Solomon's Molten Sea: A Three-Dimensional Periodic Table of the Elements?

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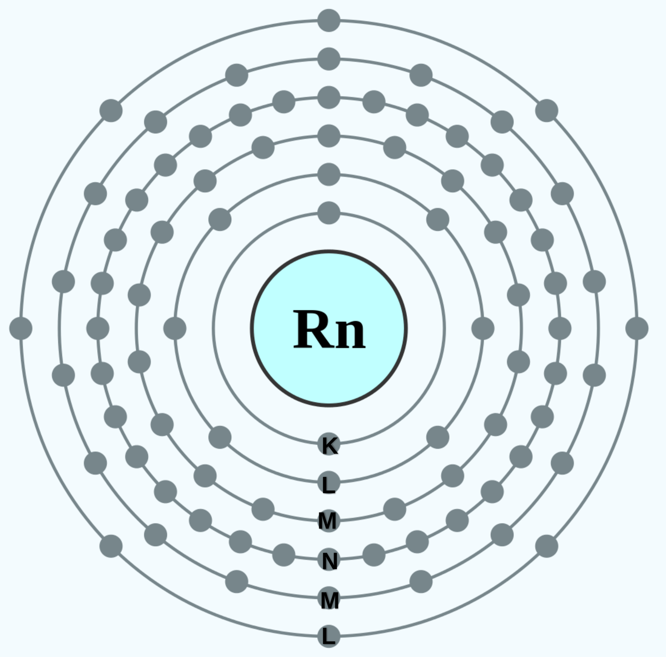
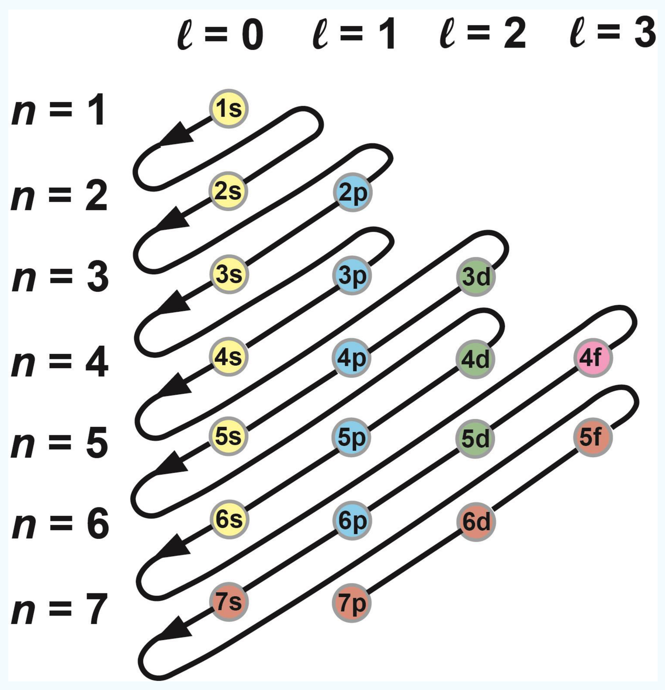
Abstract

