

LET ME COUNT THE WAYS (WITH APOLOGIES TO ELIZABETH BARRETT BROWNING)

*“Reeling and Writhing, of course, to begin with, “the Mock Turtle replied, “and the different branches of arithmetic – Ambition, Distraction, Uglification and Derision”
Lewis Carroll*

The following story is dedicated to my wife Nikki. The reason will become obvious upon reading this epistle.

Dr. Primus Raisone was quite nervous. For the first time in his career, he was about to make a presentation to a prestigious group of mathematicians amongst whom were a number of Nobel Laureates as well as some very prominent Statisticians and other Mathematicians of various stripes. He was a small, rather shy man without charisma, very diffident and self-effacing in manners. The presentation had been given a great deal of hype for reasons unknown to Dr. Raisone. Everyone was expecting a revolutionary discourse with radical new insights. His lack of self-confidence was preying upon him. He only hoped that he would not be laughed out of the hall.

Actually, Professor Raisone's secret passion was counting. Since early childhood he had an obsession with counting things. He counted the candies in his candy box, the pennies in his piggybank, the stars that he could see in the sky, the number of days remaining in the school term, the number of his fellow students by sex, hair colour, height, those that did better than him in all scholastic and athletic endeavours and anything else that he could dream up. One subject in which he excelled was arithmetic. However, he was too shy to boast about his prowess in this area. Since counting involves numbers, inevitably he learnt something about them and their properties. Upon entering university he honoured in mathematics, choosing statistics as the subject closest to his likings. Literally speaking, he had one interest and one interest only. He devoted all his time to his studies and graduated at the top of his class in record time, whereupon he was appointed to the math department of a prestigious University, first as a lecturer and then with quick promotions to full professorship.

One of his prime areas of interest was the census. Behind the scenes and known only to a few, he played a major role in modifying the means of counting people on a statistical sample basis. This saved the government a great deal of time and money. Despite this and because of his retiring nature, he did not receive the accolades he merited. Again, only a few in his department and in government knew of his talents but did not attempt to promote him in any meaningful fashion, perhaps because of professional jealousy, or perhaps he had become the invisible man.

However, those few aware of his merits, encouraged him to acquire jobs in which they had no interest. Jobs such as counting votes during elections, stock mergers and for entertainment awards frequently came his way. He developed a reputation for accuracy and honesty. He also spent a great deal of his spare time researching means to count that were far more accurate and faster. Little was it realized that these activities were ones he thoroughly enjoyed. They were also quite remunerative. His University encouraged him, probably because they received a percentage of what his sidelines earned. No one foresaw what was about to occur.

He entered the auditorium and waited near the exit doors until his Department Head entered, whereupon he went to the podium and sat down. The number of personages present in the hall startled him. His superior introduced him in a rather perfunctory fashion as if he were of no importance whatever, whereupon he arose and very quietly started to talk. He spoke without any notes or visual appurtenances. What follows is an edited version of his address. All highly technical matters have been deleted. What has been included is the pith of his thoughts, some of the responses from the audience and interactions with its members.

"I would like to start by stating how honored I am to be here speaking before such a distinguished group. I have attended many conferences, seminars and symposia where many present today have made extraordinary innovative revelations. I doubt that I can match the contributions of these most eminent persons and their intellect. I know that very few of you were even aware of my existence and even fewer of my obsessive interest in my topic which, simply put, is about the crucial role of 'counting' in our world. I can only hope that you will bear with me and not be bored. Actually, this is the first time I will have ever made any type of presentation other than to my students. Even with them, I prefer to dialogue as I do with you. Please do not hesitate to interrupt to comment or to question anything I say.

First of all, let us state the obvious. Counting is a form of measurement and perhaps when possible, the most accurate means of accomplishing that task. I am sure that most of us, and that includes those of us who should know better, do not realize how counting pervades our life. For example, time is constantly being measured. We set an alarm clock to wake us in the morning at a particular time. We allow ourselves to measure the amount of time to shower, shave, dress, eat breakfast and get to work. We are keenly aware when coffee, lunch breaks and quitting times occur. Again we measure the time it takes getting home, cooking, going out for the evening, returning home, and retiring. Frequently, we do not measure the distance between two locales but the time it takes to get from one to the other depending upon the means of transport. Other things we often measure are the amounts of food we consume, as well as their caloric content, the temperature inside and outside our homes and that of our bodies, which in turn usually determines what we wear. By now, I'm sure you realize that I could go on indefinitely with more examples of how all-important and how unappreciated the counting is that we do.

