supposing the annual increase to continue 8 fold, what would be the produce of the 16th year, allowing 1000 kernels to a pint? *Ans.* 2199023255·552 bushels.

4. Supposing a man had put out one penny at compound interest in 1620, what would have been the amount in 1824, allowing it to double once in 12 years?

$2^{17}=131072$. *Ans.* £546 2s. 8d.

5. A man bought 4 yards of cloth, giving 2d. for the first yard, 6d. for the second, and so on in 3 fold ratio; what did the whole cost him?

$2+6+18+54=80$ pence *Ans.* 80 pence.

In a long series, the process of adding in this manner would be tedious. Let us try, therefore, to devise some shorter method of coming to the same result. If all the terms, excepting the last, viz. $2+6+18$, be multiplied by the ratio, 3, the product will be the series $6+18+54$, subtracting the former series from the latter, we have for the remainder, $54-2$, that is, the last term less the first term, which is evidently as many times the first series $(2+6+18)$ as is expressed by the ratio, less one; hence, if we divide the difference of the extremes $(54-2)$ by the ratio, less 1, $(3-1)$ the quotient will be the sum of all the terms, except the last, and, adding the last term, we shall have the whole amount. Thus, $54-2=52$, and $3-1=2$; then $52\div 2=26$, and 54 added, makes 80. *Ans.* as before.

Hence, when the extremes and ratio are given to find the sum of the series,—Divide the difference of the extremes by the ratio less 1, and the quotient, increased by the greater term, will be the *answer*.

6. If the extremes be 4 and 131072, and the ratio 8, what is the whole amount of the series?

$$\frac{131072-4}{8-1}+131072=149796. \quad \textit{Ans.}$$

7. What is the sum of the descending series 3, 1, $\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{27}$, &c. extended to infinity?

It is evident the last term must become 0, or indefinitely near to nothing; therefore, the extremes are 3 and 0, and the ratio 3. *Ans.* $4\frac{1}{2}$.

8. What is the value of the infinite series $1+\frac{1}{4}+\frac{1}{16}+\frac{1}{64}$, &c.? *Ans.* $1\frac{1}{3}$.