

The Periodic Table of Ayurvedic Elements

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SLIDE 1

This presentation is a summarized expression of my forthcoming doctoral thesis, entitled “The Periodic Table of Ayurvedic Elements.”

This project originated in 2017. I was in my third year studying with Alakananda Ma at Alandi Ashram in Boulder, Colorado.

We were studying aspects of modern biomedicine alongside Ayurveda, and constantly asking how best to integrate these uniquely powerful, distinct-yet-complementary ways of knowing.

The observation and subsequent question that arose in me at that time was essentially this:

- Ayurveda operates on the premise that all of creation is composed of a dynamic conglomeration of the five great elements
- modern science (and thus biomedicine) operates on the premise that all of creation is composed of a dynamic conglomeration of elements, first organized into the Periodic Table by Dmitri Mendeleev in 1869.
(<https://www.asbmb.org/asbmb-today/science/020721/a-brief-history-of-the-periodic-table>)
- If both ways of knowing agree that all of creation is composed of “elements,” there must be a way to translate between these two stories of creation
- And if there were a Rosetta Stone that could serve as a translation key, what would that even look like? What could it be?

This question has become something of an obsession, and today I intend to tell you as much as possible about what I’ve discovered in the quest for a satisfactory answer — although, like drops of blood from the buffalo-demon, every satisfactory answer only gives rise to a thousand and eight better questions, but that’s as it should be.

So, please join me on this journey in which I hope to show how the archetypal geometric structures known as the Platonic Solids provide a common reference point for elements Ayurvedic and Periodic.

With the Platonic Solids as our Rosetta Stone, we can find common ground as we trace the arc of these two disparate creation stories.

- We begin with a refreshed version of the modern, biomedical creation story, building up from black wholes all the way to human biology.

- We'll then trace the arc of spirit evolving into form as described by Sankhya philosophy, the basis for the Ayurvedic concept of the body and all of perceivable reality.
- At the end of these stories, a mere 50 minutes from now, we should be ready to assign Ayurvedic qualities to Periodic Elements — you know, if we have time...

One thing I want to say right away is that this project includes a complex blend of hard science, abstract thought and spiritual speculation.

I am in no way being considered for a degree in physics, math or chemistry. This is, at its core, a spiritual quest.

That being the case, I will do my best to distinguish between proven facts, appealing theories and magical thinking. Each have their place in the process, so I only hope to accurately cite sources and contribute to a conversation that has been ongoing for many, many generations.

I would also like to acknowledge that throughout this presentation I will be referencing a litany of dead white men.

As a temporarily alive white man myself, I am conscious of the fact that Ayurveda is a form of indigenous medicine passed down through the generations — primarily by women in the domestic sphere. Grandma's home remedies, and all that...

I feel quite humbled by this truth, and aspire to step delicately as I express my enthusiasm for this precious wisdom.

Lastly, please forgive me for zipping through. There is so much I want to tell you, and our time here is fleeting. I will share my slides and written script afterwards to accompany the recording so you can always go back and review.

Okay, all that said, our 21st century creation story begins with a Nobel Prize winning experiment.

SLIDE 2

The 2017 Nobel Prize in Physics was awarded to a team from Cal Tech for a project called LIGO which stands for Laser Interferometer Gravitational-wave Observatory.

In September 2015, LIGO made the first-ever direct observation of gravitational waves—ripples in the fabric of space and time predicted by Albert Einstein back in 1916.

<https://www.ligo.caltech.edu/page/press-release-2017-nobel-prize>

Ripples in the fabric of space-time? That's very interesting because, well — what is “the fabric of space-time” other than ether, the akash?

Each of the twin LIGO observatories—one in Hanford, Washington, and the other in Livingston, Louisiana—picked up the feeble signal of gravitational waves generated 1.3 billion years ago when two black holes spiraled together and collided.

Here is an artist's rendering of what this looks like:

SLIDE 3

To summarize so far —
the latest laser technology
precisely arranged across vast physical distances to create the most sensitive ever detector of
subtle perturbations in the gravitational field
was able to measure the ripples in that field
that are radiating out from the collision of two neutron stars aka black holes
1.3 billion years ago,
and this is approximately what it looks like.