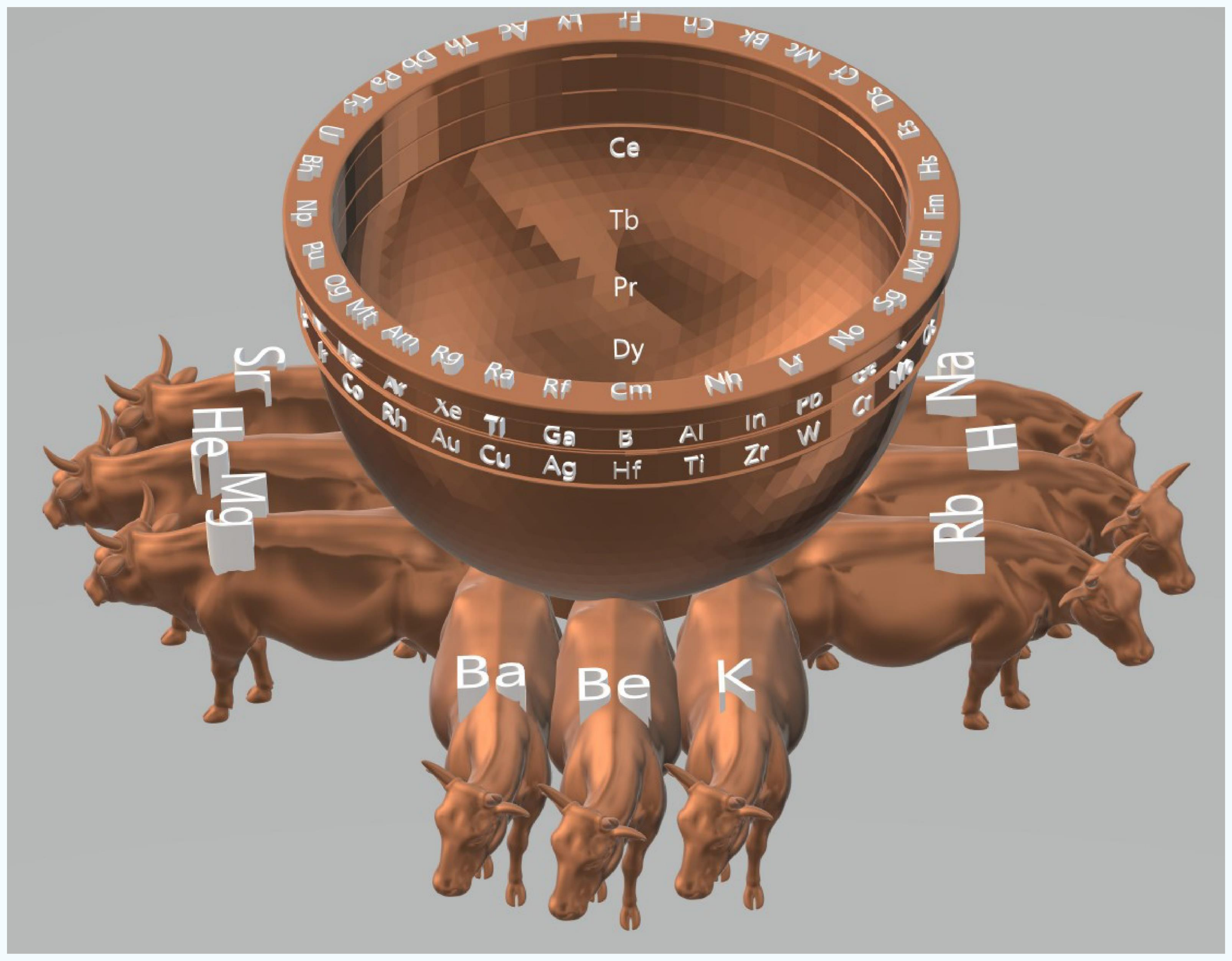
The account of Solomon's Molten Sea (MS) in 1 Kings 7:23-26 and 2 Chronicles 4:2-5 describe a circular metal vessel measuring ten cubits wide by five cubits tall situated on the hind quarters of 12 metal oxen. Underneath the brim were two rows of knops cast, forming two rings of thirty cubits circumference each. A further investigation of the Molten Sea's features and dimensions found that this ancient object possesses a shocking similarity to the Periodic Table of the Elements (PTOE). I discovered that each of the Sea's five main elements, i.e., the twelve oxen, the two 30-cubit rows of knops, the 14-cubit lower bowl circumference beneath the knops, and the 31.4-cubit circumference brim may be a three-dimensional representation of the shell model of electronic orbitals, as well as the Periodic Table of the Elements. This poster illustrates how the 2, 8, 18, 32 electron shells and s, p, d, f sub-orbitals are plainly developed from the oxen, upper ring, lower ring and bowl portion respectively. Other features of the model, such as periods, groups, *n, ℓ, m, s* quantum numbers, Aufbau Principle, and Hund's Rule are discussed.

