the improbable yet elementary case

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a mathematical paradigmatic mashup: Thomas Kuhn Vs map-territory Vs ...?

prefer the simplest explanation [1]

consider all mathematics as pseudo-mathematics; a means for a novice mathematician to express ideas in less time and fewer words than a similarly novice writer might, in prose. all terms are tentative. corrections $\wedge\vee$ *advice, welcome.*

...

the improbable yet elementary case explores:

1. universal commonality;
2. a toy phenomena-invariant model, and;
3. formally reconciliable maps of arbitrarily related territory

[2]

...

[1] which works

[2] needs updating!

Contents

Part I
foundations

1 paradigm, measure, common measures, incommensurability

(Pa , Me , ${}^{\cap}_{Me}$, ${}^{\cap\varnothing}_{Me}$)

1.1 a gentle introduction

(Pa , Me)

Let us consider a paradigm Pa, as a set of two measures Me_1 and Me_2:

$$Pa = \{Me_1, Me_2\} : |Pa| = 2$$

1.2 totality, commonality

($\cup$, $\cap$)

If paradigm Pa_1, contains measures $Me_{1,2,3}$, and paradigm Pa_2, contains measures $Me_{2,3,4}$:

$$Pa_1 = \{Me_1, Me_2, Me_3\}$$

$$Pa_2 = \{Me_2, Me_3, Me_4\}$$

The *set-of-all* measures ${}^{\cup}_{Me}$, across Pa_1 and Pa_2, can be found by union $\cup$:

$${}^{\cup}_{Me} = Pa_1 \cup Pa_2 = \{Me_1, Me_2, Me_3, Me_4\}$$

The *set-of-common* measures ${}^{\cap}_{Me}$, between Pa_1 and Pa_2, can be found by intersection $\cap$:

$${}^{\cap}_{Me} = Pa_1 \cap Pa_2 = \{Me_2, Me_3\}$$

Observing:

$$|{}^{\cup}_{Me}| = 4 \ , \ |{}^{\cap}_{Me}| = 2 \ , \ |{}^{\cap}_{Me}| < |{}^{\cup}_{Me}|$$

note: remember, this is a simplification, and an introduction

1.3 incommensurability

($\cap\varnothing$) [3]

Consider paradigms Pa_3 and Pa_4, whereby:

$$Pa_3 = \{Me_1, Me_2, Me_3\}$$

$$Pa_4 = \{Me_4, Me_5, Me_6\}$$

When paradigms Pa_3 and Pa_4, do not share common measures, then ${}^{\cap}_{Me}$, is an empty set $\varnothing$:

$${}^{\cap}_{Me} = Pa_3 \cap Pa_4 = \varnothing : |\varnothing| = 0$$

And paradigms Pa_3 and Pa_4, can be said to be incommensurable ${}^{\cap\varnothing}_{Me}$:

$${}^{\cap}_{Me} = Pa_3 \cap Pa_4 = \varnothing : {}^{\cap}_{Me} \rightarrow {}^{\cap\varnothing}_{Me} \ , \ |{}^{\cap\varnothing}_{Me}| = 0$$

$\square$

[3] famously, two paradigms which share no common measures are incommensurable.

2 map territory

($M \mapsto T$)

"a map is not the territory it represents, but, if correct, it has a similar structure to the territory, which accounts for its usefulness" — alfred korzybski, science and sanity, p. 58

The map territory relation [4] will be mathematically reconciled with Thomas Kuhn's *paradigm, measure, common measure, and anomaly* — to conceptually *defamiliarise* [5], re-frame, and extend both conceptualisations.

all ideas are maps of territory; all maps, abstract representation. map may refer to a process; or resultant state.

2.1 representation

($M \mapsto T$) map as state

A map M, represents territory T:

$$M \mapsto T$$

2.2 interpretation, resolution

($r()$, $M()$) map as process

Territory T, is resolved $r()$ by interpretaion, to a representational account M:

$$r(T) \to M$$

Or for map specific resolution $M()$, of territory T:

$$M(T) \to M$$

2.3 equivalence

($\neq$, $\approx$, $\not\approx$, $\simeq$, $\equiv$, $\therefore$)

Famously, a map M, is not the territory T it represents:

$$M \neq T \ , \ M \approx T \ , \ M \not\approx T$$

However, when sufficiently resolved and circumstantially appropriate, a sufficiently accurate map M, may be momentarily synonymous with the territory T, which it represents:

$$M \simeq T \ , \ M \equiv T$$

In all cases:

$$M \therefore T$$

$\square$

[4] or distinction

[5] note: describe defamiliarisation

3 composition, and family

($M\colon Pa \subset Pr \subset Me$, $T\colon Sp \subset Ph \subset Ch$ *)*

the relative relation of composed, composables: all maps, all territory, are composition

Continuing from section 2, this this section will define the familial composition of maps and respective territory.

Maps M, will be defined:

a paradigm Pa*, is a set of paradigmatic principals* Pr*, each a set of measures* Me

Territory T, will be defined:

a phenomenal scope Sp*, is a set of universal phenomena* Ph*, each a set of phenomenal characteristics* Ch

