CRYPTORISMS

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Note: Cryptorisms are not necessarily cryptic, clear, or concise.

1. Do not be heedless

    1.1 Thus spoke the Blessed One

    1.2 Or else be heedless, both heedless and heedful, or neither. Make up your mind as to the results of any such course of action.

    1.3 The heedful swim against the stream

    1.4 FIELDS (a translation). A farmer has three primary duties.

    - A farmer first of all makes sure the field is well ploughed and tilled.
    - Next they plant seeds in season.
    - When the time is right, they irrigate the field and then drain it.

2. To Lazarus Long: being a factotum is not necessarily eudemonic

    2.1 Don't try so hard

    2.2 Or do try so hard and see what happens (you *will* get tired)

3. Alchemy is real

    3.1 It is called nuclear transmutation

4. ASTRONOMIA SUMMA SCIENTIA

    4.1 Not to be confused with ASTROLOGIA

    4.1.1 Here is what Raymond Smulliyan has to say about astrology:

> Even though I do not believe in astrology, if I had my choice of believing in astrology, or in being intolerant of astrology, I would far rather believe in astrology.

4.2 Calm down, the lower sciences have their place

4.3 FERGUSON (1757).

> Of all the sciences cultivated by mankind, Astronomy is acknowledged to be, and undoubtedly is, the most sublime, the most interesting, and the most useful. For, by knowledge derived from this science, not only the bulk of the Earth is discovered . . . ; but our very faculties are enlarged with the grandeur of the ideas it conveys, our minds exalted above [their] low contracted prejudices.[1]

4.4 For starters, I'd highly recommend *Astrophysics for People in a Hurry* by Neil deGrasse Tyson.

4.5 My favorite astronomical fact: There are a couple hundred billion stars in our Galaxy, many of them with various exoplanets. And there are more than trillions of galaxies in the observable universe alone, many of them with various dwarf galaxies...

4.6 My second-favorite astronomical fact concerns the cosmic origin of the elements (Figure 1). Did you know gold and silver come from merging neutron stars?
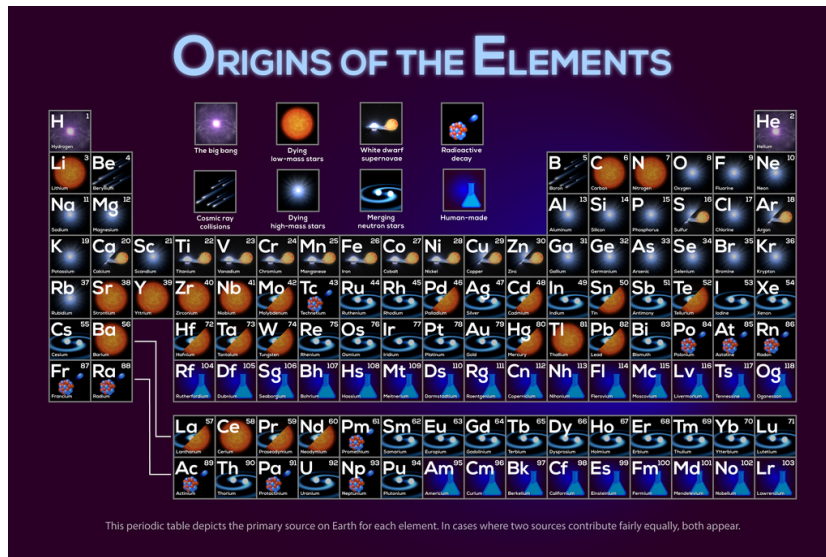
Figure 1: The origin of the Elements

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5. Ever heard of Bámigbóyè?