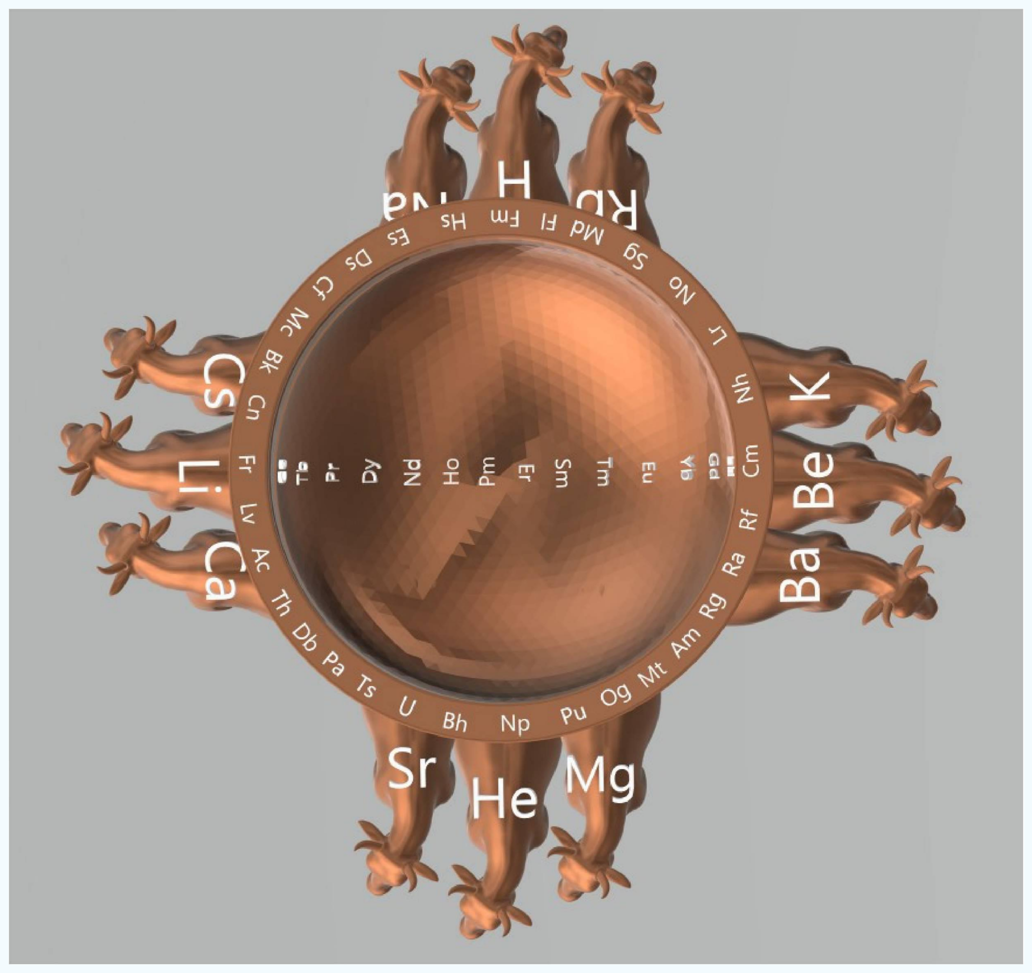


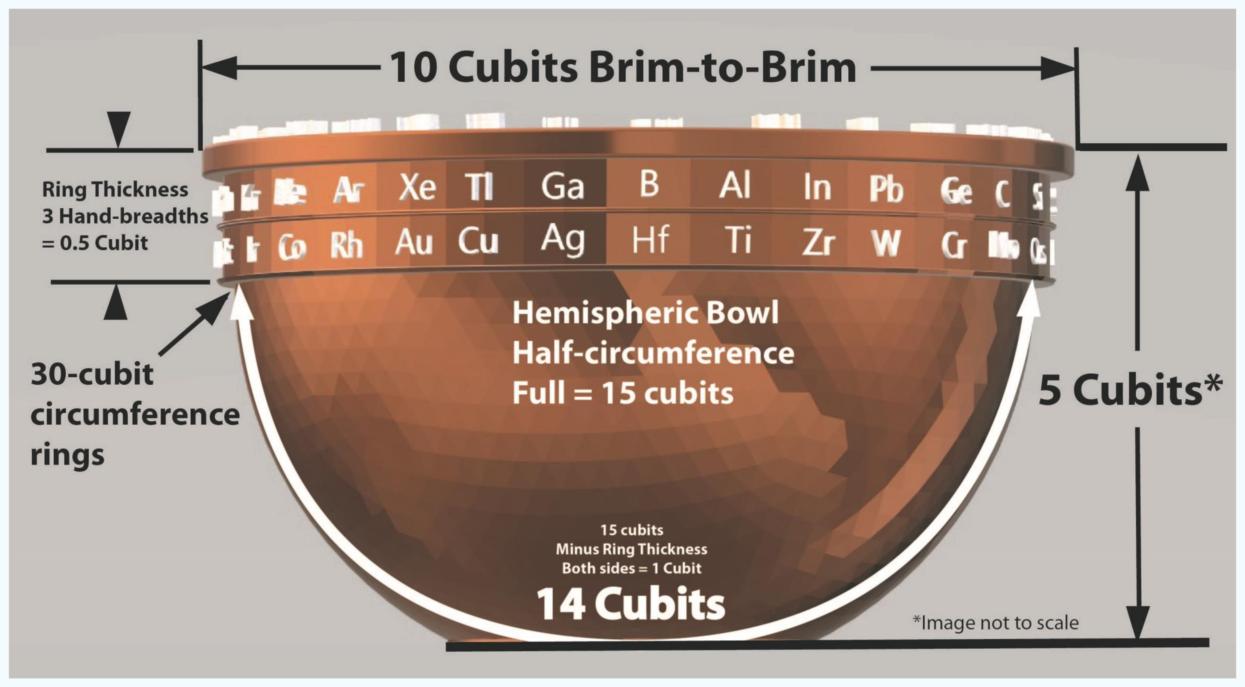


Electronic Shell Model and Aufbau Principle

The Shell Model of Electronic Orbitals provides a means of expressing the order in which electrons form energy levels within an atom. Based in principle quantum number *n*, the number of electrons present in a particular shell man be calculated using the formula $2n^2$, where *n*-values from 1 to 4 represent the K, L, M, N shells, respectively. The shell diagram for Radon above illustrates the positions of K, L, M, N-shells with their 2, 8, 18, 32 electrons, respectively. The arrow diagram above right show the filling order of the sub-shells, or orbitals *s, p, d, f,* based upon their energy levels. The Aufbau Principle states that the electronic orbitals of an atom fill (or "build up") according to their respective energy levels, with lowest energy orbitals being filled first. As will be discussed, the MS could be a three-dimensional representation of these principles.





