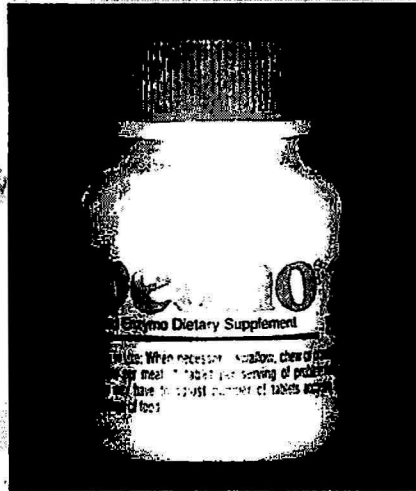
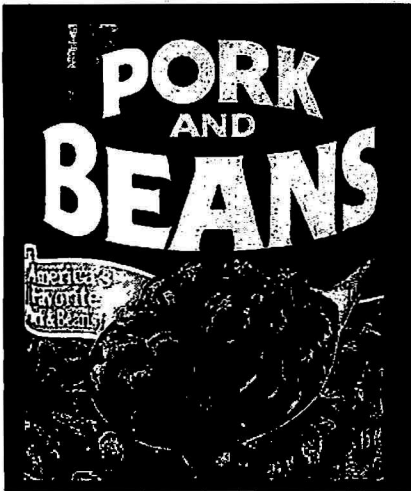


ARCHITECTURAL DESIGN

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Beans, Beans, Glorious Beans



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Ben Nicholson is a truly visionary architect. He is unaffected by fashion, political correctness and sophism. Over the last decade and a half he has sought to reveal, to an amnesiac architectural profession, the numerical structure of human and architectural knowledge. Here he discusses Pythagoras, beans and the geometry of the anus, demonstrating the resonant reflexivity of numbers as illustrated by a master.

Generations of men and women have been drilled with the schoolhouse mantra 'The square of the hypotenuse equals the sum of the squares of the other two sides', sung in a lilting chant that belies the fact that few have the foggiest idea of what it means. The vision of a genial Mr Pythagoras sitting on a stone in the agora, handing out boiled sweets to a mist of eager children at his knee whilst they are busy drawing lines on slates, is wishful thinking. Mr Pythagoras had things other than a career clothed in tweed jackets and stumps of chalk on his mind.

Pythagoras was a power and a mystic: he headed up an esoteric sect which held on to a way of life, and a body of knowledge, that threatened or allied the leaders of the time.

So closely guarded was the inner core of this knowledge that it could not be written down for fear of revelation. Iamblichus relates a story¹ of how a group of Pythagoreans were being hunted down in the countryside, and chose to die rather than run into a field of beans. Just before the last survivor, Timycha, was to be tortured in order to pry out of her why beans were so important to Pythagoras, she chose to bite out her tongue and spit it at the tyrant Dionysius so that she would not divulge the secret of beans. Pythagoreans maintained a formidable nondisclosure agreement.

Inevitably, stories leaked and a series of anecdotal tell-alls passed through the quills of Aristotle, Theophrastus, Plutarch, Iamblichus,² and many others. Included in these writings are quantities of proclamations about beans which have elicited commentary from every sort of bona fide and hack scholar imaginable. Typing PYTHAGORAS+BEANS into the Google search engine releases a flood of academically inclined and nonspecific sites.³ But Timycha's tongue-biting seems to have done the trick, for the facts are wobbly. Since then, historians have felt the discomfort of unprovable hearsay on the subject of Pythagoras, whose only anchor is the ethereal quality of number, a matter well outside the boundaries of verifiable historiography.

Passages about beans in the classics are curious. Iamblichus remarks that Pythagoras forbade his circle from eating beans, 'due to many causes, physical, psychic and sacred'.⁴ Diogenes Laertius is more specific, declaring, 'His disciples were forbidden to eat beans because they are flatulent, they greatly partake of animal properties, and besides, the stomach is kept in much better order by avoiding them'.⁵ Aristotle had weighed in on the subject with

greater candour; Diogenes Laertius goes on to record: 'In his lost treatise *On the Pythagoreans*, Aristotle says the Pythagorean's reason for demanding abstention from beans on the part of his disciples was that they resemble genitals, or because they are like the Gates of Hell.'⁶ Theophrastus is more concise, stating:

Zaratas forbade men to eat beans because he said that at the beginning and composition of all things when the earth was still a whole, the bean arose. And he says that the proof of this is that if one chews a bean to a pulp and exposes it to the sun for a certain time, it gives off the odor of human seed.⁷

At the present time, stories surrounding beans are largely scatological: on the American dining table can be found Beano, which is sprinkled on food to prevent post-pork 'n' beans flatulence, but there is little interest in dealing with the fact that beans are sacred, look like genitals and smell like sperm when they are chewed up. These are issues beyond the reaches of capitalism, hovering at the edges of censorship.