    5.1 9780300266559

6. Koyaanisqatsi

    6.1 We need a billion climate activists

7. cxxi. Grysomyle Nosesmart þrī Xylocinnamon Musculosity Kernelling[1]

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[1]Hi! I can tell you are confused. I like codes, cyphers, and obfuscation. Most of all, I like *compression*, mere letters encapsulating amphorae full of cosmosophy. However, to help you out, I will help you decipher this aphorism. The left-most number, 121, is the Dewey Decimal classification for Epistemology. What follows are obscure plant terms from my obsolete phonetic plant alphabet, with the old English numeral þrī inbetween. All in all, this translates to GN3XMK, which is a shortDOI code pointing towards "The Quest for a Global Age of Reason. Part I: Asia, Africa, the Greeks, and the Enlightenment Roots" by Dag Herbjørnsrud, an essential starting point for a voyage far beyond the Westimological shores. You can find the article for free on PhilPapers. For starters, readers will be treated to the juicy quote below. Those that dare to read further will find worlds and worlds…

> Man is an absurd animal—yea, I will ever maintain it—in his vices, dreadful—in his few virtues, silly—religious without devotion—philosophy without wisdom—the divine passion (as it is called) love too oft without affection—and anger without cause—friendship without reason—hate without reflection—knowledge (like Ashley's punch in small quantities) without judgement—and wit without discretion.
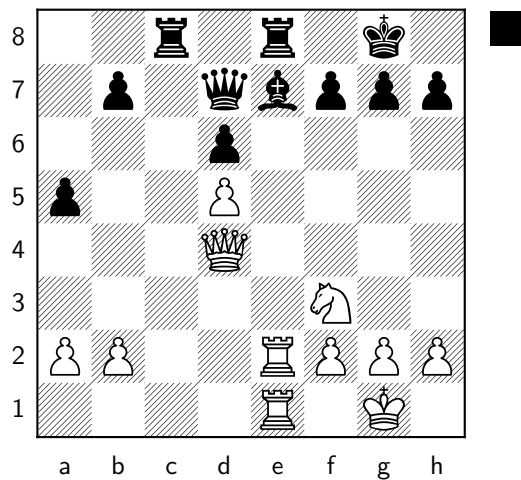> **Ignatius Sancho (1729–1780), letter to John Meheux, August 7, 1777**

7.1 Are you a *mr-rḥ*? Do you have *mr* and *rḥ*?

7.2 A true epistemologist is one who listens to everyone with love and understanding

8. Your intuition is often wrong

8.1 Use this information as you see fit

8.2 ADAMS VS. TORRE (1920) (minor variation). Why does the seemingly logical Bf6 fail?

8.3 Ever read *Counterexamples in Topology*?

8.4 ARROW (a fictional retelling based on Maskin (2019) and the 2007 Bhutanese mock elections). The King of Bhutan wishes to issue elections. Citizens can vote for **Druk Blue** to fight corruption and extend free health care and education, **Druk Green** for environment-friendly development, or for **Druk Red** to promote industrialization. (In 2007, voters could also pick **Druk Yellow** to preserve and promote Bhutan's rich cultural heritage and traditions.) So the King summons his counsellors to decide on a voting procedure to establish a ranking among the three parties—the highest-ranked party gets 25 out of 50 seats in the Bhutanese parliament, the second-ranked party 15, and the third-ranked party 10. The King lays out the following eminently reasonable demands.

- **"Unrestricted domain:"**
  The procedure must produce a ranking (e.g., **Druk Red** > **Druk Blue** > **Druk Green**) for all possible combinations of individual votes.

- **"Pareto property:"**
  If all voters strictly prefer **Druk A** above **Druk B**, than **Druk A** should gain more seats in the parliament.

- **"Independence of Irrelevant Alternatives:"**
  Social preferences between parties **Druk A** and **Druk B** should only depend on individual's preferences between **Druk A** and **Druk B**, not on their preferences for **Druk C**.

- **"Nondictatorship:"**
  There exists no individual who always get his way, meaning that if this individual prefers **Druk A** above **Druk B**, **Druk A** will have more seats than **Druk B** regardless of others' preferences.