Of course, measurement is the basis of most if not all scientific experimentation. Again this is a form of counting. Some constants in nature with which we are all familiar, are numerical and one way or another had to be measured. Some examples are the speed of light in a vacuum, the ratio of the circumference to the diameter of a circle, the number of atoms in a gram atomic weight of any element-a constant known as Avogadro's Number, the Gravitational Constant and acceleration due to gravity. Statistics and epidemiology are scientific tools that are essential and certainly are based on counting. Astronomy measures distances in light-years. Differential equations, perhaps the most important tool in physics and chemistry are nothing more than an elaborate means of measurement.

In essence, what I am trying to say is that counting is or ubiquitous but unacknowledged. It is probably the most important thing we do. I will not quarrel with anyone who suggests that counting or reducing so much to that activity is boring and mundane. I simply do not agree."

Dr. Raisone stopped to clear his throat and take a sip of water. Dr. Argus, who had been sitting impatiently leapt to his feet and interjected. "I have been listening to you with a great deal of forbearance. I find that in reducing all that we do or nearly all that we do to counting is insulting and patronizing. You have reduced us all to being nothing more than Certified Public Accountants. While that is a useful profession, it does not encompass the beauty, harmony, knowledge and utility of what we do. It is a dry and for the most part pedestrian vocation. It is of interest to us only when we are trying to pay as little taxes as possible."

"Actually, very few of us have the skills to be Certified Public Accountants" Dr. Raisone uncharacteristically retorted. "With the human condition being what it is perhaps we would be better labelled Certifiable Public Accountants. In any case I have not gotten to the meat of the gist of what I wish to put forward."

About two years ago, my neat world of counting came crashing down with quite a thud. I became familiar with, firstly, Godel's Theorem. Essentially, it states that within any mathematical system there are contradictions that cannot be resolved from within the system. Then I learned about Heisenberg's Uncertainty Principle, which asserts that there is an irresolvable degree of uncertainty associated with any measurement. Finally, I became cognizant of Chaos Theory, which limits the ability to predict the future of complex systems because of the large number of variables involved, each of which can be described with a differential equation whose exact solution cannot be calculated but only approximated. This, in turn, inevitably leads to a great degree of uncertainty about what will occur if the variables are changed. Another complicating factor was the fact that it is impossible to measure anything that involves irrational numbers. For example, the area of a circle (πr^2) cannot be measured with total accuracy, even when we discount the Uncertainty Principle because π is an irrational number. I know that you are all familiar with the aforementioned, but you must realize that these areas of science and mathematics were mostly alien to me. Well sometimes the neophyte is able to perceive truths that the expert is blind to.

I realized that my obsession with numbers, counting and measurement had been largely based upon my illusory childhood fixations and not realistic knowledge. Despite this, I spent a great deal of time trying to affirm that numbers and thus counting are fixed laws of nature. The more I tried, the more depressed I became.

What saved me was my wife. I first met her when she approached me during my severest depression and managed to get me thinking about other things, namely romantic ones. I am aware that I do not cut a dashing male figure and that I was always too shy to approach any member of the opposite sex. To this day I do not understand what she ever saw in me. I thank my lucky stars that she did. I became and still am engrossed in our relationship. She filled a void in my life, one that was always devoid of any real nurturing warmth, affection and true love.

Well, what does my love life have to do with anything, in particular what I am doing here today in front of you? The answer is everything. I awoke one morning in a state of bliss, with my wife asleep beside me. Gazing at her, I was reminded of Elizabeth Barrett Browning counting the ways she loved her husband. I suddenly realized that either there are an infinite number of ways or in fact only one. I opted for the latter because I felt and still do, that love is not amenable or reducible to analysis. As far as I am concerned, my

wife and I are joined at the hip and are an example of when one plus one equals one. I am sure there are others in love that feel the same way. In any case this obviously breaks a basic law of arithmetic.

This revelation reminded me of an underlying tenet of quantum mechanics. Each thing in the universe is linked to all others and that therefore all is a unity. If that is so, then there is only one true number and that is the number one. However this is a half-truth. Either reality confirms the existence of existence or it does not. Therefore there must be another true number, namely zero, affirming non-existence. It follows that there are two possibilities, which can either be designated by the number one or the number zero. I am not a cosmologist. I cannot know what the possibilities of each occurring are. In the reality of the occurrence of the absence of existence, we must categorically accept the fact that time would disappear too. Contrary to a famous dictum, it appears that God may, in fact, play dice with the universe."

At this point, bedlam ensued, making it impossible for Dr. Raisone to continue. He was vilified and condemned by most. Only members of a small group were either supportive or wished to take the time to give his suppositions consideration.

A couple of thousand years later a singular event occurred.....

AND THEN THERE WERE NONE – WITH APOLOGIES TO AGATHA CHRISTIE.

Jack Basuk
March 24, 2002
<http://www.jackbasuk.com>