Taking a Peek into a Bean

These remarks from classical authorities remain largely out of bounds because they are scatological, pornographic and have overtones of religion, a deadly mixture for the latter-day scholar. But the opaque remarks are so intriguing that it is worth taking each phrase at face value and closely examining a bean in its light: if a bean is described as having genitalia, ok — then let's look for that. A close inspection of a bean is best done with a magnifying lens. Artificial forms of magnification were known in antiquity: the simplest system can be set up by coaxing a tear to puddle upon your iris whilst your head is bent down peering at something. The eye becomes a very effective magnifying lens with a focal length of about 1 inch, and is as good as a photographer's loupe.

After reading the classics, looking at a magnified bean is a startling sight, verging on the unprintable. The underside of *Phaseolus multiflorus*, aptly known as the scarlet runner, has four dominant aspects. In the middle is a wide opening (hilum) surrounded by a rounded, glistening, ruddy pink rim. At its bottom are two tiny gonads (raphe) pressed tight against the opening. Above the opening is a pinprick hole (micropyle), and beyond that is a big bulge beneath the bean's jacket. Aristotle's remarks about the bean's likeness to genitals is confirmed: the bean comes with its own penis, urethritic-pee hole, vulva and a pair of testicles, perfectly crafted into a hermaphroditic whole.

When the bean is stripped of its skin (testa), the genitalic form intensifies. A resemblance of a little penis (radicle) is found beneath the bulge of the shell, complete with a wimpy little tip. To the left and right of it are protrusions and, at its top, is a flap, attached to one of the buttock-like cotyledons, which works its

Opposite left and middle
Berk: 'n' beans and beano; the
opposite right: the
opposite left: the
opposite right: the

Opposite right
Opposite left: the
Opposite right: the

Photography of beans by
Alice Hargrave.



way across to the other cotyledon like trouser flies. With the testa stripped away, the vulvate opening is gone too, replaced with the sinuous curve of an opening. Colour has been drawn out of the bean; it has an ivory whiteness, marked by form and light alone.

When placed in a bowl of water and left to its own devices, the hard skin (testa) of the bean begins to soften as a result of fluid passing inwards through the tiny hole (micropyle), and the membrum (radicle) within begins to stir. So powerful is the arousal to life that the skin tightens until it splits open with a powerful rip that makes a horizontal gash, a self-made episiotomy, generated by the call to life. With time, the little root begins to fill itself out and stir, getting bigger and longer each day, until it makes its way out of the torn skin. The two cotyledons of the bean cleave apart, unwieldy buttocks beckoning inward, yet this first conception has happened without coition. The unruly membrum never entered the cavity; it went off on its own route to the centre of the earth, down towards Tartarus, through the gates of hell, no doubt to be met by Pneuma Akathartos, the evil spirit of foul winds. The devil is in the details.

Returning to science for a minute, the membrum is of course no more than a radicle attached at its hilt to the cotyledons of the bean. The root runs downwards into the earth in order

to get enough purchase to push the plumule, a pair of perfectly formed embryonic leaves, into the light so that they can get life-giving sustenance from the sun. The radicle and plumule gradually draw the nourishment needed out of the cotyledons until these are sucked dry of energy and eventually drop off the stalk. Thus the bean stalk moves in two directions: to moist earth, via the hypocotyl, and the warm light, via the epicotyl. The bean has no arms, legs, trunk or head, it is all genitals; the bean *is* creation, as Aristotle was supposed to have remarked, one end of it going to hell and the other up to heaven.

The Big O

The nature of the orgasm, that pocket-sized metaphor for the astronomer's big bang, still intrigues humankind as much as it ever did. At the macro level, we constantly hunt for the singular moment of life's beginning.⁸ Adjacent to the entries on beans, farting, sex and religion in the writings on Pythagoras are passages about the quality of number. This is not a coincidental juxtaposition, for the essence of number is at the essence of generation. The proofs of Euclid and the cryptic language of contemporary mathematics make it difficult to access the beauty of number; however, the bean offers up a very accessible perspective when it is observed directly.

