

The Tree of Snails

We know little of the Old Testament prophet Isaiah. Saul, David and Solomon were near contemporaries of Homer, Agamemnon and the heroes of Archaic Greece whose deeds and works have abundantly come down to us. Isaiah and the kings he served lived from 750-700BC in the ancient Dark Age that for us intercalates six hundred blank pages between the Heroic and the Periclean.

Clearly Isaiah was a man of affairs in the thick of Semitic politics of which he provides a few lugubrious glimpses. His gentle view of animals lends him an immediate sympathy to myself and many other late twentieth-century readers. The celebrated Eleventh Chapter of Isaiah praises The Peaceable Kingdom and this alone has made him an old Quaker favorite who inspired the brushes of American Primitives like Edward Hicks as well as allied Romantics such as Blake.

Animals play their innocent part in his vibrant chiaroscuro of Good and Evil as the ringing Promises of God reverberate through the timeless majesty of pages which no transliterative banality can mar. In this last respect Isaiah shares the tone of The Gospels, in which the reader senses, in whatever sorry rendition, that a god is speaking. And it is of course for his strange adumbrations of the earthly journey of Our Savior that he has been retained in the Christian canon.

April the Twenty-Eighth 1998. The manageress of my Wife's club telephones Jana. Would she like to join in a dance round the maypole on Mayday? My Wife is a good gymnast but a better Catholic and decides to take a rain check on that one. I am not an expert on maypoles but I understand that two contrarotating arbors surmount the pole and that dancers process in opposing circuits, though should the arbors bind the dancers spiral to the tree. I am not sure that I understand the ritual meaning of this, if any. One is compellingly reminded of the concentric and spiral designs carved upon megalithic tombs in Ireland and elsewhere, some of which may date to 3000BC. I have it on authority that such geometries are conjured in the shamanic hallucinations induced to this day and reflected in ethnic art. Whatever the case, concentric and spiraling figures are allied and are very ancient conceptions.

Christianity came late to Mercia and was not welcome. Even after one thousand years the attitude of the local people to the new religion remains ambiguous. I work in a town whose name still celebrates the chief of the old gods whose fane crowned the hill guarding the center of England as his name still centers the English week. Hopkins and other nasty witch-finders prospered upon this plateau, but even now lurid rumors persist of waifs as diverse as Nazi parachutists and black mares suffering lethal ill-use in night-sequestered coverts.

Readers "of a certain age" possibly recollect Meon Hill and the notorious crime that baffled Fabian of the Yard. Forensic historians and Conon Doyle fans will know of The Case of George Edalji, played-out within walking distance of my house, and still technically an unsolved mystery.

May the First 1998. A cold North wind blew down the Southernmost Pennine scarps shimmering the unkempt locks of ungrazed grass whose polished blades glanced like squall-stroked ripples in the sunlight. Further afield the Friesians of dandelion-dotted pastures sheltered behind the drystone dykes as lambs and ewes hunkered in the growth. In the valley below the walled and glaucous lawns of The White Peak yielded to the hawthorn hedges of Midland meadows.

The long-lorn hummocks of two short straight rakes showed where men had grazed for lead. But all flesh is grass^a and the flesh that stays grazes without bruising.

Jana, Sung Woo and I returned along the gentle grade of the old railway to Tissington. At Alsop-en-le-Dale we entered a sheltered cutting in the limestone and found a young and lissom birch sprouted beside the trackbed. Its sturdy young trunk and slender branches seemed to crop at random from their feral substrate like facts that happen without reason but are solid none the less.

At first we admired what seemed no more than our favorite tree, the paper-barked Silver Birch^b. As our eyes grew accustomed to its peeling integument we found to our astonishment a graceful snail clinging at eye-level to the trunk. Then we saw another and presently descried a dozen or a score also populating the branches. All sorts of snails. Some sported Great Western livery of chocolate and cream as they recycled the Dinantian^c in their perfect air-spun volutes. Some of these silent creatures had straw and silver swirls like the etiolated grass of winter to grace their tender backs. Why they climbed so far to such heady extremities was not immediately clear. But presently we detected lush and virid fields of epiphytic algae clinging to the bark. The little molluscs did not, however, graze these preferring to harvest more recondite herbage invisible to us.

Below the spreading branches some of the tiny toilers bestrewed the ground. Some were set at nought by gusts that had dislodged them as they essayed to cross smooth ground or the precarious traverses of undersides. Others had been torn from their Eiger by little raptors who had winkled them outwith.

Did the snails know that this birch was one of many, and that there were an almost infinite diversity of other substrates different in kind? Did they know of the far stars above or the distant sea or the exotic lands beyond? Were they aware that although all birches share a common program that no two are alike in their phenogenesis?