After many unsuccessful attempts at designing a system that satisfies the King's demands, the royal advisors start to get desperate. Not long after, the King receives a letter from an esteemed Bhutanese mathematician. "In fact," the mathematician says, "it can be proven that no voting system satisfying conditions (a)-(d) could possibly exist."[3]

8.5 BANACH & TARSKI (Rayo). Assume the Axiom of Choice. Then it is possible to decompose a ball into a finite number of pieces and reassemble the pieces (without changing their size or shape) so as to get two balls, each of the same size as the original.[4]

8.6 BAUER & HANSON. You might have understood Cantor's diagonalization argument and believe that the reals are always uncountable. But one can create a topos in which the reals are countable.[5]

8.7 BROWN. There are certainly more than ten dwarf planets orbiting the Sun, likely more than one hundred, and possibly more than one thousand.[6]

8.8 CHRISTODOULOU & ROVELLI. The volume of even a small, stellar black hole, is larger than the volume of the entire observable universe.[7]

8.9 DIACONIS. A coin toss is not exactly 50/50—not even with a fair coin. Nevertheless, a fair 50/50 flip can be executed—even with a biased coin. (How?)

8.10 EINSTEIN. Space and time are not absolute. (I never cease to be amazed!)

8.11 EUGENIA CHENG. Societies benefit greatly from "congressive" citizens (collaborative, emphasizing community and interdependence), but its struc-

tures are often mostly "ingressive" (competitive, prioritizing individualism and independence).[8]

8.12 ERLANG (John Cook). A local bank opens a new branch with one teller. Customers take on average 10 minutes to serve, and arrive at a rate of 5.8 per hour. Not long after, the average waiting time is 5 hours. The next day they open with two tellers and the average waiting time is just three minutes throughout the day.[9]

8.13 LUMP OF FOAM (paraphrased). There is nothing of substance in yourself —neither form nor feeling tones nor nor perception nor volitions nor consciousness. Careful investigation will show that it's all hollow and void.[10]

8.14 FREUD & FERENCZI. People undermine their own well-being and goals ("self-sabotage").

8.15 GIFFEN. Increasing the price of bread makes poor people buy more bread.

8.16 GÖDEL (Rayo). You might believe mathematical proofs establish incontrovertible truths. But you would (mostly) be mistaken. Mathematical theories (in sufficiently rich languages) cannot be established beyond any possibility of doubt.[11]

8.17 KASPAROV.

> Dictators lie about everything they have done, but often they tell us exactly what they're going to do.[12]

8.18 KETTERLE. When cooled sufficiently, matter can be made invisible ("Pauli blocking")[13]

8.19 KIRSCHVINK. Once upon a time, the earth was a giant snowball.

8.20 KOSHIBA. Every second, about 100 trillion neutrinos pass through your body. (Neutrinos, however, are *very* light, so one hundred trillion neutrinos weigh at most 160 zeptograms.[14])

8.21 LAMBDA-CDM (Katie Mack). If you have galaxies of the same size at different distances, beyond a certain distance, the *farther* away the galaxy is the *bigger* it appears in the sky.[15]

8.22 LEVINTHAL. Proteins can have a googol cubed (10^{300}) conformations but fold spontaneously on a millisecond time scale to a predictable conformation.[16]

8.23 LOUGHNAN. People profess to care about animals yet embrace diets that involve harming them (the "meat paradox").[17]

8.24 NEWTON (a rephrasing). For every drop of *known knowns* there are oceans and (exo-)oceans of *unknown unknowns*.

8.25 ORESME. There exist geometric objects with a finite volume but infinite surface area. Gabriel's horn can be filled with a couple liters of paint, but to cover its surface you would need an infinite amount![18]

8.26 PERLMUTTER, SCHMIDT & RIESS. The expansion of the universe is accelerating ("dark energy").

8.27 POPPER. Unlimited tolerance must lead to the disappearance of tolerance.

8.28 PYYKKÖ & DESCLAUX. Gold is golden rather than silver because of relativistic effects. (Its inner electrons travel with ~58% of the speed of light.)[19]

8.29 SAGAN.

> The cosmos is within us. We are made of star stuff. We are a way for the cosmos to know itself.[20]

8.30 SARTRE. Some people understand themselves diachronically, others synchronically.

8.31 SCHIAPARELLI, OLBERS. The tallest (known) mountain in the solar system is not Mount Everest but either *Olympus Mons* on Mars or the mountain peak in the centre of the Rheasilvia crater on the asteroid Vesta.