If a single bean is stuck into warm moist earth the tiny desiccated root and leaves spring into life, pushing apart its two halves; from one bean comes two parts, and with the passing of the season (and all the tricky

Left
Bean physiognomy: a hermaphroditic monadic lump composed only of a vagina, an on/off penis, a urethra, a scrotum and a pair of buttocks.

Right
When looked at through a tear the origins of life are visible in the desiccated root and embryonic leaves inside a bean.

Opposite
Pods of from one to seven beans spawned from a single monadic scarlet runner bean.

circumstance of the plant's life) the vine becomes covered in pods, each of which is filled with a fixed number of beans. A pod can hold one bean, two, three, four, five, six or seven beans; in Chicago, the scarlet runner is reluctant to produce more than seven to a pod. That one bean can generate a fixed number of pods with one, two, three, four, five, six or seven beans in each pod cannot fail to have been noticed by Pythagoras. The hermaphrodite bean, all genitals and no head, has completed a measured cycle; it has spawned from a single bean sequences of fixed numbers, lending credibility to the act of creation through a quantifiable materiality. Number asserts creation.

A gardener and a philosopher look at beans quite differently. The gardener opts for a balance of circumstance that will optimise the quality and quantity of beans, whilst the philosopher inquires into the nature of the bean and where it is situated in the larger scheme of things.⁹ For the philosopher,² if a bean begins as one and ends as many, it would seem logical that latent within the bean are other numbers. How then is it possible to get at them?

A Philosopher Stalks the Beans

After laying a pile of beans on a table and inspecting them, one notices how very different they are from each other: they can be big/small, fat/thin, lumpy/smooth, speckled/plain, tapered/bulbous, ugly/beautiful; the more they are inspected the more differences they seem to hold. If beans are laid out top to tail in a long line, the big and the small average themselves out to suggest a mean length; despite their differences they have achieved a standardised unit. The bean retains its individualistic singularity and difference, yet when put together beans become a quantifiable and measurable length. As a device for counting and measuring, a bean is more animated than a pebble; beans create numbers, pebbles confirm them.

A single bean is now selected to discover its quality. If it is stared at, poked at and wondered at, curiosity will inevitably lead to its being cut open. The bean naturally cleaves into two halves; what was once one whole is now two. This action shows that two is latent in one. To extend this logic from the physical to the conceptual, if one became two, two could become four, and four could become eight. If the bean's physique naturally leads from one to two, is there any reason why the same principle of doubling cannot be extended conceptually, and the bean become three? If a bean could become two, then

surely it can become three! And, if a bean can become three, it follows that three could be tripled to become nine and, in turn, nine could become 27.

If beans are laid out as two limbs, according to the two generative acts described above, there comes the desire to do to the pile of three beans what was done to the single bean: to double it to make six beans, and to double that to make 12. It becomes apparent that six is also the sum of two beans that have been tripled; the qualities that emerged out of a single bean are now confirming themselves, forming a new kind of whole.

Geometry Joins the Arithmetic Fray

If the little piles of beans are joined with lines, a simple triangular grid forms which can be overlaid with lines which project further associations. New qualities emerge: if the pile of two beans is added to the pile of three beans they add up to five beans. If the adjacent numbers are added on the lines parallel to it below ($6 + 9 = 15$ and $18 + 27 = 45$) it will be seen that all adjacent numbers situated on lines parallel to the line formed by $2 + 3$ are factored by 5 ($15 = 3 \times 5$, $45 = 9 \times 5$).

If these two piles of beans joined by a line are associated with the number five, then other piles of beans may have similar qualities: on the next page, the figure on the left shows that every pair of adjacent numbers situated on a line composes a prime number or is factored by a prime number. In a triangular structure, whose limbs are formed by 1, 2, 4, 8 and 1, 3, 9, 27, the factors of adjacent numbers can compose the primes 2, 3, 5, 7, 11, 13, 17, 19 and 29. Only 23 is absent, but will re-emerge if the grid is extended. Thus, within one bean, the monad, a universe of numbers emerges, primes and all.