What does this look like to you?

To me, it looks like a still pond into which a large stone has been plunked.
Are not these the same waves we see flowing through water?
Except in this case the medium is not water but gravity itself.

If we can agree to speculate that the field of gravity, the very fabric of space-time is equivalent to Ayurvedic concept of akash, then it is an unavoidable next step to view these as sound waves, since akash expresses itself through the power of sound.

SLIDE 4

A brief aside here — Just in case anyone ever tries to tell you that Einstein denied the idea of Ether, that is not true. There was a moment in time when he didn't think the Ether existed, but by the end of his life he had come back around and was working on equations to solve for it. This quotation demonstrates his recognition of the absolute necessity of Ether.

The next link in the chain is Cymatics —

SLIDE 5

Cymatics shows the fundamental power of sound to shape and transform seemingly solid objects.

Let's watch a quick video clip to see Cymatics in action: <https://youtu.be/wvJAgrUBF4w>

This is sand being poured on a chladni plate connected to a frequency generator. As the plate starts to vibrate, the sand bounces around "randomly," but when we reach a particularly harmonic frequency, suddenly, the sand spontaneously self-organizes into predictable geometric shapes.

As the frequency increases again, leaving that harmonic node, chaos ensues, until we reach the next harmonic tone and the sand snaps into place, forming a different set of shapes.

Pretty cool, right? The original experiments were performed in the 1970's by a guy named Hans Jenny. He used all sorts of substances, including oils and liquid metal to demonstrate the principles and possibilities of Cymatics.

Video of these experiments are on YouTube and worth watching.

Okay so —

two incomprehensibly potent forces spiral and collide, setting the whole ocean of space-time rippling out with gravitational or etheric sound waves; and we know that harmonic sound waves generate stable, predictable geometric shapes.

In that case, we should expect to see coherent geometries expressed at every layer of creation. Sure enough, that is exactly what we find.

In the year 1619, Johannes Kepler publishes *Harmoniae Mundi*, a seminal work in which he summarizes astronomical data showing that planetary orbits can be accurately modeled and predicted according to archetypal geometric structures.

SLIDE 6

Here is a visual representation of how this works.

Now, the first thing to say is that Kepler was ultimately frustrated by how tantalizingly close and yet unsatisfactorily far from reality was his theory.

What he was unable to account for in his lifetime is that planetary orbits are not circular, they are oblong, ovals. Kepler's theory is elegantly accurate only if you measure the mean orbit, which is to abstractly make circular what is actually oblong.

Here we see the relative mean orbit of Mercury precisely defined by a process of inscribing circles to create a triangle within the mean orbit of Venus.

Then we have the relative mean orbit of Earth defined by a process of inscribing two six-pointed stars within the mean orbit of Jupiter.

SLIDE 7

Here's some more of the same information in text form. Again, this theory is not perfect; not everything in the solar system fits neatly; it's a bit messy.

But I find it compelling in its close-enoughness. I believe that it is messiness that drives creation forward — life does not go in circles, it spirals out, and to spiral requires deviation from the plane of a plain old circle.

SLIDE 8

(skipped over during presentation)

SLIDE 9

Kepler's theory leads us to this man, Dr Robert J Moon, who is also, as you can see, a proponent of the existence of a physical Ether.

Moon taught Physical Chemistry at the U of Chicago and was one of the key players in the Manhattan Project during WW2. Later in his life he quite naturally regretted his participation in what turned out to be a horrendously destructive enterprise, and he turned his attention to life-giving pursuits.

In the attempt to create a viable model for the structure of the atomic nucleus, Moon was inspired by Kepler's concept of the cosmos. He wondered if atomic structures might also be organized according to predictable geometries.

What is now known as the Moon Model proposes a symmetrical arrangement of charges (protons) on a sphere, surrounded by a set of nested shells and orbitals (electrons) beyond the nucleus.