3.1 composable maps

($M\colon Pa$, Pr , Me *)*

3.1.1 paradigm

($Pa \mapsto Sp$, $Pa(Sp) \rightarrow Pa$ *)*

A paradigm Pa, is a subset $\subset$ of map M:
A paradigm Pa, represents a subset $\subset$ of territory T, referred to as a phenomenal scope Sp:
A paradigm Pa, resolves $r()$ a phenomenal scope Sp, to representational account:

$$Pa(Sp) \rightarrow Pa$$

3.1.2 paradigmatic principal

($Pr \mapsto Ph$, $Pr(Ph) \rightarrow Pr$ *)*

A paradigmatic principal Pr, is a subset $\subset$ of paradigm Pa:

$$Pr \subset Pa$$

A paradigmatic principal Pr, represents a subset $\subset$ of territory T, referred to as a universal phenomena Ph:

$$Pr \mapsto Ph$$

A paradigmatic principal Pr, resolves $r()$ a universal phenomena Ph, to representational account:

$$Pr(Ph) \rightarrow Pr$$

3.1.3 measure

($Me \mapsto \frac{\subset}{T}$, $Me(\frac{\subset}{T}) \rightarrow Me$ *)*

A measure Me, is a subset $\subset$ of paradigmatic principal Pr:

$$Me \subset Pr$$

A measure Me, represents a subset $\subset$ of territory T, referred to as a phenomenal characteristic Ch:

$$Me \mapsto Ch$$

A measure Me , resolves $r()$ a phenomenal characteristic Ch, to representational account:

$$Me(Ch) \rightarrow Me$$

3.1.4 the family of maps

(M: Pa , Pr , Me)

Representation:

$$M \mapsto T\!:\; Pa \mapsto Sp \;,\; Pr \mapsto Ph \;,\; Me \mapsto Ch$$

Subsets:

$$Me \subset Pr \subset Pa \subset M$$

A paradigm Pa, is a set of paradigmatic principals Pr:

$$Pa = \{\ldots\}_{Pr}$$

A paradigmatic principal Pr, is a set of measures Me:

$$Pr = \{\ldots\}_{Me}$$

Composition expression:

$$Pa = \{\{\ldots\}_{Me}, \ldots\}_{Pr}$$

Resolution:

$$r(T) \to M\!:\; ,\; Pa(Sp) \to Pa \;,\; Pr(Ph) \to Pr \;,\; Me(Ch) \to Me$$

3.2 composable territory

(T: Sp , Ph , Ch)

3.2.1 phenomenal scope

(Sp: $Pa \mapsto Sp$, $Pa(Sp) \to Pa$)

A phenomenal scope Sp, is a subset $\subset$ of territory T:

$$Sp \subset T$$

A phenomenal scope Sp, is represented by a paradigm Pa:

$$Pa \mapsto Sp$$

A phenomenal scope Sp, is resolved $r()$ to representational account by a paradigm Pa:

$$Pa(Sp) \to Pa$$

3.2.2 universal phenomena

(Ph: $Pr \mapsto Ph$, $Pr(Ph) \to Pr$)

A universal phenomena Ph, is a subset $\subset$ of territory T:

$$Ph \subset T$$

A universal phenomena Ph, is represented by a paradigmatic principal Pr:

$$Pr \mapsto Ph$$

A universal phenomena Ph, is resolved $r()$ to representational account by a paradigmatic principal Pr:

$$Pr(Ph) \to Pr$$

3.2.3 phenomenal characteristic

(Ch: $Me \mapsto Ch$, $Me(Ch) \to Me$)

A phenomenal characteristic Ch, is a subset $\subset$ of territory T:

$$Ch \subset T$$

A phenomenal characteristic Ch, is represented by a measure Me:

$$Me \mapsto Ch$$

A phenomenal characteristic Ch, is resolved $r()$ to representational account by a measure Me:

$$Me(Ch) \to Me$$

3.2.4 the family of territory

(T: Sp , Ph , Ch)

Representation:

$$M \mapsto T\colon\ Pa \mapsto Sp,\ Pr \mapsto Ph,\ Me \mapsto Ch$$

Subsets:

$$Ch \subset Ph \subset Sp \subset T$$

A universal phenomena Ph , as a set of phenomenal characteristics Ch:

$$Ph = \{\ldots\}_{Ch}$$

A paradigmatic scope Sp , as a set of universal phenomena Ph:

$$Sp = \{\ldots\}_{Ph}$$

Composition expression:

$$Sp = \{\{\ldots\}_{Ch}, \ldots\}_{Ph}$$

Resolution:

$$r(T) \to M\colon\ ,\ Pa(Sp) \to Pa\ ,\ Pr(Ph) \to Pr\ ,\ Me(Ch) \to Me$$

$$\square$$

4 maps

(M) [6]

4.1 set-of-all

($\overset{\cup}{_{Me}}$)

For a paradigm Pa, the set-of-all measures $\overset{\cup}{_{Me}}$, is a union $\cup$, of respective principals Pr:

$$\overset{\cup}{_{Me}} = \{Pa|Pr_1 \cup Pr_2 \ldots\}$$

$$\overset{\cup}{_{Me}} = \bigcup Pa\colon \{Pa| \bigcup_{M \in Pr} Me\}$$

4.2 set-of-common

($\overset{\cap}{_{Me}}$)

For a paradigm Pa, the set-of-common-measures $\overset{\cap}{_{Me}}$, is an intersect $\cap$, of respective principals Pr:

$$\overset{\cap}{_{Me}} = \{Pa|Pr_1 \cap Pr_2 \ldots\}$$

$$\overset{\cap}{_{Me}} = \bigcap Pa\colon \{Pa| \bigcap_{M \in Pr} Me\}$$

4.3 symmetric difference

($\overset{\cap\triangle}{_{Me}}$)

The symmetric difference $\overset{\cap\triangle}{_{Me}}$, is the set-of-all measures $\overset{\cup}{_{Me}}$, minus the set-of-common measures $\overset{\cap}{_{Me}}$:

$$\overset{\cup}{_{Me}} - \overset{\cap}{_{Me}} = \overset{\cap\triangle}{_{Me}}$$

