

Convention and Fact — Poincaré's Conventionalism and the Corpus's "Scaffolding" (the Defined Value of c , Unit Conventions) — [Paper 95]

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— *From thinking to syncing.* —

ABSTRACT

The corpus has repeatedly separated "**the description we choose (the Layer-2 lens)**" from "**the fact nature forces (Layer 1)**." The philosopher who first drew this distinction sharply was Henri Poincaré, with his **conventionalism**. In *Science and Hypothesis* (1902) he argued that **the geometry of space (Euclidean/non-Euclidean) is not forced by nature but is a convention chosen for convenience** — in his famous words, "One geometry cannot be more **true** than another; it can only be more **convenient**." For geometry is tested **only together with the physical laws** (measuring rods, light rays, force laws), and if you change the geometry you can adjust the physics to keep the same observations. This paper applies that discipline to the corpus's "scaffolding." The corpus's " **c is scaffolding (a defined value)**" — c has been an **exactly defined constant since the 1983 definition of the metre** (the 2019 SI revision extended this, fixing h, e, k_B, N_A as defining constants), so its **numerical value is a convention**, not a measured fact (Paper 66). By contrast, that **c is finite** (an invariant speed exists; Paper 83), that **gravity (curvature) exists**, that **space is nearly 3-dimensional** (Paper 69) are not conventions but **facts forced by experiment**. Poincaré gives a rigorous name to this **splitting of convention from fact**. **But honestly:** Einstein's general relativity made spacetime geometry dynamical and empirical, **limiting strict conventionalism** — geometry is tested (with physics) by experiment. So the correct position is "the whole geometry+physics package is constrained by experiment, with a conventional split remaining inside," **not "everything is convention, anything goes."** **Scope:** a Layer-2 structural interpretation of philosophy of science; no new mathematics and no new prediction. The Universe OS is a Layer-3 non-science lens.

Positioning of this paper (discipline): This paper is a **structural interpretation** of established philosophy of science (Poincaré's conventionalism, Reichenbach's coordinative definitions, the 2019 SI defining constants). It contains no new mathematics and no new prediction. The point is to **separate convention (the description/units we choose) from fact (what experiment forces)** — the philosophical backbone of the corpus's three-layer discipline. **It does not over-extend conventionalism** — experiment constrains the whole geometry+physics package (convention $\neq$ anything goes). "Universe OS" is a Layer-3 non-science lens, not a claim of mechanism.

1. Introduction: "What We Choose" and "What Is Forced"

The corpus has carefully separated two things — **the description we choose for convenience** (the Layer-2 lens, units, coordinates) and **the fact nature forces** (Layer 1, what experiment tests). The one who drew this distinction most sharply, over a century ago, was Henri Poincaré, with his **conventionalism**. Poincaré is also a hero of the corpus (the reading of the 3D/4D Poincaré conjecture, Papers 07/08; the recurrence theorem, Paper 81). This paper applies his **philosophy** to the corpus's "scaffolding."

This paper builds no new theorem. It introduces Poincaré's discipline of separating convention from fact, shows how it correctly places the corpus's "**c** = scaffolding" (Paper 66) and its unit conventions, and then honestly records the **limit of conventionalism** (the empiricization of geometry by GR).

2. Poincaré's Conventionalism: Geometry Is Not "True" but "Convenient"

Standard Fact (conventionalism, *Science and Hypothesis* 1902)

Poincaré argued that whether the geometry of space is Euclidean or non-Euclidean is **not something experiment decides on its own**. Because geometry is tested **inseparably together with the physical laws** (instruments, light rays, force laws), changing the geometry and adjusting the physics can reproduce the same observations. Hence the choice of geometry is a **convention**, and the criterion of choice is not truth but **convenience and simplicity** — "One geometry cannot be more true than another; it can only be more convenient."

This was a deep insight. What experiment answers is always the **bundled package "geometry + physics,"** not geometry cut out alone for a verdict of true or false. Therefore, where to draw the line — how much is geometry (the frame of description) and where physics (force) begins — carries an element of **our choice (convention)**.

3. Convention Is Not "Anything Goes"

A misreading must be blocked at once. Conventionalism is not "you may freely choose any geometry (anything goes)." First, **experiment sternly constrains the whole package (geometry + physics)** — the packages fitting observation are limited. Second, conventions are chosen for **convenience and simplicity** — for many purposes one choice is overwhelmingly convenient. So what conventionalism says is that there is freedom in the **dividing line** between geometry and physics, not that observations may be ignored. **Convention $\neq$ arbitrariness** (the same spirit as Reichenbach's coordinative definitions: which thing counts as a "straight line / rigid rod" is a coordination, but once fixed, experience speaks).

4. Splitting the Corpus's "Scaffolding" into Convention and Fact

Standard Fact (the 2019 SI and defining constants)

The speed of light c has been an **exactly defined** constant, $c = 299\,792\,458$ m/s, since the **1983 definition of the metre** (the metre being defined via c). The 2019 SI revision extended this policy, fixing h , e , k_B , N_A as **defining constants**. That is, the **numerical values** of these are now conventions (agreements), not measurement results.