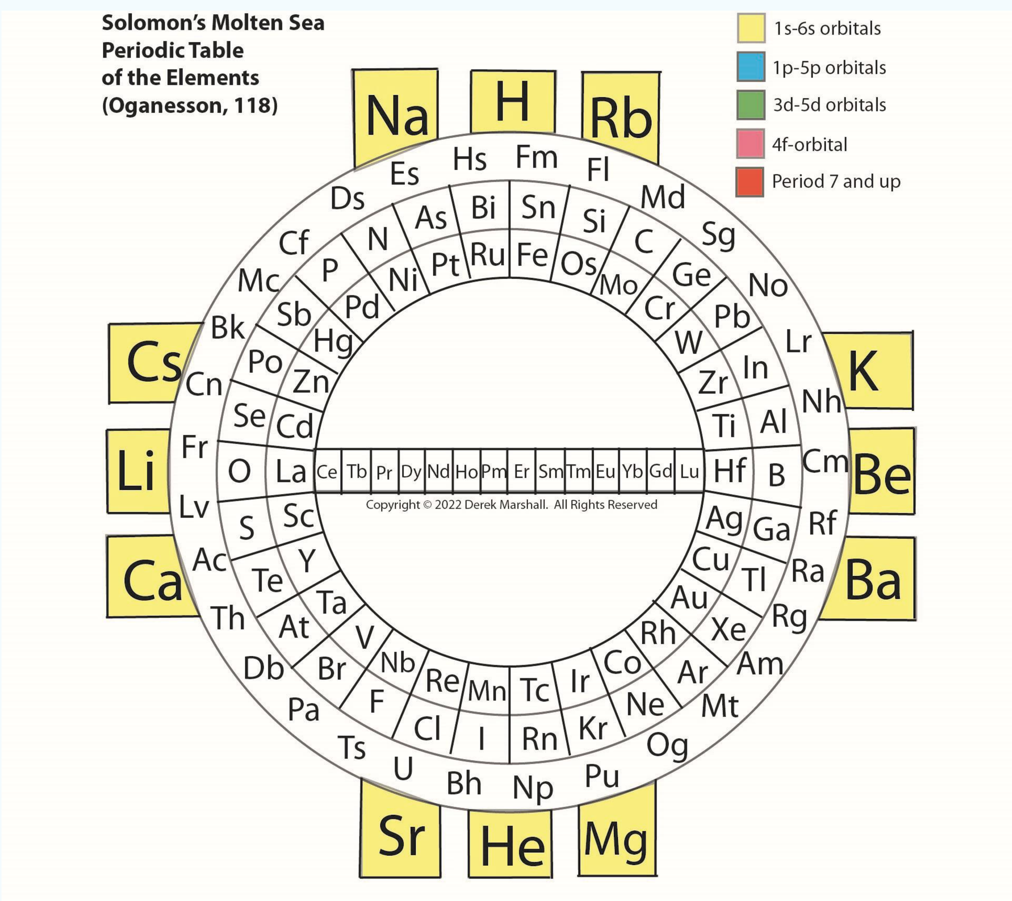


Observations

The Molten Sea has five main features, four of which are described in the text. First are the 12 oxen, which form the base of the structure. Second and third are the two 30-cubit ring structures that encircle the vessel. The fourth feature is the 10-cubit diameter lip. We compared the Sea to a Radon atom, with its 12 *s*-orbital electrons, 30 *p*-orbital electrons and 30 *d*-orbital electrons. To account for Radon's 14 *f*-orbital electrons, we consider the fifth feature of the MS; the bowl situated below the rings. Using the hand-breadth (hb.) thickness given from text, and assuming a ½ hb. bend radius and ½ hb. rings and space between rings it was determined that the lip and the rings occupy 3 hb. on each side. Assuming 6 hb./cubit, the lip and rings fill up one cubit of the Sea's 15-cubit hemispherical shape, leaving 14-cubits below. Measuring 14 cubits, the bowl could represent the 14 *f*-orbital electrons. Now taking the lip into consideration, we compare the MS to an Oganesson atom, the last element of the PTOE, by adding the 7^{th} period of the table. With a stated diameter of 10 cubits, the lip measures 31.4 cubits in circumference. This is where the complete 32-element 7^{th} period of the PTOE could reside, if relativistic effects are taken into consideration. As the lip was hand-tooled with lilies, we note that last twenty-six elements of the 7^{th} period of the PTOE are also synthetic, and man-made. The first six elements of the 7^{th} Period are naturally occurring.

