PSYCHOLOGY

L. SELF-TAUGHT ARITHMETIC FROM THE AGE OF FIVE TO SEVEN AND A HALF

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(Abstracted)

This paper is an attempt to describe and to discuss the processes in the workshop of a child's mind in the realm of arithmetical thought.

The arithmetical equipment of the boy A. at the age of five years and one month, is given in "Numbers, Space and Time in the First Five Years of a Child's Life," by Sophie R. A. Court (Pedagogical Seminary, March, 1920).

Two weeks later he suddenly began to count by fives, without any provocation from the outside and without knowing, just what he was doing. He was fascinated by the rhythm and counted in a sing-song up to twenty. A few hours later he discovered, by an intuitive process, that it was by fives that he was counting, and verified this discovery empirically by counting on his fingers. For several weeks he enjoyed counting by fives, gradually increasing his scale, until three weeks later he counted well till two hundred, and at the age of five years, nine months, could count by fives and twos correctly and rapidly ad infinitum, as it seemed—having learned the counting by twos in the same spontaneous way.

He also often counted by tens, and enjoyed the "joke" of saying after ninety, "tenty," "eleventy," "twelfty."

He was less interested in computation, yet often did little additions—within ten or fifteen—mentally, on his blocks, on the typewriter, and, later, from the age of five and a half, in writing.

Hearing that odd and even numbers of houses are on the different sides of the street, he became interested in recognizing, which numbers are odd and which are even.

All the time under consideration, as before, he was greatly interested in measuring and used every opportunity to take linear measurements, to find out capacity of utensils, to weigh different objects, to measure depth of water in bathtub or basin, etc. Also compared fractions on a measuring cup, and taught himself, 1-3, 1-8, 1-10.

He liked to tell time, and at five years two and a half months

begin to teach himself reading time in minutes and expressing it in phrases used by adults.

At the age of six he taught himself to read the thermometer.

At the age of six and a half he was given a few music lessons, which were soon discontinued. A year later he received as a gift music blocks. For several days they absorbed him entirely, but he played with them in one exclusive way; he practised on them the different ways of making a measure of 4-4 out of notes of different values.

At six years four months he became interested in geometric figures and for about three months was studying the circle, the triangle, the square, the rectangle in the same intense way, in which he studies everything that interests him.

The arithmetical facts in his possession led him to much independent thinking of philosophical nature. Thus, he became greatly interested in the zero at the first acquaintance with it, at the age of four and a half, and, beginning with the age of five, amused himself often with jokes of his own invention about the zero. At five years, five months he wrote—

0 plus 0 equals 0,

a "joke" of his own making.

At six years, eight and one half months he came to the conclusion, that eight from two leaves "six below zero."

Yet, with all these abilities and interests, he is not brilliant in arithmetic at school—there always have been others of far better standing. His strength lies in reasoning and in contemplative thinking, and he, therefore, grasps every new stage in arithmetic with surprising ease and clearness. But he is not a natural computer, and his accuracy comes only after some practice, and his speed is hardly ever above the average. Perhaps this is due to lack of practice, for school arithmetic never awakens in him the interest and the inspiration that his own self-taught arithmetic arouses.

The above facts shed some light on the question of systematic versus inspirational work; on the difficulties and importance of proper balance between emphasis on nature and nurture; on the lockstep method of class teaching; on the reasoning powers of children; on the role of intuition in discoveries.