"In Moon's 'Keplerian atom,' the 92 protons of the naturally occurring elements are determined by the vertices of two identical pairs of nested [Platonic] solids, each containing 46 vertices."

Let's unpack what exactly that means:

SLIDE 10

Okay so this is an image from Kepler. An attempt to represent the solar system according to his system of nested spheres.

The circular orbits we saw earlier were 2 dimensional representations. Of course, space is three dimensional, therefore circles are spheres, squares are cubes and triangles are tetrahedra or octahedra or icosahedra, and so on.

SLIDE 11

Now let us study these images of Moon's "Keplerian Atom." The similarity is obvious. We see again the platonic solids nested sequentially within each other. This is how Moon proposes the nucleus is constructed — with protons located on the corners of these geometric shapes, expanding in concentric spheres as the atomic numbers rise.

But what are we really looking at here?

SLIDE 12

On the left there we see that: "The first shell proposed by Moon is a cube, which reflects the distribution of the eight protons in the nucleus of Oxygen."

“The next shell would form after adding six new protons, reflecting the distribution of the fourteen protons in the nucleus of Silicon.” With six new protons, we now have an octahedron with the cube inside it, seen there on the right if you look carefully.

The layers keep building like this, filling out the next sequential shell until every vertex is full and its capacity to contain protons is complete, so the next proton starts a new layer, a new geometric shape.

When we get to 46 protons (Palladium), the next proton initiates the start of a new shell altogether, building again until we have a bonded pair of 46 protons, for 92 altogether, which makes Uranium, the last of the naturally occurring elements.

Using the five platonic solids inscribed within nested spheres, we can create every single naturally occurring element.

SLIDE 13

Here’s a visual representation of the pairing process between two dodecahedra

The varying levels of stability shown by these geometric structures indicates the varying stability of the elements.

Here we see, for example, that the twin dodecahedra create Radon (86) when joined at a face. To create Uranium, that joint must open up to connect at just an edge. This is a far more tenuous connection, and Uranium is observably more unstable than Radon.

To build 91 Proactinium, we are down to just one point of connection and indeed, this element is highly reactive with oxygen, water vapor and inorganic acids.

We will come back to the relevant qualities of specific elements a bit later.

For now, let’s remember that
if the structure of space-time itself is in a perpetual state of vibration,
and vibration generates geometry,
then it would make perfect sense
for the fundamental building blocks of creation to be geometric in nature.

And, if the atomic building blocks are composed of these essential solids,
and everything large is made of something small,
then it would be reasonable to expect to find
similar geometric structures encoded in human bodies,
which are, on the cosmic scale,
just medium-sized conglomerations of these atomic building blocks.

Sure enough, platonic solids are essential to human anatomy and physiology as shown by something called Biotensegrity, which is the biological application of Tensegrity.

SLIDE 14

Tensegrity is a portmanteau of the words Tension and Integrity. Its core concepts were developed by Buckminster Fuller and applied architecturally by Kenneth Snelson.

Here are a few famous examples: Bucky's geodesic dome, known as the Biosphere from the Montreal Expo in 1967; and a sculpture which by all appearances should be impossible within the laws of gravity.

The key concept is that there are islands of compression within a sea of tension. In the sculpture shown, none of the struts (islands of compression) touch each other; instead, they are held together by the sea of tension generated by the connective wiring.

I have my tensegrity toy here...

There is little or no mechanistic compression here, as is customary for architectural structures.

According to Graham Scarr, Tensegrity can be defined as:

“a balance of forces that reach a stable but dynamic equilibrium. It manifests when a continuous web of attractive forces (pulling in) is counter-balanced by several non-continuous, repulsive forces (pushing out). This balance results in a system with maximum efficiency of spatial organization and energy expenditure. These forces can be non-visible such as gravity or visible such as wooden sticks and rubber bands. Tensegrity can manifest in anything from the smallest atoms attracting and repelling each other, to planets, stars and solar systems. Many systems in nature will naturally organize this way due to its high efficiency, minimal resource requirements and resilience to external forces.”

