

HEADS FOR FIGURES.

FEATS OF MENTAL ARITHMETIC THAT
PUZZLED THE SCIENTISTS.

Two Untaught Phenomenons. Ignorant on All Other Subjects, Who Could Solve Offhand Difficult Problems in Mathematics.

Jedediah Buxton, an English farm laborer, was an untaught mathematical genius. Although his grandfather was vicar and his father schoolmaster of the parish in which he was born, yet Jedediah, either from natural incapacity or from preoccupation with his arithmetical pursuits, never even acquired the rudiments of learning, either could not or would not so much as learn to write and was content to work as a farm laborer to the end of his days. But at a very early age he appears to have had an intuitive perception of the relative proportions of numbers, and to this subject he devoted the whole of his attention. His method was so much his own that he seems to have been quite unacquainted with the common rules. On one occasion, having been required to multiply 456 by 378 and having done it as quickly as one of his examiners could do it in the ordinary way, he was asked to work the sum audibly, in order that his method might be discovered. It then appeared, curiously enough, that he went to work in a very roundabout way.

First he multiplied the 456 by 5, which produced 2,280; this he again multiplied by 20 and found the product to be 45,600. Of course, he might much more readily have achieved this result by simply adding two naughts to the multiplicand. This he evidently did not know. However, he next went on to multiply the number he had now arrived at by 3, which gave him the sum of the multiplicand multiplied by 300, and it then remained for him to multiply it by the remaining 78. This he effected by the awkward process of multiplying by 15 the 2,280, which was the product obtained by his first multiplication of 456 by 5. The product thus obtained he then added to the 136,800, which was the sum of 456 multiplied by 300. This produced 171,000 as the sum of 456 multiplied by 375. It remained for him, therefore, to multiply the original number again by 3 and add the sum of it to 171,000. And by this certainly rather cumbersome process he found the product of 456 multiplied by 378 to be 172,368.

Jedediah had no more general knowledge than any average peasant boy of 10 years of age and showed no memory for anything but figures. He was sometimes asked when he returned from church if he could repeat the text or any part of the sermon, but he could never remember a single sentence. In 1754, when he was 47 years of age, Jedediah walked to London to see the king. He was entertained and exhibited to the Royal Society, but he left London without a regret and returned cheerfully to his farm work.

Another untaught arithmetical genius, Zerab Colburn, whose abnormal development raises an interesting problem, was the son of an American peasant. He was brought to London by his father in 1812, when 8 years old, when he was examined and his peculiar powers were tested by Francis Baily and other skillful mathematicians. It was found that, although he was so ignorant of the ordinary rules of arithmetic that he could not perform on paper a simple sum in multiplication or division, yet he could mentally multiply any number less than 10 into itself successively nine times and give the results faster than the person appointed to record them could take them down. He multiplied 8 into itself 15 times, or, to use technical terms, raised it to the sixteenth power, and the result, consisting of 15 digits, was found to be right in every figure. This was astonishing enough, but he was able to do things even more wonderful. When asked what number multiplied by itself gave 106,929, he answered, before the original number could be written down, that it was 327. And, again, when asked what number multiplied twice into itself gave 68,336,125, or, to put it technically, what was the cube root of that array of figures, he replied with equal facility and promptness that it was 645. The mathematical experts who were examining the boy found that it was impossible to find the cube root of these nine figures, in the shortest and most convenient way, in less than three or four minutes.

But what most surprised the mathematicians was that he could almost as readily answer questions for which they had not been able to provide any systematic procedure themselves. For instance, he

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was asked to name two numbers which, multiplied together, would give the number 247,483, and he immediately named 941 and 263, which are said to be the only two numbers which will do so. And when asked to name a number which would divide 36,083 exactly he unhesitatingly replied that no number would do so. If any of our mathematically minded readers will address themselves to this problem, they will find that it will give them at least a quarter of an hour's still calculation before they can assure themselves that 36,083 is what is called a prime number, or a number only divisible by itself and unity, a solution which this child was in some mysterious way able to see immediately the question was proposed to him.

Colburn, like Buxton, seems to have had a method of his own, but he constantly declared that he did not know how the answers came into his mind. "God put these things into my head," he said on being pressed for an explanation, "and I cannot put them into yours." Jedediah lived to the age of 65 with no more general knowledge or stock of ideas than a child of 10, and he kept his extraordinary calculating faculty to the end. But Zerab, the general culture of his mind improved, found his special power to fade away. Francis Baily was of opinion that Zerab Colburn's feats indicated the existence of certain properties of numbers which mathematicians had not yet discovered. But it is perhaps equally possible that they indicated capacities of the human mind which had hitherto been undreamed of.—London Globe.

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