETICULATIONS.

BY PROFESSOR ELLERY W. DAVIS.

As in Professor H. S. White's first paper ( Bulletin, December, 1896) I write

\[ \rho = r - 2, \quad \sigma = s - 2, \quad F = (4p - 4)(\rho + 2)/(\rho\sigma - 4). \]

With the exception of cases like 5, 14, and 6, 12, for \( p = 9 \), it appears from the tables and is a direct implication of Professor White's mode of building up the reticulations, that whenever for a given \( p \) we have an \( F \) less than its corresponding \( V \), then there will also be found the same \( F \) paired with a \( V \) at most equal to it. But since \( F = V \), this is the same as saying that when \( \rho < \sigma \) for a given \( F \), for the same \( F \) we can also have \( \rho > \sigma \).

Let \( \sigma = \rho + K \). Then

\[ K = \frac{1}{Fp} \left[ 4(2p - 2 + F) + (4p - 4)\rho - F\rho^2 \right] \]

and \( \rho \) must divide \( 4(2p - 2 + F) \). If \( 2p - 2 + F = \delta \delta_2 \), \( \rho = \delta_1 \) or \( 2\delta_1 \) or \( 4\delta_1 \), where \( \delta_1 \) is any factor of \( 2p - 2 + F \) including both unity and \( 2p - 2 + F \).

\[ \rho = \delta_1 \text{ gives } K = K_1 = \frac{1}{F} (\delta_1 + 2)(2\delta_2 - F), \quad V = 2\delta_2. \]

\[ \rho = 2\delta_1 \text{ gives } K = K_2 = \frac{2}{F} (\delta_1 + 1)(\delta_2 - F), \quad V = \delta_2. \]

\[ \rho = 4\delta_1 \text{ gives } K = K_3 = \frac{1}{F} (2\delta_1 + 1)(\delta_2 - 2F), \quad V = \delta_2/2. \]

When \( F \), and therefore \( \delta_2 \), is odd, \( K_3 \) makes \( V \) a fraction; otherwise we have our choice of the three \( K \)'s. Should, for a given \( F \) and \( p \), one of the \( K \)'s become a positive integer but none a negative integer, no matter what factor were taken of \( 2p - 2 + F \), an exceptional reticulation would be before us.

Plainly when \( F = 1 \) or 2 we can always have \( K \) either zero or negative. When \( F = 2 \), however, and \( p \) is odd, \( F \) and \( p - 1 \) have the common factor 2 so that the reticulation is a derived one unless \( V \) is odd. If we put \( p = 2s + 1 \), \( \delta_2 = 1 \), we find \( K_2 = -4s - 1 \), and \( V = 1 \) so that the re-
LIMITATIONS OF GREEK ARITHMETIC.

BY ME. H. E. HAWKES.

(Read before the American Mathematical Society at the Meeting of April 30, 1898.)

I propose to discuss in the present paper the number system of the Greeks, and to show how their arithmetical notions were limited by their geometrical symbolism. My argument is based chiefly on Euclid's Elements. This is not a serious limitation, for, firstly, the Elements give us practically all that Greek mathematicians knew on the subject, prior to 300 B.C., and, secondly, little was accomplished in this direction during the following three or four centuries. We may, therefore, consider Euclid's theory of number as representative.

I shall first attempt to show that Euclid naturally ex-