Bookplate Story, Arthur Jaffe, March 11, 2023 at CoV

Today I bring two books to show you; they are embellished in a wonderful way on which I will focus.

The first book concerns physics; the second is about mathematics. In fact, the second has circled this table before, when I explained how the author, Julian Lowell Coolidge was responsible, around 1910, for putting Harvard University onto the world stage of mathematics. Both his son John Phillips Coolidge, and his uncle Thomas Jefferson Coolidge (whose autobiography is now in the CoV library), were CoV members.

Mathematics can be characterized by “beauty,” and physics by “truth.” A perennial debate revolves about whether mathematics and physics remain happily married or live together in a petulant relationship. But what better symbol of the unity of these realms exists, than the golden ratio—whose origins precede Euclid in 300BC? This number is the limit of the ratio of successive Fibonacci numbers. Throughout history, the golden ratio has fascinated mathematicians, philosophers, scientists, musicians, artists, designers, and craftsmen.

Let me give two contemporary examples: When I mentioned the golden ratio last Monday to my daughter, an artist with us related how she used the Fibonacci numbers to design the color gradients in her tapestries. And not long ago I attended a music festival in the Swiss mountain town Braunwald. The composer Bartok sometimes spent his summers there in the Hotel Todiblick. A plaque outside the hotel celebrates the fact that in 1936 Bartok composed his most famous work, “Music for Strings Percussion and Celeste” in that place. My musical friends insisted that I write in the guest book about Fibonacci numbers and the golden ratio--as musicologists believe that Bartok used them in his composition.

The golden ratio φ is $\frac{1+\sqrt{5}}{2}$ =1.61803398874989….. The series is endless, so to attempt to finish the entire story would take longer than my lifetime. So let’s not continue with that! The golden ratio is the solution to a quadratic equation $\varphi = \frac{1}{\varphi} + 1$. This shows that the digits of the golden ratio and the inverse of the golden ratio are the same—except for the first “1”. Also, the golden ratio happens to equal the first “index” number $\varphi = 2\ cos\ \frac{\pi}{5}$, in a series of indices discovered by mathematician Vaughan Jones to classify knots. (I often wonder whether the next Jones index $2\ cos\ \frac{\pi}{6}$ also appears in nature.)

Let’s return to the embellishment of these books. It is a **bookplate**, which Tom Boss encouraged me to have. The idea to bind beauty to truth inspired John Kristensen to encircle them with a symbolically endless rope, woven from the magic digits of the golden ratio and its inverse. This does the job perfectly, yielding a simple, effective, and elegant design. I now pass around John Kristensen’s masterpiece for you to appreciate!

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Mathematics & Physics

Arthur Jaffe

Beauty & Truth