4.4 general special

($\overset{Gc}{_{Me}}$, $\overset{Sc}{_{Me}}$)

territory aligns by the general case; maps ought to

For a paradigm Pa, the set-of-common measures $\overset{\cap}{_{Me}}$, represents the general case ^{Gc}:

$$\overset{\cap}{_{Me}} \equiv \overset{Gc}{_{Me}}$$

For a paradigm Pa, the symmetric difference $\overset{\cap\triangle}{_{Me}}$ represents the special case ^{Sc}:

$$\overset{\cap\triangle}{_{Me}} = \overset{Sc}{_{Me}}$$

[6] all references to paradigm Pa, also apply to an arbitrary set of principals Pr

4.5 common, common

($\overset{\cap\cap}{Me}$ *)*

Initially, we considered each paradigm Pa, a set of measures Me, with common measures the result of intersect $\cap$:

$$\overset{\cap_{1,2}}{Me} = Pa_1 \cap Pa_2 = \{Me_2, Me_3\}$$

Subsequently, we redefined a paradigm Pa, as sets of paradigmatic principals Pr, each a set of measures Me, and observe that each paradigm might be considered either by set-of-all measures $\overset{\cup}{Me}$, or by set-of-common measures $\overset{\cap}{Me}$.

As follows, the common measures between paradigms $Pa_{1,2}$, ought now qualify combination, as necessary:

$$\overset{\cap\cap}{Me} = \bigcap Pa_1 \cap \bigcap Pa_2$$

$$\overset{\cup\cap}{Me} = \bigcup Pa_1 \cap \bigcup Pa_2\ ,\ \overset{\cap\cup}{Me} = \bigcap Pa_1 \cup \bigcap Pa_2\ ,\ \overset{\cup\cup}{Me} = \bigcup Pa_1 \cup \bigcup Pa_2$$

or as intersecting general case: $\overset{\cap Gc}{Me} = \{Pa_1|^{Gc}_{Me}\} \cap \{Pa_2|^{Gc}_{Me}\}$

4.6 complexity

($|\overset{\cap}{Me}| < |\overset{\cup}{Me}|$ *)*

The paradigmatic set-of-common measures $\overset{\cap}{Me}$, is a subset $\subseteq$ of the paradigmatic set-of-all measures $\overset{\cup}{Me}$:

$$\overset{\cap}{Me} \subseteq \overset{\cup}{Me}$$

The paradigmatic set-of-common measures $\overset{\cap}{Me}$, is simpler than the paradigmatic set-of-all measures $\overset{\cup}{Me}$:

$$|\overset{\cap}{Me}| < |\overset{\cup}{Me}|$$

The set of common, common measures $\overset{\cap\cap}{Me}$, between *any* two paradigms Pa, is simpler still:

$$Pa_1 \rightarrow \overset{\cap_1}{Me}\ ,\ Pa_2 \rightarrow \overset{\cap_2}{Me} : |\overset{\cap\cap}{Me}| < |\overset{\cap_1}{Me}|\ \wedge\ |\overset{\cap\cap}{Me}| < |\overset{\cap_2}{Me}|$$

note: ignoring further treatment for time being [7]

4.7 reconciliation

(the set theory principle of inclusion and exclusion)

"the universe does not double count"—conservation laws

The set theory principle of inclusion and exclusion states:

$$|X \cup Y| = |X| + |Y| - |X \cap Y|$$

"for an accurate account, the sum of set cardinals must be subtracted by the cardinal of the common set"

"paradigms which do not reconcile by the general case, double count"

$$X \cap Y \equiv \overset{\cap\cap}{Me} \equiv \overset{\cap Gc}{Me}$$

$\square$

[7] diversity; etc

5 territory

(T)

5.1 set-of-all

($\underset{Ch}{\cup}$)

For any phenomenal scope Sp, the set-of-all phenomenal characteristics $\underset{Ch}{\cup}$ is a union $\cup$, of respective universal phenomena Ph:

$$\underset{Ch}{\cup} = \{Sp|Ph_1 \cup Ph_2 \ldots\}$$

$$\underset{Ch}{\cup} = \{Sp| \bigcup_{Ch \in Ph} Ch\} \ , \bigcup Sp$$

5.2 set-of-common

($\underset{Ch}{\cap}$)

For a phenomenal scope Sp, the set-of-common phenomenal characteristics $\underset{Ch}{\cap}$, is an intersect $\cap$, of respective phenomena Ph:

$$\underset{Ch}{\cap} = \{Sp|Ph_1 \cap Ph_2 \ldots\}$$

$$\underset{Ch}{\cap} = \{Sp| \bigcap_{Ch \in Ph} Ch\} \ , \bigcap Sp$$

5.3 symmetric difference

($\underset{CH}{\cap^{\triangle}}$)

The symmetric difference $\cap^{\triangle}$ *(or common complement $\cap^{\complement}$)*, is the set-of-all characteristics $\underset{Ch}{\cup}$, minus the set-of-common characteristics $\underset{Ch}{\cap}$:

$$\underset{Ch}{\cup} \setminus \underset{Ch}{\cap} = \underset{Ch}{\cap^{\triangle}} \ : \ \underset{Ch}{\cap^{\complement}}$$

5.4 general special

($\underset{Ch}{Gc}$, $\underset{Ch}{Sc}$, $\underset{Ch}{\subset Sc}$)

territory aligns by the general case; maps ought to

For a phenomenal scope Sp, the set-of-common characteristics $\underset{Ch}{\cap}$, represents the general case ^{Gc}:

$$\underset{Ch}{\cap} \equiv \underset{Ch}{Gc}$$

For a phenomenal scope Sp, the symmetric difference $\underset{Ch}{\cap^{\triangle}}$ represents the special case ^{Sc}:

$$\underset{Ch}{\cap^{\triangle}} = \underset{Ch}{Sc}$$

5.5 common, common

($\overset{\cap\cap}{Ch}$)