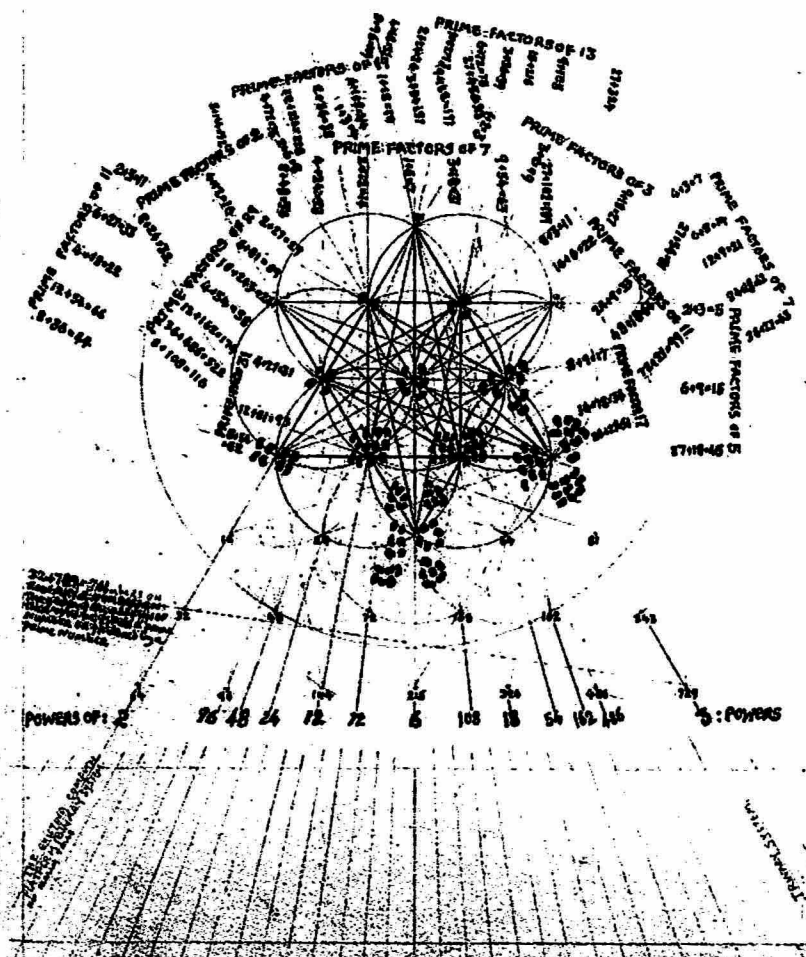
This triangular grid of numbers, generated from the monad bean, has another quality which demonstrates the measure of infinity. If the grid is generated outwards and a line is drawn in space, that line will be parallel to one that passes through two points on the extended grid; it will snag a prime or be factored by a prime. Thus, any straight line drawn at any angle on a two-dimensional grid is identified with a prime number; thus the concept of random direction is inextricably linked to the prime number.

