



Dr. Robert Megginson – Mathematician

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“Hey, by the way...”, his eyebrows would go up and his eyes would brighten. I can still remember the way my teacher, Mr. Donald Haberkorn, would change the direction of our conversation. He was introducing me to a mathematical idea in a way that would cause me to spend hours working on it. I could tell how excited he was to share this new idea with me. I didn’t get the feeling that Mr. Haberkorn was involved in teaching me something either. Rather, he, an adult and a teacher, seemed truly interested in his subject, mathematics. And it was a joy to him to find a student who was interested. Not only did these conversations introduce me to a realm of study that would later occupy the greater part of my life, but they also had another, very unexpected result. It made me feel good about myself. If this adult was willing to spend so much time discussing this subject with me,

then I realized I must be a valuable person. Teachers can have such a powerful influence on their students. I was very fortunate to have such a person in my life.

My mother is from the Lakota tribe, and life wasn’t always so cheery for an Indian kid in a small rural school. When I was a child, the Indian stereotypes from the Western movies were still very strong. Some teachers and fellow students didn’t believe that Indians would need education or that Indians would eventually compete for the top jobs in our society. One year I ended up in the “slow” section of the class just because of my Indian background.

Looking back at my high school days, I am able to remember an important idea that Mr. Haberkorn taught me each year that I was in high school. Since it was a small school, I had the same math teacher all four years. In my freshman year he introduced me to the principle of mathematical induction, which is commonly called the “domino principle.” Counting the number of ways that something can be done is a very common problem that scientists encounter. For example, suppose that we want to check what the sum of the integers between 1 and 100 is. Carl Friedrich Gauss, a famous 19th century mathematician, was asked this same question in his first arithmetic class when he was only eight. To the astonishment of his teacher, he quickly came up with the answer (it is 5050). The formula for computing the sum of all the integers between 1 and another given integer n is

$$\text{Sum} = n * (n + 1)/2.$$

The principle of mathematical induction gives mathematicians one way to prove that this formula holds for any positive integer n . Mathematical induction is such a powerful tool that it is used by mathematicians and computer scientists alike as they attempt to solve problems such as the Traveling Salesman Problem. For instance, let’s say that a salesman has to visit 5 different cities. What is the best route that he should take so as to visit each city exactly once, keeping the total travel distance to a minimum? What if the number of cities the salesman needs to visit increases to 8? 10? 20? Mathematical induction helps us ponder this question, as well as countless others.

Looking back at my life, that simple “Hey, by the way...” had a domino effect in my life. Powerful ideas made a barrier fall down, then another, then another....