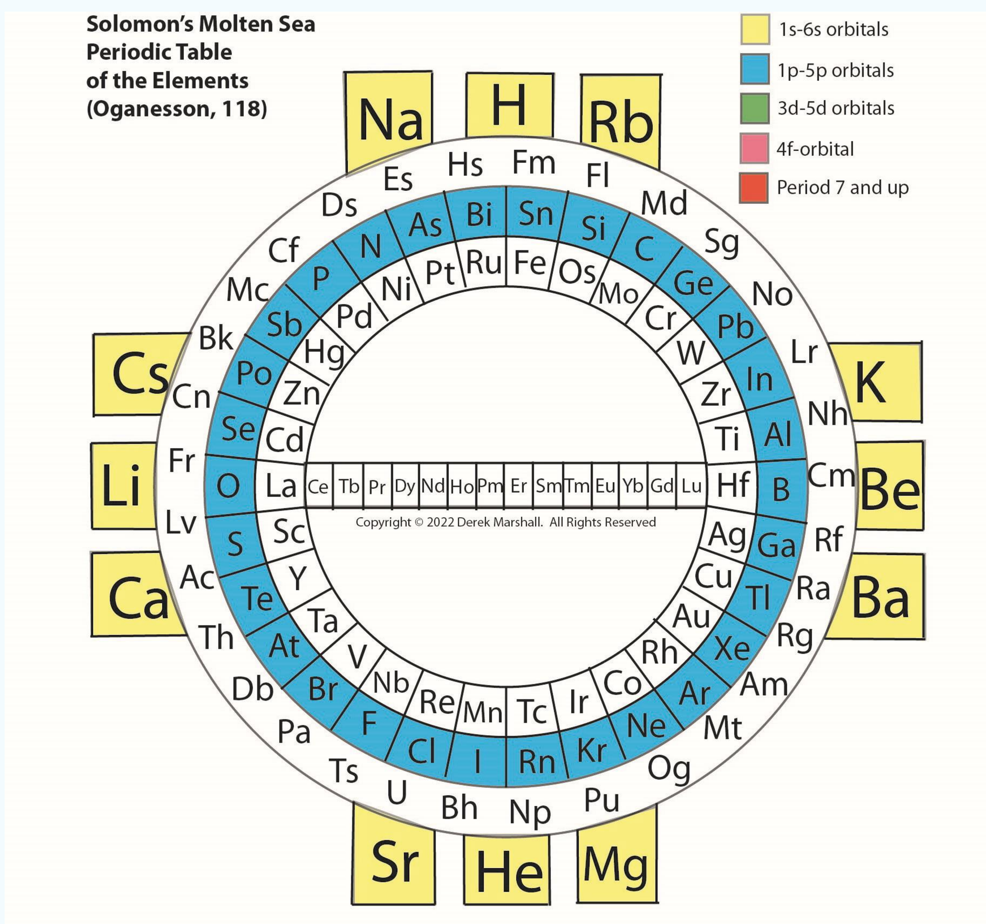
s-orbitals, 12 oxen

The 12 oxen form the base on which the bowl structure rests. They are arranged in threes, but may also be viewed as paired opposites. In this way we may build up the structure, first with two opposing oxen, e.g. Hydrogen (H) and Helium (He). This corresponds to the s-orbital behavior feature two occupancies available for electrons with "up" and "down" spin quantum numbers. Also, since the cattle are on a flat plane, they would exhibit no angular velocity, corresponding to an ℓ quantum value of zero.