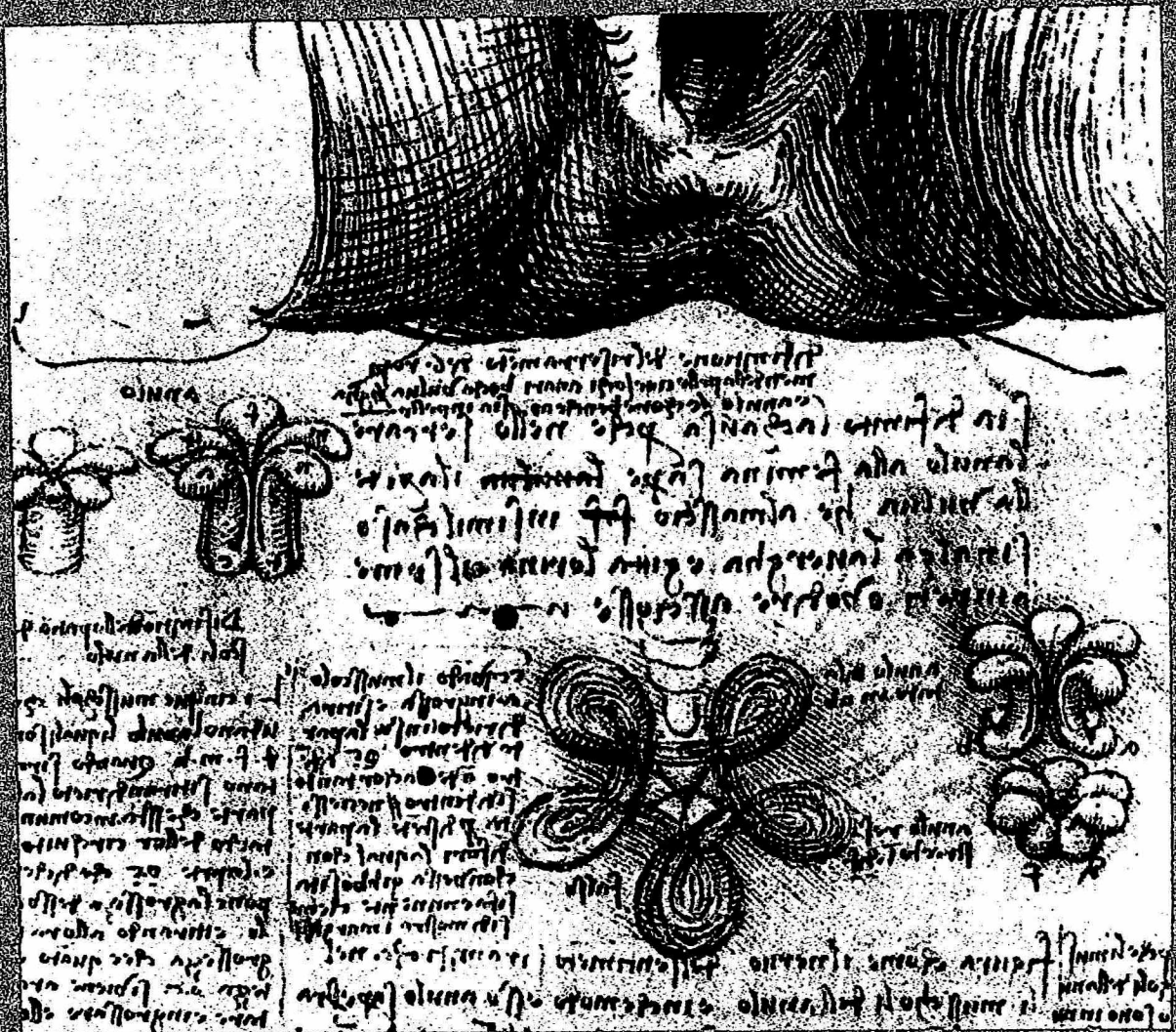
The dicot bean has spun a perfect yarn about itself, with qualities of coincidence that are as immaculate as the concept of creation. Number is the match for the pair of desiccated leaves and root nestled between the flanks of the bean, but the majesty of number and growth still remains outside human comprehension.

Beans, Bottoms, Measure and the Golden Mean

It is easy to be lulled by the narcotic logic of number when regarding the generative properties of beans, but why was so much ink spilled by the ancients on the subject of flatulence? The Pythagoreans are reputed

Opposite
The curious protective coat
of a *Phaeseolus multiflorus*
(scarlet runner bean) encloses
a pair of cotyledons within.





it up fearful that it might be taken away from them? And what is measure within void? Architecture is ready to make a place that is beyond measure and materiality, where anthropocentricity gets stacked on top and for a while, severing the corporeal shackles.

A Natural Reflex

There is something especially pleasurable about engaging in a historical inquiry as a subject for which all prime documents are missing, and which is composed of second-hand hearsay. It confronts the iffy status of architectural paranoiacs living in an underworld of poorly constructed arguments, without either proof or truth, yet with a certain poetry that eludes the Dictators. Perhaps these sorts of inquiries, and the spaces that they invoke, are the new frontier of debate: a dangerously loose kind of terrain in which the story is better than the facts that become walled around it. By not looking for what is deemed to be defunct, or what is supposedly

new, consider a realm in which all exists, waiting to be found, without provability, a storyland beyond history.

Pythagoras' beans certainly conjure up such a terrain. In this aftermath, later or quasi-history, the question still remains: why were Pythagoreans forbidden to eat beans? To eat a plate of beans that look like, general like, small like and then act out every aspect of nature: number, scatology and sexuality, which only dinnily had any hope of pulling back into singularity, would not be especially conducive to a happy appetite. Would you want to eat beans after this much conjecture about them? But, seen in this light, beans do have an especially satisfying capacity to bring together the more primal qualities of the body and the more tricky aspect of the intellect. Perhaps they are the mean between that which desires order and that which gives it war, comes, grunts and all. The beauty of the bean is that it has qualities of measure and chaos, the one thriving upon the other's inadequacy. Measure is never single, it is coupled with the anecdotal, the implied spaces of things that are outside of comprehension are given form. *Don't appear to*