SLIDE 15

The human body is a natural system that operates with high efficiency, minimal resource requirements and relatively excellent resilience to external forces — so why not Biotensegrity?

In the human body, the fascial web, composed of collagen and elastin fibers, organizes and holds every cell in place, defining its mechanical environment and spatial relationship to its neighbors.

Thus the fascial web is an intricate, three-dimensional web of tension organizing around strong bones that resist compression. The skeletal system is organized, balanced, and suspended within the fascial web — a sea of tension containing islands of compression.

This is the concept upon which the practice of Structural Integration, ROLFing is based.

Donald E. Ingber MD PhD, Professor of Pathology at the Harvard Medical School, has published cellular research finding conclusive evidence that tensegrity provides the best explanation for the cytoskeleton of the cell, its movement and behavior.

For example, when the web of tension gets tight, the cell responds by adjusting its shape. Form determines function, and eventually the structure of a squeezed cell will initiate instructions for apoptosis.

On the other hand, if the tension is too loose and the environment is too spacious, the cell spreads out, a form which eventually stimulates instructions to expand and initiate cellular division.

Most notably, for our purposes, is the fact that tensegrity structures are unerringly composed of one or another of the Platonic Solids, with special favor for the tetrahedron, octahedron and icosahedron, as the cube and dodecahedron are not stable without triangular bracing.

This concludes our 21st century creation story, in which we've seen how colliding black holes generate a cymatic wave throughout the space-time sea of gravitational tension, waves which organize the islands of compression that are planets, protons and bones into efficient, resilient geometric structures.

Now, let's take a deep breath, maybe a sip of tea, to let all that sink in before we pivot to what I expect will be slightly more familiar territory for many of us.

SLIDE 16

Who recognizes this image?

Thanks to Dr Lad for his classic Sankhya diagram from the yellow textbook. I remember reading that textbook for the first time, learning about how sankhya describes the process by which spirit becomes matter and feeling a sense of confirmation that yes, I will study Ayurveda for the rest of my life.

My apologies to anyone for whom these words and concepts are not familiar, but a detailed examination of each aspect of Sankhya is not within the scope of this presentation.

This chart will be the basis of our Vedic creation story — our map through the territory of stuff from subtle to dense.

First, we must note that classical Sankhya is an explicitly dualistic philosophy.

According to the Sankhyakarika of Isvarakrishna — Purusha, that pure consciousness is yet in need of liberation from the cycle of birth and death in order to attain ultimate enlightenment or unification with the Source of All That Is.

Prakriti — described by Gerald Larsen (p12) as “unconscious being,” or “an undifferentiated plenitude of being which implicitly contains the possibilities of all thought and substance” — is made consciously intelligible by its proximity to Purusha.

So goes a well-known Sankhya simile — Purusha and Prariti work together the way one who cannot see and one who cannot walk may be of mutual benefit.

From the interaction of Purusha and Prakriti — here roughly categorized as the Stuff of Spirit — unfolds all subsequent creation.

On the subtle psychological level, we have the various incarnations of the Stuff of Mind in the form of Mahad, Buddhi and Ahamkara;

Simultaneously, in the realm of Stuff of the Senses, we get the three gunas, the innate attributes we experience as Sattva, Rajas and Tamas.

These combine to create the next dimension of density in the form of the five elements, Ether Air Fire Water Earth which, when combined, allow for the manifestation of the three doshas we know so well within our bodies and in the perceptible, describable world around us.

This ancient creation story provides yoga, Ayurveda and Jyotish with its concept physical existence. Its principles are well-established. It is worthy of lifetimes worth of study and contemplation.

So, moving on, I would like to retell the Sankhya story using simple geometric concept

SLIDE 17

Now, this is where the presentation gets a little racy, so if any children are present, close your ears and hide your eyes. I've titled this slide Geometric Evolution, but that's the PG version. The real title is Geometric Sex, because that's how evolution happens, is down through the generations and generations are generated by intercourse.

Okay, ready?

Here we have the monad, the one without a second, Dimension Zero.

