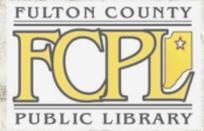


# Ath·e·nae·um

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She was unstoppable. Not because she did not have doubts or failures, but because she continued on despite them.

-Beau Taplin



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## Keep Calm and Carry On



“Happiness is the absence of striving for happiness,” says ancient Chinese hermit Chuang Tzu. Statements like this always seem fairly paradoxical to a Western mind set in motion by various philosophic theories that have taken hold in our time and culture. He continues, “The individual who has attained humility employs his mind as a mirror; it grasps nothing, refuses nothing, receives everything, yet does not claim ownership of anything.”

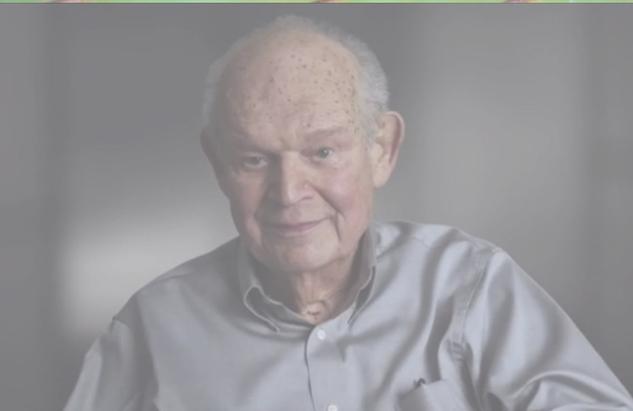
It is interesting to observe my own behavior and work towards an understanding of human nature in general. When I was just a boy I seemed to understand the simplicity of doing my work, then letting things go. I didn't try to control, manipulate, respond, critique, compare, compete, or quantify. The t-shirt says it best, “Keep calm and carry on.” I suppose this is easier said than done, but it is imperative to the health of the intellect. It doesn't imply not learning, it simply suggests, rather, not obsessing.

The mind seems to naturally have an incessant desire to compare and compete. It is easy to see this with the state, as well as federal governments, educational institutions, and even in family life. There is an interesting mystery inside this riddle. Over time, if you simply keep calm and carry on, its quite astounding how much progress can be made in any discipline. “Life is like riding a bicycle,” says Einstein, “you have to keep moving so you don't lose your balance.” So what is it that dams up our movement?

Movement is ceased intellectually when attempting to qualify work against some “ideal” context. Why the mind wishes to do this seems a matter of self-esteem. Similarly, there seems to be an innate desire to find some metric to gauge one's work by. This is set in motion by a “judge” who doesn't seem to understand the nature of chaos theory and fractals (see reverse side), still thinking in terms of stagnant space, reverencing Isaac Newton's “divine watchmaker” error. If you wish to begin a study in modern mathematics and subsequent quantum physics begin with Gottfried Wilhelm Leibniz. It is with he that we transition from an architectural view of the universe, to an understanding that all is movement. In him we find a Nietzschean “yea saying” to life, rather than the descent of quantification.

Keep calm and carry on, or slow and steady wins the race. History has taught us many lessons, science has revealed to us many mysteries, but after all in studied we have arrived at a simple submission of the mind. We have come to see the infinite complexity of chaos and the darkness cloaking it. What can we learn from unknowing?

# Foundation of Modern Math: Fractal and Chaos Theory



Benoît Mandelbrot was the first to define fractals

While most traditional science deals with supposedly predictable phenomena like gravity, electricity, or chemical reactions, Chaos Theory deals with nonlinear things that are effectively impossible to predict or control, like turbulence, weather, the stock market, our brain states, and so on. Chaos is the science of surprises, of the nonlinear and the unpredictable. It teaches us to expect the unexpected. These phenomena are often described by fractal mathematics, which captures the infinite complexity of nature. Many natural objects exhibit fractal properties, including landscapes, clouds, trees, organs, rivers etc. and many of the systems in which we live exhibit complex, chaotic behavior. Fractals are a never-ending pattern.

Fractals are infinitely complex patterns that are self-similar across different scales. They are created by repeating a simple process over and over in an ongoing feedback loop. Driven by recursion, fractals are images of dynamic systems – pictures of Chaos.

*The Butterfly Effect:* This effect grants the power to cause a hurricane in China to a butterfly flapping its wings in New Mexico. It may take a very long time, but the connection is real. If the butterfly had not flapped its wings at just the right point in space/time, the hurricane would not have happened.

*Unpredictability:* Because we can never know all the conditions of a complex system in sufficient (i.e. perfect) detail, we cannot hope to predict the ultimate fate of a complex system.

*Mixing:* Torque ensures that two adjacent points in a complex system will eventually end up in very different positions after some time has elapsed. Example: Two neighboring water molecules may end up in different parts of the ocean or even in different oceans. Mixing is thorough because torque occurs at all scales. It is also nonlinear: fluids cannot be unmixed. To understand the nature of Chaos and Fractal theory it is essential to gaze into the unknown.

*Order/Disorder Chaos:* Chaos explores the transitions between order and disorder, which often occur in surprising ways. What once did appear to the human eye as order is now viewed in myriad ways that reveal apparent chaos. It is quite astounding with modern technology to observe what once was viewed as order, is now observed as unpredictable.

I am a forest, and a night of dark trees: but he who is not afraid of my darkness, will find banks full of roses under my cypresses.

Friedrich Nietzsche



Darkness within darkness.  
The gateway to all understanding.

~ Lao Tzu