8.32 SCHWINGER, GEIM. With a sufficiently strong electric field, you can forge matter out of the vacuum.[21]

8.33 SENDER, FUCHS & MILO. There are about as many bacteria in the human body as there are human cells.[22]

8.34 Siegel. (a) The age of the universe is 13.8 billion years (an amazing fact by itself!). Yet the diameter of the observable universe is 93 billion light years.[23] (b) The universe has no center.[24] (c) The universe is expanding—but us humans, the Earth, and Sun, and our Galaxy are not.[25]

8.35 SIMPSON. A prominent university decides to investigate gender bias in admissions to its graduate program. To its horror, the board of directors discovers that female applicants are significantly more likely to be rejected

than male applicants (65% vs 56%). However, after talking to the department heads, it turns out that women are, in fact, more likely to be admitted than men in each of the school's faculties!

8.36 SMULLYAN (Gallagher). The following Herculean task is doable:

> Three gods A, B, and C are called, in some order, True, False, and Random. True always speaks truly, False always speaks falsely, but whether Random speaks truly or falsely is a completely random matter. Your task is to determine the identities of A, B, and C by asking three yes-no questions; each question must be put to exactly one god. The gods understand English, but will answer all questions in their own language, in which the words for "yes" and "no" are "da" and "ja," in some order. You do not know which word means which.[26]

8.37 STEIN (a retelling). Renenutet, the Egyptian goddess of harvest, inspects the three crops entrusted to her: maize, wheat, and rice. She measures the length of one maize plant. Three meters. So maize will most likely grow to three meters this year on average, Renenutet reasons. Then she scales one of her rice plants. One-and-a-half meters. So, she infers that her average rice plant is most likely one-and-a-half meters in size. Finally, she measures the wheat. One meter. But by now Renenutet knows too much, and necessarily concludes that one meter is not a good guess for the size of the average wheat plant—and, in fact, 1.5 meters not a good guess for her rice, and even estimating the average maize stalk as 3 meters tall would be a mistake. Renenutet is right—but why?[27]

8.38 VEBLEN. Increasing the price of luxury goods makes rich people buy more of them.

8.39 YOHUA WANG. A coherent elite that could take collective actions to strengthen the state was also capable of revolting against the ruler.[28]

8.40 WHITEHEAD & RUSSELL. You might think that $1 + 1 = 2$ is an elementary fact. But a bored mathematician-philosopher might scrutinize the meaning of any of the symbols in this equation (1, $+$, $=$, and 2) or dedicate hundreds of pages toward proving that $1 + 1$ in fact equals 2.

8.41 WU. Like the ancient Greeks, you might think that the Laws of Nature are perfectly symmetrical and do not discriminate between left and right

(physicists call this *parity*). You would be almost correct, but not completely: Nature *does* distinguish left from right. In the words of Richard Feynman:

> So our problem is to explain where symmetry comes from. Why is nature so nearly symmetrical? No one has any idea why. The only thing we might suggest is something like this: There is a gate in Japan, a gate in Nikkō, which is sometimes called by the Japanese the most beautiful gate in all Japan; it was built in a time when there was great influence from Chinese art. This gate is very elaborate, with lots of gables and beautiful carving and lots of columns and dragon heads and princes carved into the pillars, and so on. But when one looks closely he sees that in the elaborate and complex design along one of the pillars, one of the small design elements is carved upside down; otherwise the thing is completely symmetrical. If one asks why this is, the story is that it was carved upside down so that the gods will not be jealous of the perfection of man. So they purposely put an error in there, so that the gods would not be jealous and get angry with human beings.
>
> We might like to turn the idea around and think that the true explanation of the near symmetry of nature is this: that God made the laws only nearly symmetrical so that we should not be jealous of His perfection!
>
> **The Feynman Lectures on Physics 52–9: Broken symmetries**