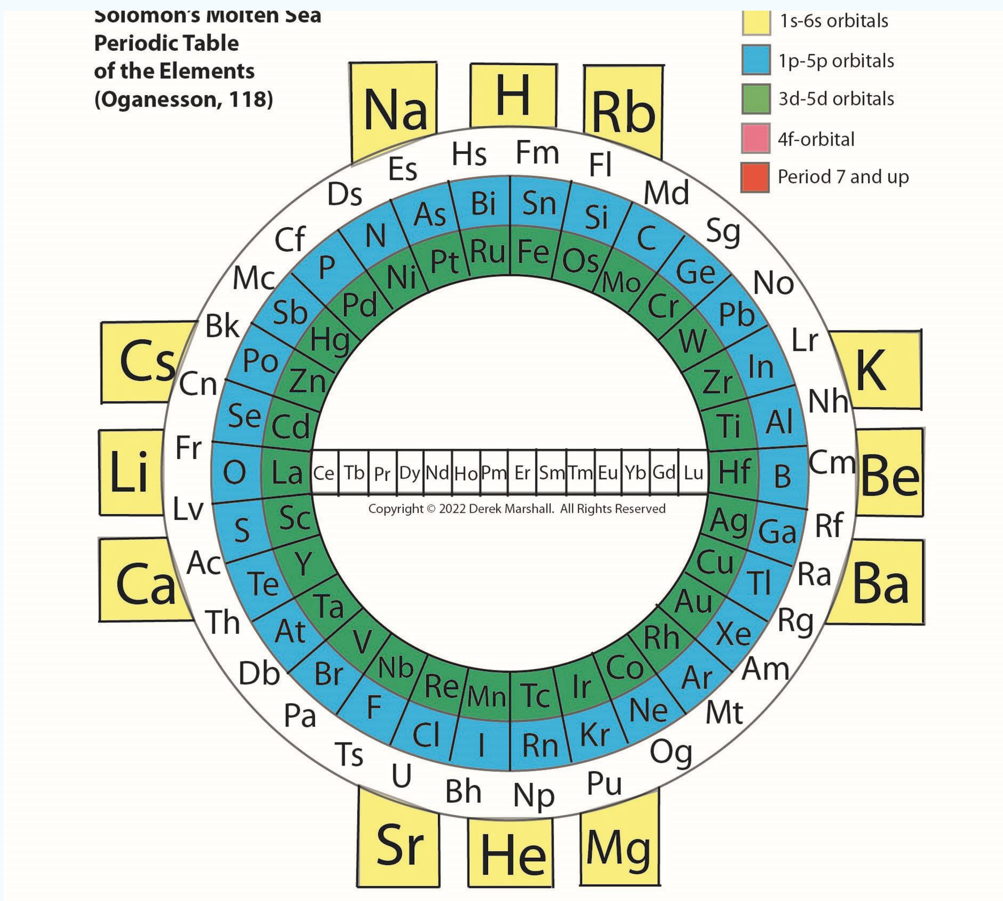
p-orbitals, 30 cu.

The 30-cubit circumference upper ring could represent the occupancies of the p-orbitals through the 6^{th} period of the PTOE. As part of the circular bowl structure, this ring can exhibit the angular momentum, magnetic, and spin qualities given by the ℓ, m, and s quantum numbers. We follow Hund's Rule by having one side filling before the other side, as the oxen did. Elements form the PTOE groups by being next to each other on the ring, thus retaining similar chemical properties.