The snails strived to feed of the tree. They evolved the splendid symmetries of their shells from the disordered substance of its lawns, each *decus et tutamen*.

Each one of us grazes a tree of experience upon which we elaborate the structure of theory, our guide, our ornament, our shield.

But as fall the snails so the theories of men. Some plummet almost silently as they negotiate the slippery undersides of conjecture as phlogiston fell to the ice-shod clockwork of the young Davy. Some fall to a swift and silent swoop from the screaming skies like the geocentric epicycles of Ptolemy to the revolution of Copernicus; and their fragile spirals strew the dust with gaudy splinters. For all evolution is theory and all theories evolutions. God did not ask whether Huxley's grandmother was an ape or else his grandfather, for God knew that Huxley's mum and dad were *both* apes, and knew that we are all God's Children; and God is no monkey.

But God may have said:-

"The carpenter stretcheth out his rule; he marketh it out with a line; he fitteth it with planes, and he marketh it out with the compass, and maketh it after the figure of a man, according to the beauty of a man; that it may remain in the house. He heweth him down cedars, and taketh the cypress and the oak, which he strengtheneth for himself among the trees of the forest: he planteth an ash, and the rain doth nourish it. Then shall it be for a man to burn: for he will take thereof, and warm himself; yea, he kindleth it, and baketh bread; yea, he maketh a god, and worshippeth it; he maketh it a graven image, and falleth down thereto."^d

I do not know what furtive creature had assaulted the broken or winkled snails but I blame thrushes. So in ecological parlance the snail is prey and the thrush is predator. Allow that M is the Number of Snails in a closed community and that N is the Number of Thrushes. b is the Birth Rate of Snails and d their Death Rate. r is their Rate of Increase b-d. z is the Death Rate of Thrushes.

The mutual Rates of Change of the coexisting Predator-Prey populations are dynamic and are expressed by the interacting Lotka Equations¹:-

$$\frac{dM}{dt} = rM - kMN$$
$$\frac{dN}{dt} = jMN - zN$$

Do not worry if you do not understand the mathematics of this illustration: I am not *au fait* with simultaneous differential equations myself^e. The point is that these arcane objects are mere intimations of reality, shadows upon the walls of Plato's Cave, symbols with which man models a tree and those who live in its shade. By inspection of the two formulae you can appreciate their complementarity and their chiasmic symmetry, but I doubt you shall be mesmerised by these for the symbolic system, a gross oversimplification derived

from naïve assumptions, will in any case lose further reality in the process of solution.

We wish to track the fortunes of the two contending tribes of Snail and Thrush through time but technically this can only be achieved via a power series expansion of the activity constant k , a process which is necessarily approximate, but whose precision can be chosen *a priori* to yield radically different forecasts.

If you neglect higher order terms in your expansion the two populations wrestle in (M,N) space to oscillate through infinitely-repeated ellipsoidal cycles of complementary boom and bust as they chase each other round a very strange attractor. Take a few more power series terms into play and the forecast is very different: The two tribes spiral through damped cycles to an equilibrium point in which the numbers of Snails and Thrushes maintain a fixed ratio.

Three hundred years ago men fancied the cool measures of mathematics reflected The Plan of God for His Eternal Creation, and their conceit intensified until the days of Hilbert. By the time that Volterra and Lotka wrote in 1925, the foundering of the Titanic and the bloody morass of The Great War had shaken the belief of men in their ability to descry the Purposes of the Deity or indeed in His very Existence. And yet the feeling lingered that He should not be tempted.

And what elegance and what symmetry and what order can mirror the pain the blood and the fear of Predator and Prey locked into timeless cycles of death and contention?

Perhaps our obscure Iron Age advisor feels that he has another Message to relay:-

"For my thoughts are not your thoughts, neither are your ways my ways, saith the LORD. For as the heavens are higher than the earth, so are my ways higher than your ways, and my thoughts than your thoughts."^f

Notes

- a Isaiah 40:6
- b *Betula Pendula*: an aspen-like European tree which colonises waste land and well-drained upland moors
- c a massively-bedded, frequently plumbiferous marine limestone of the Lower Carboniferous
- d Isaiah 44:13,15
- e The Lotka Equations were originally configured for the mathematically-identical instance of entomological parasitism. They are a simplified specialisation of The Volterra Equations (due to Vito Volterra) which are differential equations of

the Verhulstian growth logistic. The Volterra Equations are
meant to describe general interspecific competition.
f Isaiah 55:8,9

References

- 1 "Elements of Physical Biology"
Alfred J Lotka
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