The common, common characteristics $\overset{\cap\cap}{Ch}$ between phenomenal scopes, $Sp_{1,2}$, ought now qualify combination, as necessary:

$$\overset{\cap\cap}{Ch} = \bigcap Sp_1 \cap \bigcap Sp_2$$

$$\overset{\cup\cap}{Ch} = \bigcup Sp_1 \cap \bigcup Sp_2 \ , \ \overset{\cap\cup}{Ch} = \bigcap Sp_1 \cup \bigcap Sp_2 \ , \ \overset{\cup\cup}{Ch} = \bigcup Sp_1 \cup \bigcup Sp_2$$

$$\textit{or as intersecting general case: } \overset{\cap Gc}{Ch} = \{Sp_1|^{Gc}_{Ch}\} \cap \{Sp_2|^{Gc}_{Ch}\}$$

5.6 complexity

($|\overset{\cap}{Ch}| < |\overset{\cup}{Ch}|$)

The phenomenal scope set-of-common characteristics $\overset{\cap}{Ch}$, is a subset $\subseteq$, of the phenomenal scope set-of-all characteristics $\overset{\cup}{Ch}$:

$$\overset{\cap}{Ch} \subseteq \overset{\cup}{Ch}$$

The phenomenal scope set-of-common characteristics $\overset{\cap}{Ch}$, is simpler than the phenomenal scope set-of-all-characteristics $\overset{\cup}{Ch}$:

$$|\overset{\cap}{Ch}| < |\overset{\cup}{Ch}|$$

The set of common, common characteristics $\overset{\cap\cap}{Ch}$, between *any* two phenomenal scope Sp, is simpler still:

$$Sp_1 \rightarrow \overset{\cap_1}{Ch} \ , \ Sp_2 \rightarrow \overset{\cap_2}{Ch} : |\overset{\cap\cap}{Ch}| < |\overset{\cap_1}{Ch}| \ AND \ |\overset{\cap\cap}{Ch}| < |\overset{\cap_2}{Ch}|$$

note: ignoring further treatment for time being; diversity; etc

5.7 reconciliation

(set theory principle of inclusion and exclusion)

"the universe does not double count"—conservation laws

The set theory principle of inclusion and exclusion states:

$$|X \cup Y| = |X| + |Y| - |X \cap Y|$$

for an accurate account, the sum of set cardinals must be subtracted by the cardinal of the common set

"paradigms which do not reconcile by the general case, double count"

$$X \cap Y \equiv \overset{\cap\cap}{Ch} \equiv \overset{\cap Gc}{Ch}$$

□

6 anomaly

($\not\mapsto$, $\underset{T}{\not\mapsto}$, $\underset{M}{\not\mapsto}$ *)*

unresolved, unresolvable, or insufficiently resolved, territory

6.1 anomaly, generally

($\not\mapsto$ *)*

Anomaly refers to all unnoticed, unrecognised, uninterpreted, undefined, unexplained, unrepresented, and unaccounted, universal phenomena.

Anomaly is all we cannot see: all negative-space, between and beyond the intangible structures, assertions, and definitions, of comprehension, intent, and agency.

6.2 anomalous territory

($\underset{Sp}{\not\mapsto}$, $\underset{Ph}{\not\mapsto}$, $\underset{Ch}{\not\mapsto}$ *)*

any territory for which there is no, or effectively-no, map

$$\underset{T}{\not\mapsto}:\ |M| \approx 0$$

Anomalous territory $\underset{T}{\not\mapsto}$, frames anomaly $\not\mapsto$, by territory T:

$$\underset{T}{\not\mapsto}:\ \underset{Sp}{\not\mapsto}\ ,\ \underset{Ph}{\not\mapsto}\ ,\ \underset{Ch}{\not\mapsto}$$

Further definitions:

$$\underset{T}{\not\mapsto} \approx \not\mapsto$$

$$|\underset{T}{\not\mapsto}| \approx 0$$

$$T \setminus \underset{T}{\not\mapsto} \approx T\ ,\ \underset{T}{\not\mapsto}^{\complement} \approx T$$

$$|T \setminus \underset{T}{\not\mapsto}| \approx |T|\ ,\ |\underset{T}{\not\mapsto}^{\complement}| \approx |T|$$

6.3 anomalous map

($\underset{Pa}{\not\mapsto}$, $\underset{Pr}{\not\mapsto}$, $\underset{M}{\not\mapsto}$ *)*

Anomalous map $\underset{M}{\not\mapsto}$, refers to any map M, which insufficiently resolves $r()$, territory T, to representational account M [8]:

$$|M| \not\approx |T|$$

Further definitions:

$$\underset{M}{\not\mapsto} \not\approx \not\mapsto$$

$$|\underset{M}{\not\mapsto}| \not\approx 0$$

[8] all ununified science is fundamentally anomalous

6.4 reconciling anomaly

($\not\mapsto \setminus \not\mapsto$)

a map is a representational account of territory; however, not all maps resolve territory equally well

$$M \mapsto T \ , \ M \not\equiv T \ , \ M \not\approx T$$

Specifically, where two paradigms Pa, attempt to resolve $r()$ approximately the same phenomenal scope Sp_1, each paradigm may interpret and represent differently [9]:

$$Pa_1(T_1) \to Pa_1 \ , \ Pa_2(T_1) \to Pa_2$$

$$Pa_1 \not\approx Pa_2$$

$$|Pa_1| \not\approx |Pa_2|$$

$$Pa_1 \cap Pa_2 \approx \varnothing$$

$$Pa_1 \neq Pa_2$$

6.5 resolving anomaly

($r(\not\mapsto)$)

prose removed for revision; though primarily a segue to map territory fit/ delta

$\square$

[9] note that T_1 does not change in this example, there is a difference between both maps, and both maps and territory. this difference might be framed using a variety or distinct mathematical forms: set theory (as here); category theory; graph theory; geometry, geometric tessellation, and tiling; etc