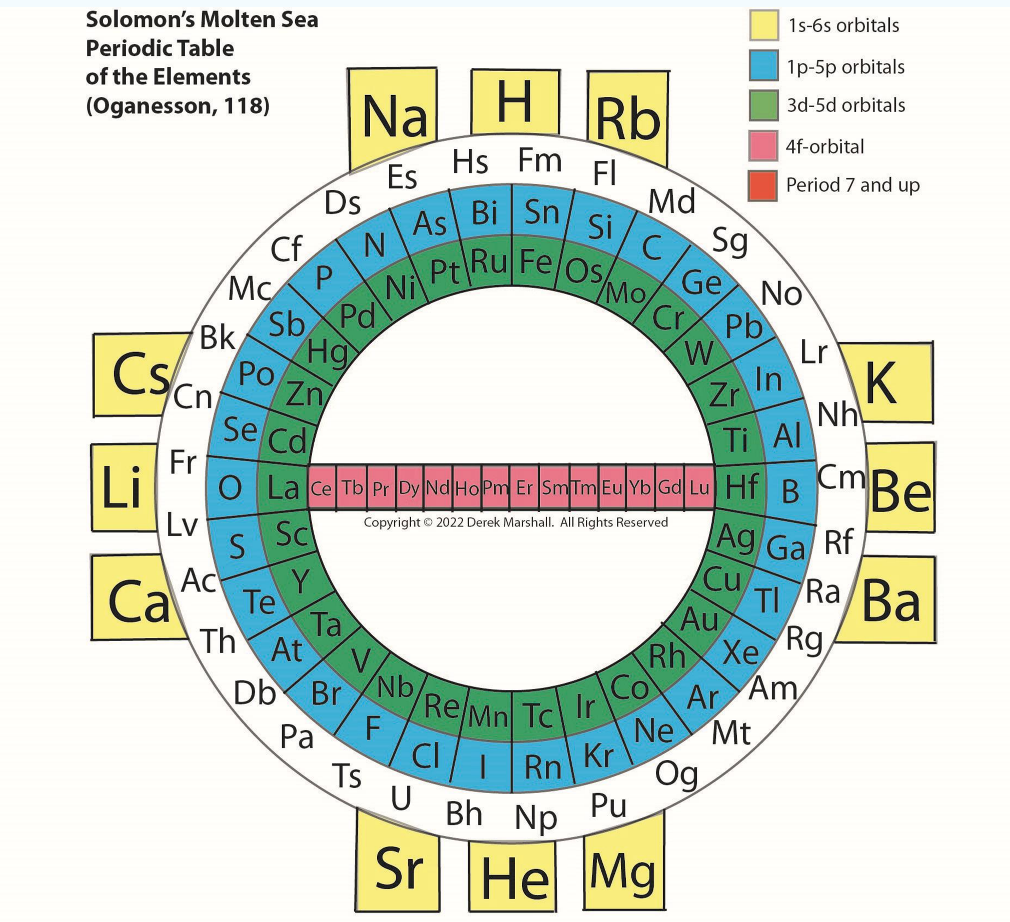
d-orbitals, 30 cu.