8.42 WUZONG ZHOU. Every second a candle flame burns, it produces one-and-a-half million nanodiamonds.[29]

8.43 ZWICKY, RUBIN. Most of gravity is unaccounted for—galaxies spin too fast ("dark matter").

9. MATHEMATICA SUMMA ARS

9.1 Calm down, there is nothing wrong with lower arts such as architecture.

10. Pseudoscience is apophenia

10.1 Sound and valid arguments : science :: unsound or invalid arguments : pseudoscience

10.2 Pseudoscience can be a lot of fun when not taken too seriously.

    10.2.1 Don't be harsh toward horoscope and tarot enthusiasts—instead, enjoy their company and have fun!

11. Science is cartographic

11.1 Scientists are cartographers

11.2 Science enthusiasts are cartophiles

11.3 *Pace* Carroll (2022), we do not "supervene on quantum fields." Presuming otherwise might be an instance of Jolly's falacy:

> *Als er [Max Planck] sich bei Philipp von Jolly nach den Aussichten eines Physikstudiums erkundigte, riet dieser dringend ab: In der Physik sei im wesentlichen schon alles erforscht, und es gaebe nur noch einige Luecken auszufuellen* (1874).

11.4 In particular, math does not represent (Curiel)

12. Lift a stone and you can see woodlice crawling everywhere

12.1 Lift stones. Expose the woodlice.

12.2 Better yet, remove the stones, so the woodlice have nowhere to hide.

12.3 If the woodlice are crawling in the open, this is a problem.

13. The world is a messy place

13.1 Even the vacuum is messy (QCD).

13.2 Be an imperfectionist.

    13.2.1 Or fight reality, and suffer from the mental disorders that accompany perfectionism—there is a large literature on this.

Notes

[1] James Ferguson, *Astronomy Explained Upon Sir Isaac Newton' s Principles, And Made Easy To Those Who Have Not Studied Mathematics* as quoted in *Astrophysics for People in a Hurry* by Neil deGrasse Tyson

[2] Image credit: NASA's Goddard Space Flight Center.

[3] doi:10.1146/annurev-economics-080218-030323

[4] *On the Brink of Paradox: Highlights from the Intersection of Philosophy and Mathematics*

[5] See the following talk.

[6] `http://web.gps.caltech.edu/~mbrown/dps.html`

[7] `https://arxiv.org/pdf/1411.2854.pdf`

[8] doi: 10.1038/d41586-020-02205-8

[9] See John D. Cook's blog post or verify the result for yourself with the following calculator.

[10] SN 22.95

[11] *On the Brink of Paradox*

[12] See Tweet

[13] See MIT News article.

[14] doi:10.1038/s41567-021-01463-1

[15] Some of the counterintuitive facts are taken from the following blog post by Alexander Kruel. See here for Katie Mack's Twitter thread about this.

[16] See the Wikipedia article on Levinthal's paradox. Apparently the paradox has now been solved.

[17] See, e.g., *The Meat Paradox: Eating, Empathy and the Future of Meat* by Rob Percival.

[18] MathWorld entry

[19] doi:10.1021/ar50140a002

[20] See the Quote Investigator investigation for the provenance of these quotes.

[21] Some very cool research indeed

[22] doi:10.1371/journal.pbio.1002533

[23] `https://www.forbes.com/sites/startswithabang/2019/02/26/how-did-the-universe-expand-to-46-billion-light-years-in-just-1?sh=1eaff0005c04`

[24] `https://medium.com/starts-with-a-bang/ask-ethan-where-is-the-center-of-the-universe-c3d5ae16f63e`

[25] `https://www.forbes.com/sites/startswithabang/2020/11/06/ask-ethan-if-the-universe-is-expanding-are-we-expanding-too/?sh=61945dd33eb2`

[26] The Nautilus Magazine article is great

[27] See, e.g., Efron & Morris (1977), "Stein's Paradox"

[28] `https://twitter.com/YuhuaWang5/status/1575132726671204353?s=20&t=gAhFd6vhIwHurPOersI-EA`

[29] `https://www.bbc.com/news/uk-scotland-edinburgh-east-fife-14564702`