

“When one tries to depict the figure formed by these two curves and their infinity of intersections, these intersections form a kind of net, web, or infinitely tight mesh. Neither of the two curves can ever cross itself, but each must fold back on itself in a very complex way in order to cross the links of the web infinitely many times. One is struck with the complexity of this figure that I am not even attempting to draw. Nothing can give us a better idea of the three-body problem.”  
—Henri Poincaré (~1890)

“A very small cause which escapes our notice determines a considerable effect that we cannot fail to see, and then we say the effect is due to chance.

“If we knew exactly the laws of nature and the situation of the universe at the initial moment, we could predict exactly the situation of that same universe at the succeeding moment.

“But even if it were the case that the natural laws had no longer any secret for us, we could still only know the initial situation *approximately*.

“If that enabled us to predict the succeeding situation with the same approximation, that is all we require, and we would say that the phenomenon had been predicted.

“But it is not always so; it may happen that small differences in the initial conditions produce very great ones in the final phenomena.

“A small error in the former will produce an enormous error in the latter. Prediction becomes impossible and we have the fortuitous phenomenon.”

—Henri Poincaré : Science and Method (1914)

For want of a nail, the shoe was lost;  
For want of a shoe, the horse was lost;  
For want of a horse, the rider was lost;  
For want of a rider, the battle was lost;  
For want of a battle, the kingdom was lost!  
And all for the want of a horseshoe nail.

—John Gower (1390), For Want of a Nail

“The mathematical intuition so developed ill equips the student to confront the bizarre behavior exhibited by the simplest nonlinear systems, such as [the logistic map]. Yet such nonlinear systems are surely the rule, not the exception, outside the physical sciences.

Not only in research, but also in the everyday world of politics and economics, we would all be better off if more people realized that simple nonlinear systems do not necessarily possess simple dynamical properties.”  
—Robert May (1976)

“Yorke’s paper was important on its merits, but in the end its most influential feature was its mysterious and mischievous title: ‘Period Three Implies Chaos’.”

—James Gleick : Chaos