7 map territory delta, fit

($MT\Delta$, MTf) delta refers to difference, or required change

a map is a representational account of territory; however, not all maps resolve territory to representational account equally well

$$M \mapsto T \ , \ M \not\equiv T \ , \ M \not\approx T$$

Specifically, where two paradigms Pa, attempt to resolve $r()$ approximately the same phenomenal scope Sp_1, two paradigms $Pa_{1,2}$, may interpret and represent differently:

$$Pa_1(Sp_1) \rightarrow Pa_1 \ , \ Pa_2(Sp_1) \rightarrow Pa_2$$

$$Pa_1 \not\approx Pa_2$$

$$|Pa_1| \not\approx |Pa_2|$$

$$Pa_1 \cap Pa_2 \approx \varnothing$$

$$Pa_1 \neq Pa_2$$

7.1 map territory delta

($MT\Delta$)

the difference between map and respective territory

$$M_T \setminus M = M^{\mathcal{A}\mathsf{C}}$$

7.2 map territory fit

(MTf)

$$\square$$

Part II

exploration

8 resolving the universe

($r(T)$, $\overset{\cap}{T}$, $\overset{\cap}{M}$)

8.1 the universal scope

($\overset{\mathcal{U}}{Sp}$)

A phenomenal scope Sp, contains one or more universal phenomena Ph:

$$Sp = \{\ldots\}_{Ph}$$

The universal scope $\overset{\mathcal{U}}{Sp}$, contains all universal phenomena Ph:

$$\overset{\mathcal{U}}{Sp} = \{\ \forall_{Ph} \in \mathcal{P}(Ph)\ \}$$

8.2 universal commonality: phenomenal characteristics

($\overset{\mathcal{U}\cap}{Ch}$)

The common characteristics $\overset{\cap}{Ch}$, of a phenomenal scope Sp, is expressed:

$$\overset{\cap}{Ch} = \bigcap Sp : \{Sp| \bigcap_{Ch \in Ph} Ch\}$$

The common characteristics $\overset{\cap}{Ch}$, of the universal phenomenal scope $\overset{\mathcal{U}}{Sp}$, might be expressed:

$$\overset{\mathcal{U}\cap}{Ch} = \bigcap \overset{\mathcal{U}}{Sp} : \{\overset{\mathcal{U}}{Sp}| \bigcap_{Ch \in Ph} Ch\}$$

The set of characteristics Ch, common to the universal scope $\overset{\mathcal{U}}{Sp}$, are common to every phenomenal scope Sp, and every universal phenomena Ph, and the simplest expression of commonality across all:

$$\{\forall_{Sp} \in \overset{\mathcal{U}}{Sp}\colon \overset{\mathcal{U}\cap}{Ch} \subset Sp\ ,\ |\overset{\mathcal{U}\cap}{Ch}| < |\bigcap Sp|\}\ ,\ \{\forall_{Ph} \in \overset{\mathcal{U}}{Ph}\colon \overset{\mathcal{U}\cap}{Ch} \subset Ph\ ,\ |\overset{\mathcal{U}\cap}{Ch}| < |Ph|\}$$

The universal set-of-common characteristics $\overset{\mathcal{U}\cap}{Ch}$, is equivalent to the universal general case UGc:

$$\overset{\mathcal{U}\cap}{Ch} \equiv \overset{\mathcal{U}Gc}{Ch}$$

8.3 the universal paradigm

($\overset{\mathcal{U}}{Pa}$)

A paradigm Pa, may contain one or more paradigmatic principals Pr:

$$Pa = \{\ldots\}_{Pr}$$

The universal paradigm $\overset{\mathcal{U}}{Pa}$, contains all principals Pr [10]:

$$\overset{\mathcal{U}}{Pa} = \{\ \forall_{Pr} \in \mathcal{P}(Pr)\ \}$$

[10] or generally: $\overset{\mathcal{U}}{Pa} \equiv \overset{\mathcal{U}}{M}$

8.4 universal commonality: measures

($\overset{\mathcal{U}\cap}{Me}$ *)*

The common measures $\overset{\cap}{Me}$, of a paradigm Pa, is expressed:

$$\overset{\cap}{Me} = \bigcap Pa : \{Pa| \bigcap_{Me \in Pr} Me\}\}$$

The common measures $\overset{\cap}{Me}$, of the universal paradigm $\overset{\mathcal{U}}{Pa}$, might be expressed:

$$\overset{\mathcal{U}\cap}{Me} = \bigcap \overset{\mathcal{U}}{Pa} : \{\overset{\mathcal{U}}{Pa}| \bigcap_{Me \in Pr} Me\}$$

The set of measures $\overset{\cap}{Me}$, common to the universal paradigm $\overset{\mathcal{U}}{Sp}$, are common to every paradigm Pa, and every paradigmatic principal Pr, and represent the simplest expression of commonality across all:

$$\{\forall_{Pa} \in \overset{\mathcal{U}}{Pa}\colon \overset{\mathcal{U}\cap}{Me} \subset Pa \ , \ |\overset{\mathcal{U}\cap}{Me}| < |\bigcap Pa|\} \ , \ \{\forall_{Pr} \in \overset{\mathcal{U}}{Pr}\colon \overset{\mathcal{U}\cap}{Me} \subset Pr \ , \ |\overset{\mathcal{U}\cap}{Me}| < |Pr|\}$$