CLICK

An abstract point in space. This dot has a circle around it to indicate that we can zoom infinitely in or endlessly out and that dot will always recede or expand to match. There is nowhere to go but in or out and it's all dot. I'm fond of this dot. Let's name it Purusha, just because we can.

Now, this dot may be all-encompassing, but that fact also makes it a bit boring — there's not a lot happening here. If we want something (anything!) to happen, we need to move in a different direction —towards a second dot, perhaps.

CLICK

Just for fun, let's name this dot Prakriti. Now, fair warning, this is where it gets a bit racy...

CLICK

Oh my, I hope that was okay for everyone. Of course, isn't that what inevitably always happens when two dots come into close proximity? Isn't that what always happens when two black holes get pulled into one another's orbit? A merging is the only possible outcome.

And what results from this merging? A new dimension. In this case, we have a line marking the distance between the respective centers of our beloved dots.

CLICK

A line represents Dimension One, directionality. Creation now has a vector; it has a new plane upon which to move. No more of that eternal in and out, we can now move "to the side." Very exciting.

Together, Purusha and Prakriti establish Dimension One. But their merging produces offspring in the form of two newly defined points in space, where the edge of their respective circles meet.

CLICK CLICK CLICK

Now we have four points to play with. Connecting them, we get five lines.

CLICK CLICK CLICK CLICK

Something very special has just happened. By connecting the dots, we have given birth to Dimension Two, which is defined by the enclosure of area.

CLICK

Dimension Two is defined by the triangle and the rule of threes. As we learn from Schoolhouse Rock, three is the magic number. A man and a woman have a little baby, that makes three in the family.

Cartoons happen in two dimensions; novels are written on flat sheets of paper — any good story requires a variety of triads:

- a beginning, middle and end;
- a hero, nemesis and narrator;
- a status quo, a trial and a return;

Three is the number of drama — the perpetrator, victim and rescuer. Three is the catalytic number, accelerating the chain reaction that is creation.

CLICK CLICK

So here we have our two triangles, indicative of dimension two. We have two triangles because everything arises in paired opposites, right? Can I safely say that to an Ayurvedic crowd?

Where else do we have two pairs of triangles? Oh, that's right, in our Sankhya story — the Mind-Stuff (manas, buddhi and ahamkara) and the Sense-Stuff (sattva, rajas and tamas).

So Purusha and Prakriti are proud parents to Mind and Sense-stuff.

CLICK

Can you guess what's going to happen next? It's Biblical, in a way, when you think about the practicalities of how Adam and Eve began to populate the planet. And, well, it's hard to define, but you'll know it when you see it.

CLICK

Wow. I hope you enjoyed that as much as I did. Do we recognize this shape? That six-pointed Star of David, Seal of Solomon is pervasive throughout creation.

For example, a benzene ring, which is a foundational component of all carbon-based life, a constituent of membranes and source of steroid hormones, is Carbon 6 Hydrogen 6, forming a perfectly hexagonal chemical compound.

Six is also the number of elements, senses and organs of action when you add the organizing force that is the mind.

The six-sided star is one of the most inevitable geometric shapes you can make. If you have nothing but a compass, and you start drawing circles, the first thing you are most likely to draw is a seed of life with 6 circles evenly distributed around a central one, forming a flower with six petals.

Furthermore, connecting all the exterior dots would create a hexagon, which is another way of drawing a cube, which — you guessed it — gives birth to our next dimensional generation.

A cube is one choice, but we're going to make a difference choice with just a few adjustments.

CLICK

If we adjust our merged triangles just so (sorry, I'm really sorry, it's not my fault, nature is just sexy like this) we see a three-dimensional figure coming into view

**CLICK CLICK CLICK CLICK
CLICK CLICK CLICK CLICK**

Boom. Please meet our newborn tetrahedron. Purusha and Prakriti are now grandparents, and we are now solidly in the third dimension as defined by the fact that we are enclosing volume — taking up space!

The descendants of Mind and Sense-stuff are the five Elements, the essential ingredients of the three-dimensional realm we commonly call reality.