Observation 4.1 (c = scaffolding is a convention; the finiteness of c is a fact)

The corpus's " **c is scaffolding (a defined value)**" (Paper 66) means, in Poincaré's words, that the **numerical value** of c is a convention (a unit agreement), not a measured fact. Likewise, a unit choice such as $G = 4\pi$ (the notation of Papers 02/13) is a convention. **On the other hand there are clear facts, not conventions:** that c is **finite** (that an invariant speed exists — Paper 83 derives this from a few axioms), that **gravity (curvature) exists**, that space is **nearly 3-dimensional** (Paper 69). Poincaré's conventionalism gives a philosophical name and edge to the corpus's three-layer discipline — **Layer 2 (convenient description, lens, units = convention)** and **Layer 1 (fact forced by experiment)**.

5. An Honest Nuance: General Relativity and the Limit of Conventionalism

In fairness, the **limit** of conventionalism must be recorded. Einstein's general relativity made the geometry of spacetime a **dynamical, empirical object** — matter curves spacetime, and that curvature is tested by observation (light bending, Mercury's perihelion, gravitational waves). This **limits strict conventionalism**, which would regard geometry as pure convention. The moderate position today is: **the "geometry + physics" package is constrained by experiment**, while there remains conventional freedom in **how to split that package into geometry and physics, which coordinates and which "rigid rod / straight line" to adopt** (coordinative definitions). The corpus's " c = scaffolding" can be stated precisely along this line — the **value** of c is a convention, the **finiteness** of c and the physics are fact. **Do not over-swing conventionalism into "everything is an agreement"** — this too is the corpus's discipline.

6. Connection to the Corpus

This paper gives the three-layer split the corpus has practiced (Layer 1 = fact forced by experiment / Layer 2 = convenient description, lens) its **philosophical backbone** in Poincaré's conventionalism. The corpus's stance of Newton's "hypotheses non fingo" — not asserting causes, describing relations — lies on this same line (cause vs relation). Poincaré (a hero of the corpus, 07/08/81) bequeaths not only theorems but the very **discipline of asking "what is convention and what is fact."** It

adds no new theorem or prediction. Its contribution is only to give the corpus's word "scaffolding" the correct split of convention and fact.

The Author's Personal Note (Layer 3, non-science label / not a claim of mechanism)

In the corpus's lens (metaphor), the Universe OS's "description language" — units, coordinates, the value of c — looks like a **convention (a config file) the OS chose**, beneath which nature's facts (finite c , gravity, three dimensions) run. But **this carries the non-science label**. "The OS's config file" is a picture that carries intuition, not a mechanism or a prediction.

What is certain here is only the philosophy-of-science point of separating convention from fact. Not asserting causes, and not mixing the chosen description (convention) with nature's compulsion (fact) — this restraint Poincaré left is the very humility of the corpus's three layers. To the corpus's hero, in the philosophical facet too, we record quiet respect.

7. Scope (What Is Shown, and What Is Not)

What is shown (descriptive, philosophical):

- Poincaré's conventionalism: the choice of geometry (etc.) is not a fact forced by nature but a convention chosen for convenience (§2).
- The corpus's " c = scaffolding (defined value)" and " $G = 4\pi$ " are conventions; the finiteness of c , gravity, and three dimensions are facts — the philosophical backbone of the three-layer discipline (§4).
- Convention $\neq$ anything goes; experiment constrains the whole package, and GR empiricizes geometry, limiting strict conventionalism (§§3, 5).

What is not shown (restraint):

- **Do not over-say "everything is convention."** There are facts forced by experiment. Conventionalism is not a universal weapon.
- **No new mathematics or prediction.** Conventionalism, coordinative definitions, and the SI defining constants are standard. Hence Layer 2 (structural, philosophical). The OS is Layer-3 non-science.
- **Physics and unit systems are not changed.** It only states which convention is convenient; it forces no new convention.

8. Conclusion

The split the corpus has practiced — "the description we choose" vs "the fact that is forced" — has its philosophical name in Poincaré's **conventionalism**. Geometry is a convention chosen for convenience, not truth, and what experiment answers is the "geometry + physics" package — so we **must consciously separate** how much is description (convention) and where

fact begins. The corpus's " $\mathfrak{c}$ = scaffolding" is exactly this discernment: the value of $\mathfrak{c}$ is a convention (an SI defining constant), the finiteness of $\mathfrak{c}$ and the physics are fact (Papers 66/83).

But do not brandish conventionalism. Experiment constrains the whole package, and general relativity empiricized geometry, limiting strict conventionalism. The correct position is "the package is constrained by experience, with conventional freedom remaining inside," not "anything goes." What this paper did is not a new claim but to graft, onto the corpus's three-layer humility, Poincaré as its philosophical backbone, with the correct limits drawn. Do not mix convention with fact — to that restraint, together with the name of the corpus's hero, we return one address.

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