94. A no., as 6, may divide the product of two nos. 4 and 9 without dividing either of them, for the reason that 6 is made up of two factors one of which is contained in 4, and the other in 9; but a prime no. cannot be broken up into factors and ∴ must be wholly contained in one or other of any two factors whose product is a multiple of it.

311

95. If a no. has been resolved into prime factors, any other set of factors can be formed only by breaking up or combining the factors already obtained, but prime factors cannot be broken up, nor can any combination of factors produce a prime factor.

96. See Arith., p. 135, no. 379, 380.

97. See Arith. p. 67, 68.

98. See Arith. p. 69, 70.

99. $\frac{1}{9} = .1111$&c. On dividing this by 9 it is easily seen that the successive rems. are 1, 2, 3, 4, 5, 6, 7, 8. ∴ the successive quots. are 0, 1, 2, &c., until the dividend 81 is reached when we have a quot. 9 instead of quot. 8 and rem. 9; &c.

100. Since 2 indicates 8 times as many units as it would indicate in the units place ∴ it must indicate 16 units wh. added to the 3 in the units place give 19.

101. 3 indicates 3 units; 2 indicates 4×2 units; and 1, $4 \times 4 \times 1$ units; $= 27$ units.

312

102. $1 + 5 \times 5 + 5 \times 5 \times 5 \times 5 = 651$.

103. $5 + 4 \times 6 + 3 \times 6^2 + 2 \times 6^3 + 6^4 = 1865$.

104. $\frac{125}{4} = 31 + \frac{1}{4}$; $\therefore \frac{125}{4^2} = 7 + \frac{3}{4} + \frac{1}{4^2}$; $\therefore \frac{125}{4^3} = 1 + \frac{3}{4} + \frac{3}{4^2} + \frac{1}{4^3}$; $\therefore 125 = 1 \times 4^3 + 3 \times 4^2 + 3 \times 4 + 1$.

105. From 104 this is 1331.

106. Dividing by 5 the successive rems. an 0, 4, 3, 3, 4, 3. ∴ the no. is 343340.

107. The successive rems. are 5, 7, 3, 6, 2.

108. 4321 in scale of $7 = 4(7^3) + 3(7^2) + 2(7) + 1 = 1554$. Or, divide by 10 successively and we get the rems. 4351. In dividing 10 into 43 bear in mind that this 43 is $4 \times 7 + 3 = 31$, and that the next rem. 1 taken with the $2 = 1 \times 7 + 2 = 9$, and