The universal set-of-common measures $\overset{\mathcal{U}\cap}{Me}$, is equivalent to the universal general case UGc:

$$\overset{\mathcal{U}\cap}{Me} \equiv \overset{\mathcal{U}Gc}{Me}$$

8.5 universal complexity tbc

( )

some problems are more complicated than others, of course, but perhaps, the most difficult problem of all, is recognising that if all universal phenomena are composition, and all problems are decomposable, then all solutions are simply one pattern away

the universal set-of-common measures $\overset{\mathcal{U}}{C_{Me}}$ is a subset of the universal set-of-all measures $\overset{\mathcal{U}}{Me}$:

$$\overset{\mathcal{U}}{C_{Me}} \subset \overset{\mathcal{U}}{Me}$$

and so the universal set-of-common measures $\overset{\mathcal{U}}{C_{Me}}$ is simpler than the universal set-of-all measures $\overset{\mathcal{U}}{Me}$:

$$|\overset{\mathcal{U}}{C_{Me}}| < |\overset{\mathcal{U}}{Me}|$$

so where the universal set-of-all measures $\overset{\mathcal{U}}{Me}$, is the largest set-of-all measures of any paradigm Pa_{Me} :

$$|\overset{\mathcal{U}}{Me}| > |Pa_{Me}|$$

the universal set-of-common measures $\overset{\mathcal{U}}{C_{Me}}$ is the smallest set-of-common measures of any paradigm $Pa_{C_{Me}}$:

$$|\overset{\mathcal{U}}{C_{Me}}| < |Pa_{C_{Me}}|$$

so follows:

$$|\overset{\mathcal{U}}{C_{Me}}| < |Pa_{C_{Me}}| < |Pa_{Me}| < |\overset{\mathcal{U}}{Me}|$$

...

#tbc

...

9 resolving the universe

($r(T)$, ${}^{\cap}_{T}$, ${}^{\cap}_{M}$)

9.1 the universal scope

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A phenomenal scope Sp, contains one or more universal phenomena Ph:

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The universal scope ${}^{\mathcal{U}}_{Sp}$, contains all universal phenomena Ph:

$${}^{\mathcal{U}}_{Sp} = \{\ \forall_{Ph} \in \mathcal{P}(Ph)\ \}$$

9.2 universal commonality: phenomenal characteristics

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The common characteristics ${}^{\cap}_{Ch}$, of a phenomenal scope Sp, is expressed:

$${}^{\cap}_{Ch} = \bigcap Sp : \{Sp| \bigcap_{Ch \in Ph} Ch\}$$

The common characteristics ${}^{\cap}_{Ch}$, of the universal phenomenal scope ${}^{\mathcal{U}}_{Sp}$, might be expressed:

$${}^{\mathcal{U}\cap}_{Ch} = \bigcap {}^{\mathcal{U}}_{Sp} : \{{}^{\mathcal{U}}_{Sp}| \bigcap_{Ch \in Ph} Ch\}$$

The set of characteristics Ch, common to the universal scope ${}^{\mathcal{U}}_{Sp}$, are common to every phenomenal scope Sp, and every universal phenomena Ph, and the simplest expression of commonality across all:

$$\{\forall_{Sp} \in {}^{\mathcal{U}}_{Sp}\!: {}^{\mathcal{U}\cap}_{Ch} \subset Sp\ ,\ |{}^{\mathcal{U}\cap}_{Ch}| < |\bigcap Sp|\}\ ,\ \{\forall_{Ph} \in {}^{\mathcal{U}}_{Ph}\!: {}^{\mathcal{U}\cap}_{Ch} \subset Ph\ ,\ |{}^{\mathcal{U}\cap}_{Ch}| < |Ph|\}$$

The universal set-of-common characteristics ${}^{\mathcal{U}\cap}_{Ch}$, is equivalent to the universal general case UGc:

$${}^{\mathcal{U}\cap}_{Ch} \equiv {}^{\mathcal{U}Gc}_{Ch}$$

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A paradigm Pa, may contain one or more paradigmatic principals Pr:

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The universal paradigm ${}^{\mathcal{U}}_{Pa}$, contains all principals Pr [11]:

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9.4 universal commonality: measures

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The common measures $^{\cap}_{Me}$, of a paradigm Pa, is expressed:

$$^{\cap}_{Me} = \bigcap Pa : \{Pa| \bigcap_{Me \in Pr} Me\}\}$$

The common measures $^{\cap}_{Me}$, of the universal paradigm $^{\mathcal{U}}_{Pa}$, might be expressed:

$$^{\mathcal{U}\cap}_{Me} = \bigcap {}^{\mathcal{U}}_{Pa} : \{^{\mathcal{U}}_{Pa}| \bigcap_{Me \in Pr} Me\}$$

The set of measures $^{\cap}_{Me}$, common to the universal paradigm $^{\mathcal{U}}_{Sp}$, are common to every paradigm Pa, and every paradigmatic principal Pr, and represent the simplest expression of commonality across all:

$$\{\forall_{Pa} \in {}^{\mathcal{U}}_{Pa}\text{: } {}^{\mathcal{U}\cap}_{Me} \subset Pa\ ,\ |^{\mathcal{U}\cap}_{Me}| < |\bigcap Pa|\}\ ,\ \{\forall_{Pr} \in {}^{\mathcal{U}}_{Pr}\text{: } {}^{\mathcal{U}\cap}_{Me} \subset Pr\ ,\ |^{\mathcal{U}\cap}_{Me}| < |Pr|\}$$