And what are they geometrically? Well, we had the option for a Cube, and we went for a Tetrahedron. These are two of the five Platonic solids, the other three of which can be easily extrapolated.

So what are these Platonic Solids anyway? What makes them so special?

SLIDE 19

The Platonic Solids (actually discovered and popularized by Pythagorus) are the only five shapes of their kind — the only five possible convex regular polyhedra.

What's that? Well, a regular polygon is a two-dimensional shape with equal sides and angles — an equilateral triangle or a square, for example.

A regular polyhedron is a three-dimensional shape made exclusively of regular polygons — there are many of these, including Archimedean solids, where squares and triangles combine to form a solid.

But there are only these five convex regular polyhedra which are composed completely of the same regular polygon — the way the cube is all squares, the dodecahedron all pentagons, etc.

It seems to me and Plato himself that it is no coincidence that there are five such solids and five great elements. Indeed, he assigned each solid to an element.

SLIDE 20

There is endless opportunity here for speculation, but I'll offer just some quick observations:

- the tetrahedron, associated with agni, has the sharpest angles
- the icosahedron, associated with Ap, is most spherical
- Vayu, Agni and Ap are all composed of equilateral triangles; these can easily transform in and out of one another while Akash and Prithvi are a bit different and interact less simply.
- encoded in these shapes are a set of opposite pairs

SLIDE 21

Here we see the Platonic Duals —

- the octahedron inscribed within the center of a cube; the cube inscribed within the octahedron
- the icosahedron within the dodec; the dodec within the icosahedron
- and the tetrahedron standing alone as its own dual pair

These dual pairs go a long way in showing why the Moon Model is so effective — these shapes are natural collaborators, overflowing with interwoven connections.

They also point us to some interesting speculations about how the elements interact.

- ether and water are an opposite pair — doesn't this make more sense given what we've seen about they gravitational waves behave?
- air and earth are an opposite pair — mobility and stability as inverse opposites
- fire as its own opposite — the catalyst, transforming whatever it touches while always remaining itself

So this is our Sankhya creation story retold in the language of geometry.

We've come from the subtle, abstract realms of Purusha and Prakriti, down through the filter of the mind and senses and into the realm of embodiment and actual, experiential existence.

Our last task is to put it all together. Let's see what we can see

SLIDE 22

So here we have it, in simplest terms.

- according to Laurence Hecht, the first three elements — Oxygen, Silicon and Iron — correspond to the elements that seem to be of greatest abundance in the solar system.
- super stable Oxygen, associated with the Earth element, composes 62.55% of the Earth's crust; oxygen is also an essential change agent in chemical reactions
- Silicon is the next most abundant, making up 21.22% of the Earth's crust; Silicon is a vital conductor of electrical charge
- Iron makes up only 1.20% of the crust but is the 4th most significant by weight (5%), which is three orders of magnitude greater than the elements near it in the Periodic table; Iron is famous for its capacity to establish and maintain a magnetic field; it is an

important component of hemoglobin, which carries oxygen through the body; and helps plants with chlorophyll production — core functions of life

- Palladium is a uniquely symmetrical element that represents an important boundary condition in nuclear fission.
- All of these elements, including Uranium, tend to fall at or near minimums of measures such as “atomic volume, melting point and so on”

In addition to these four elements, the geometric processes of the Moon Model identify important singularities at 56 (Barium), 64 (Gadolinium), 70 (Ytterbium), 81 (Thallium), 86 (Radon) and 92 (Uranium).

Further research is needed on the significance of these elements. If anyone is or knows a nuclear physicist or biochemist looking for a fun project, please put us in touch.

In all this, you may notice the absence of the tetrahedron.

SLIDE 23

Moon assigns special status to the shape that represents the simplest way to enclose volume, the most efficient close-packing of space possible.

He calls it the “alpha particle... whose vertices first serve as the two protons and two neutrons of a helium nucleus, while for nuclei of atomic number greater than two, [this inner tetrahedron] would serve as the location for neutrons.

The shape that is its own opposite pair serves as the location for neutrons. Something elegant about that, yes?

So that’s the story.

SLIDE 24

Q&A