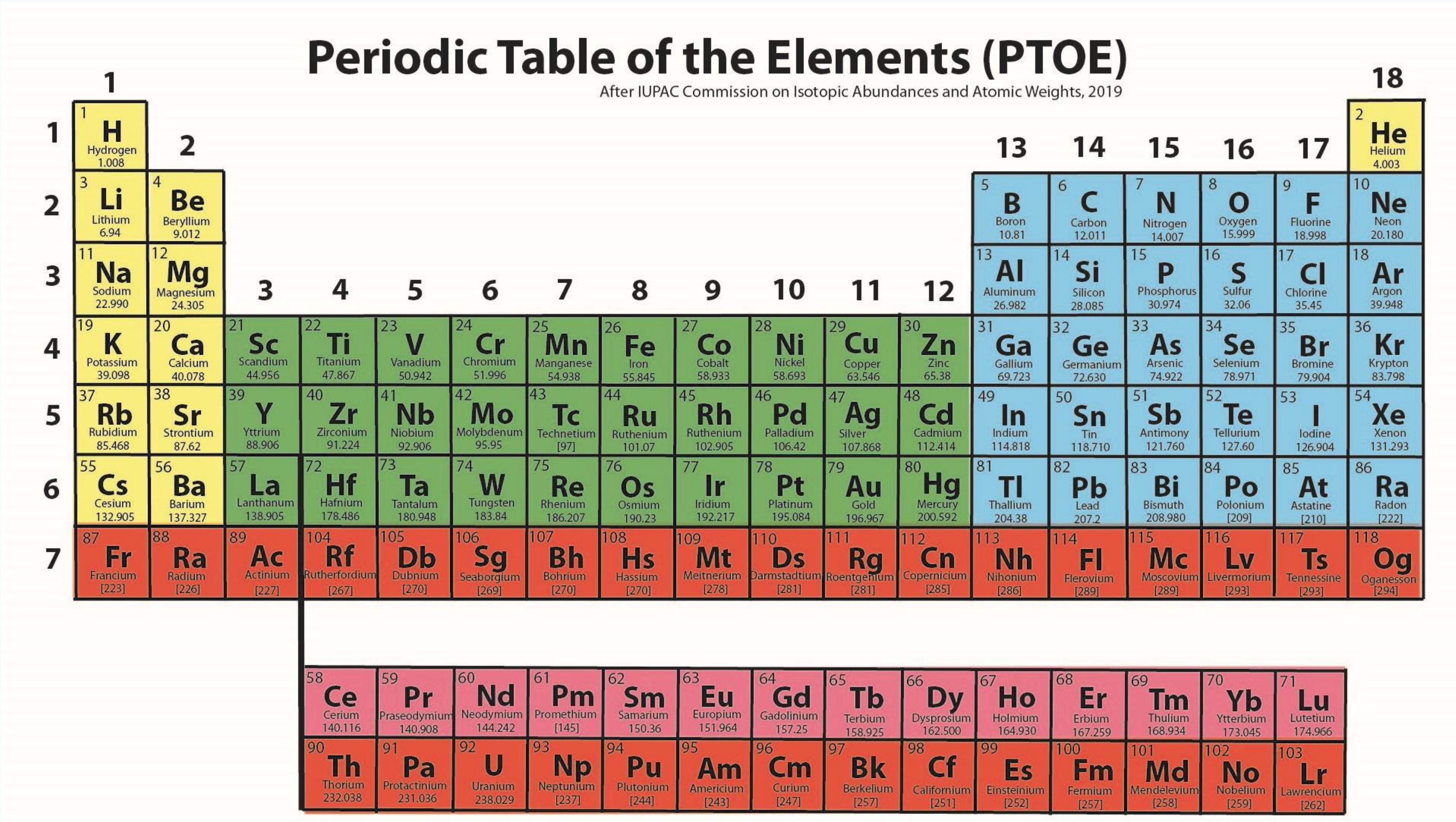
The 30-cubit circumference lower ring may represent the occupancies of the d-orbitals through the 6^{th} period of the PTOE. Similar to the upper ring, this band can exhibit the angular momentum, magnetic, and spin qualities given by the ℓ, m, and s quantum numbers. We keep Lanthanum (La) and Hafnium (Hf) opposite each other and fill the other elements in accordingly. Elements form the groups by being next to each other on the ring, thus retaining similar chemical properties.



f-orbital, 14 cu.

The 14-cubit circumference lower bowl may represent the occupancies of the f-orbitals through the 6^{th} period of the PTOE. Similar to the rings, this band can exhibit the angular momentum, magnetic, and spin qualities given by the ℓ, m, and s quantum numbers. The bowl structure provides a natural f-orbital "bridge" between Lanthanum (La) and Hafnium (Hf) that is not featured on conventional tables. The f-orbital half-ring forms the lower bowl structure, and could represent more degrees of freedom to fill electronic occupancies in quantum angular momentum space.





Period 7, 31.4 cu

The brim of the Sea was wider than the bowl itself, spilling over with hand-tooled lilies. Only six of the radioactive elements {Fr, Ra, Ac, Th, Pa, U} of Period 7 are naturally occurring; the other 26 are synthetic, man-made. The orbitals of superheavy elements such as Og, due to relativistic effects, may be subject to length contraction. Because of this, Og is predicted to be a solid, not a gas. This may allow the 32 elements of Period 7 to "exist" in the 31.4 cubit "space" given by the model.