The universal set-of-common measures $^{\mathcal{U}\cap}_{Me}$, is equivalent to the universal general case UGc:

$$^{\mathcal{U}\cap}_{Me} \equiv {}^{\mathcal{U}Gc}_{Me}$$

9.5 universal complexity tbc

( )

some problems are more complicated than others, of course, but perhaps, the most difficult problem of all, is recognising that if all universal phenomena are composition, and all problems are decomposable, then all solutions are simply one pattern away

the universal set-of-common measures $^{\mathcal{U}}_{C_{Me}}$ is a subset of the universal set-of-all measures $^{\mathcal{U}}_{Me}$:

$$^{\mathcal{U}}_{C_{Me}} \subset {}^{\mathcal{U}}_{Me}$$

and so the universal set-of-common measures $^{\mathcal{U}}_{C_{Me}}$ is simpler than the universal set-of-all measures $^{\mathcal{U}}_{Me}$:

$$|^{\mathcal{U}}_{C_{Me}}| < |^{\mathcal{U}}_{Me}|$$

so where the universal set-of-all measures $^{\mathcal{U}}_{Me}$, is the largest set-of-all measures of any paradigm Pa_{Me} :

$$|^{\mathcal{U}}_{Me}| > |Pa_{Me}|$$

the universal set-of-common measures $^{\mathcal{U}}_{C_{Me}}$ is the smallest set-of-common measures of any paradigm $Pa_{C_{Me}}$:

$$|^{\mathcal{U}}_{C_{Me}}| < |Pa_{C_{Me}}|$$

so follows:

$$|^{\mathcal{U}}_{C_{Me}}| < |Pa_{C_{Me}}| < |Pa_{Me}| < |^{\mathcal{U}}_{Me}|$$

...

#tbc

...

10 time and change

($\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1}$, P_T , P_T^Δ , ${}^mP_T$)

so, how does time fit into all of this? or rather, how does all of this fit into time?

10.1 a quick sketch of all time

($\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1}$, P_T , P_T^Δ)

Consider the universal set-of-all territory $\mathcal{U}_T$ over time $\rightarrow^t$:

$$\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1} \ : \ \mathcal{U}_T^{t0} \neq \mathcal{U}_T^{t1}$$

time implicates change

Consider observing the universal set-of-all territory $\mathcal{U}_{Ph}$, while a new universal phenomena Δ, is formed:

$$\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1} \ : \ \Delta \notin \mathcal{U}_T^{t0} \ , \ \Delta \in \mathcal{U}_T^{t1}$$

Specifically:

$$\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1} : \mathcal{U}_T^{t1} = \mathcal{U}_T^{t0} + \Delta$$

And another:

$$\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1} \rightarrow^t \mathcal{U}_T^{t2} : \mathcal{U}_T^{t2} = \mathcal{U}_T^{t1} + \Delta$$

Such that generally:

$$|\mathcal{U}_T^{t0}| < |\mathcal{U}_T^{t1}| < |\mathcal{U}_T^{t2}| \ldots$$

note: conservation laws, plus more is different

10.2 prior circumstances

(P_T , P_T^Δ)

considering universal phenomena Ph, by the circumstances in which they arose will prove useful

At any time marked by the arrival of phenomenal change Δ, relative to the universal set-of-all territory $\mathcal{U}_T$, at $t1$, there existed a prior moment, and a prior state of territory P_T, whereby Δ, did not yet exist:

$$P_T \rightarrow^t \mathcal{U}_T^{t1} \ : \ \mathcal{U}_T^{t1} = P_T + \Delta \ : \ \Delta \notin P_T$$

prior circumstances P_T, provides a useful reference frame to easily refer to universal circumstances, just prior to some occasion

Further, we might observe that circumstances prior to the arrival of Δ, are equivalent to the universal complement of Δ, having arrived:

$$\mathcal{U}_T^{t1} = P_T + \Delta$$

$$\mathcal{U}_T^{t1} \setminus \Delta = \Delta^{\complement} \equiv P_T$$

And our reference to prior circumstances P_T, might now also reference the potential for specific change Δ:

$$P_T^\Delta$$

For example:

$$P_T^\Delta \rightarrow^t \mathcal{U}_T \ : \ \mathcal{U}_T = P_T + \Delta$$

but why? let us find out [12]

[12] requisite potential for T

10.3 composition over time

($\to^t \Delta$)

simplified composition

10.3.1 part one

( )

Let us consider a simple pattern:

$$\mathcal{U}_T^{ti} \to^t \mathcal{U}_T^{ti+1} : \mathcal{U}_T^{ti+1} = \mathcal{U}_T^{ti} + \Delta^{ti+1}$$

Such that the following:

$$\mathcal{U}_T^{t0} \to^t \mathcal{U}_T^{t1} \to^t \mathcal{U}_T^{t2} \to^t \mathcal{U}_T^{t3} \dots$$

Will result in:

$$\mathcal{U}_T^{t3} = \mathcal{U}_T^{t0} + \Delta^{t1} + \Delta^{t2} + \Delta^{t3}$$

And each phenomena composed such that:

$$\Delta^{t1} = \{\exists x : x \in \mathcal{U}_T^{t0}\}$$

$$\Delta^{t2} = \{\exists x : x \in [\mathcal{U}_T^{t0} + \Delta^{t1}]\} \;:\; \Delta^{t1} \in \Delta^{t2}$$

$$\Delta^{t3} = \{\exists x : x \in [\mathcal{U}_T^{t0} + \Delta^{t1} + \Delta^{t2}]\} \;:\; [\Delta^{t1}, \Delta^{t2}] \in \Delta^{t3}$$

10.4 ancestral relation

( )

We might observe that universal phenomena Δ^{t1} , Δ^{t2} , and Δ^{t3} , are composed in a similar manner

Each are composed of, and dependant upon, specific prior universal phenomena, such that, Δ^{t2} , could not exist until after Δ^{t1} , and Δ^{t3} could not exist until after Δ^{t2}

We might consider Δ^{t1}, to be a phenomenal ancestor of Δ^{t2} , just as both Δ^{t1}, and Δ^{t2}, appear to be ancestors of Δ^{t3}

We might also consider that Δ^{t2}, and Δ^{t3}, are descendants of Δ^{t1}, just as Δ^{t3}, is a descendant of Δ^{t2}

10.5 composition

( )

more is different

Now consider the occasion of $t4$, and Δ^{t4} :

$$\dots \mathcal{U}_T^{t2} \to^t \mathcal{U}_T^{t3} \to^t \mathcal{U}_T^{t4} \dots$$

Whereby:

$$\mathcal{U}_T^{t4} = \mathcal{U}_T^{t0} + \Delta^{t1} + \Delta^{t2} + \Delta^{t3} + \Delta^{t4}$$

$$\Delta^{t4} = \{\exists x : x \in [\mathcal{U}_T^{t0} + \Delta^{t1} + \Delta^{t2}] : [\Delta^{t1}, \Delta^{t2}] \in \Delta^{t4}$$

And remember:

$$\Delta^{t3} = \{\exists x : x \in [\mathcal{U}_T^{t0} + \Delta^{t1} + \Delta^{t2}] : [\Delta^{t1}, \Delta^{t2}] \in \Delta^{t3}$$

And:

$$\Delta^{t3} \neq \Delta^{t4}$$

tbc explain distinct constraint earlier

In this case, Δ^{t4}, shares identical dependencies as Δ^{t3}, such that Δ^{t4}, is not a descendant of Δ^{t3}; and Δ^{t3}, is not an ancestor of Δ^{t4}

And so we might observe:

1. that on some occasions, the absolute universal order in which some universal phenomena appear, is less constrained. for example:

Let us identify our universal phenomena A, B, C, D , and consider $t4$, where Δ_C , appears at $t3$, and Δ_D , appears at $t4$:

$$\mathcal{U}_T^{t4} = \mathcal{U}_T^{t0} + \Delta_A^{t1} + \Delta_B^{t2} + \Delta_C^{t3} + \Delta_D^{t4}$$

It was at least materially possible, under some other universal circumstance, whereby Δ_D , appeared at $t3$, and Δ_C , appeared at $t4$:

$$\mathcal{U}_T^{t4} = \mathcal{U}_T^{t0} + \Delta_A^{t1} + \Delta_B^{t2} + \Delta_D^{t3} + \Delta_C^{t4}$$

2. in the case of Δ^{t3}, and Δ^{t4}, having identical compositional dependencies (elements from $[U_T^{t0} + \Delta^{t1} + \Delta^{t2}]$), yet $\Delta^{t3} \neq \Delta^{t4}$, each phenomena must qualify the difference in some manner not yet represented here [13]

10.6 time independent circumstances

(P_T^{Δ} , ${}^mP_T$)

time independent circumstances refers to the general potential for specific phenomenal composition, without the need to present a sequence of tx

10.7 general potential

(P_T^{Δ})

To refer to the circumstances prior to, and as a set-of-all-requisite phenomena necessary for, the composition of any specific universal phenomena Δ:

$$P_T^{\Delta}$$

Using our above sequence $t0 \to 4$: $P_T^{\Delta t3}$, would thereby be indirectly referring to $\mathcal{U}_T^{t2}$ only, whereby $P_T^{\Delta t4}$, would be indirectly referring to $\mathcal{U}_T^{t2} \to \mathcal{U}_T^{t3}$

further, P_T^{Δ} , is ambiguous about exactly which additional phenomena are included in the set – those additional to the minimal viable set of requisite composition

P_T^{Δ} is a phenomenal scope, and identification might be considered a predictor of Δ.

Considering universal phenomena Ph , by the circumstances in which they arose is useful, and patterns between the prior circumstances of seemingly very distinct phenomena can be instructive as to relative progression

[13] more is different

10.8 minimum viable potential

($^{m}P_T$ *)*

minimum viable material potential

Our reference to prior circumstances P_T, might now also reference the potential for specific change Δ: Focus on tx , and absolute sequence is one aspect for consideration

potential, minimal viable priors, the scope of what must precede

$\square$

11 universal composition

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We have briefly considered the progression of time t, on the composition universal set-of-all territory $\mathcal{U}_T$:

$$\mathcal{U}_T^{t0} \rightarrow^t \mathcal{U}_T^{t1} \dots$$

Let us consider the composition of territory, with a little more detail

11.1 minimal viable prior

($^{\Updownarrow}P_T$)

#tbc

□

12 alignment

*(*)*

12.1 introduction

*(*)*

12.2 maps of territory

(≡)

12.3 biological maps

( )

we live by maps: maps are the nature of knowing

12.4 the territory of maps

( )

12.5 nexus phenomena

( )

12.6 reason, logic, mathematics, mechanics

( )

□

13 complexity

( )

from complexity of open problem-solution space, to closed puzzle-space

13.1 introduction

($\top$)

13.1.1 true complexity

( )

$\square$

14 puzzle-space

(a , b , c)

$$\ldots$$

$$\square$$

15 tessellation

( )

$$\cdots$$

$$\square$$

16 the simplest explanation

(a, b, c)

$$\ldots$$

$\square$

17 the elementary case

(a, b, c)

$$\dots$$

$\square$

Part III
more

18 evolution

(Δ)

18.1 introduction

(Δ)

a simple primer

we evolved: maps evolved; and long before and long after, territory evolves

18.2 surviving territiry

( )

18.2.1 enaction

($\delta_T()$, $\delta_M()$)

18.3 the paradox

( )

□

19 fabric

($\mathcal{T}$ *,* $\mathcal{T}_T$ *,* $\mathcal{T}_M$ *,* $\mathcal{T}_M \mapsto \mathcal{T}_T$ *)*

$\mathcal{T}$ *is the symbol for topology, and T represents territory, so topological territory seems apt, at this time*

the term fabric: will simplify arbitrarily many phenomena to an implied, materially common substrate of abstract space; a nexus phenomena, with which to reason between otherwise distinct, though materially related, phenomena

19.1 introduction

( )

19.2 evolution

( )

19.3 paradigmatic fabric

( )

□

20 nexus

( )

$$\cdots$$

$$\square$$

21 conclusion

(a, b, c)

$$\dots$$

$$\square$$