The Reasoner

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Contents

§1 Editorial

The Reasoner has been around for over a year now and is getting quite a following. There are around 500 regular subscribers and each issue of Volume 1 has had 1500 downloads on average. To all these readers: please consider submitting pieces. We welcome submissions concerning any topic connected to reasoning, inference and method broadly construed. Please also send us letters, listings and items of news. Features get reviewed quickly—decisions are normally made within a fortnight—and any text sent to us by 15th of the month usually appears in the next month's issue.

Thanks to all those who have contributed so far—you've not only produced interesting reading, you've helped develop the mouthpiece of the reasoning community. I'm also very grateful to our speedy reviewers and to our editorial board for all their hard work. Regarding the editorial board, we are very pleased to welcome Federica Russo back as assistant editor: she will no doubt keep things running smoothly.

This month I've interviewed someone who helped get me interested in reasoning during my undergraduate studies. Manchester is a great place to study reasoning with a thriving logic group in one of the largest mathematics departments in the UK ...

Jon Williamson
Philosophy, Kent

§2 Features

Interview with Jeff Paris

Jeff Paris is professor of logic in the Uncertain Reasoning Group in the School of Mathematics at the University of Manchester; the Uncertain Reasoning Group is a member of the Reasoning Club. Jeff is the author of The Uncertain Reasoner's Companion (Cambridge 1994). The Paris–Harrington theorem is well known to students of mathematical logic.

Jon Williamson: Could you fill the readers in on your intellectual history—what you've worked on and why?

Jeff Paris: I did my Ph.D. in the late 1960's in set theory, largely on the recommendation of Mike Yates and because I'd always wanted to get to the bottom of things (which was also why I chose Mathematics in the first place). Those were exciting times in set theory with forcing, large cardinals and determinacy all in their infancy.

After that I became excited about the idea of nonstandard models of arithmetic, and the possibility of proving independence results there just as forcing had enabled us to do in set theory. Indeed my work there started by considering certain analogues of large cardinal axioms within arithmetic.

Over the next 10 years my interests moved more towards fragments of arithmetic, spurred I suppose by the connections between this area and the emerging central problems in computational complexity.

Then, somewhere in the mid 1980's, I became fascinated by the idea of expert systems and an early, not very serious, attempt to build one with a colleague got me involved in the whole question of what it means to reason intelligently, or rationally, with uncertain information. I've been there ever since.

What I particularly like about this research is its ability to surprise. One writes down principles that look entirely rational and common sense and then mathematics takes over and drives you to a conclusion which seems anything but. If you want your research to just confirm what you already thought don't work here.

JW: Could you explain what inductive logic is and the approach you take to the subject? What do you think are the key remaining questions?

JP: The *Problem of Induction* is how, or even more basically why, events in the past should influence our beliefs about the future. Inductive logic is broadly the attempt to answer this question by appealing to purely logical or rational considerations. More specifically, for me, this boils down to the one simply question: Given a predicate language L what belief, as subjective probability, should one rationally assign to the sentences of L in the absence of any further knowledge?

I am not expecting there to be any definitive answer here, rather we investigate the consequences and relationships between various formalizations of 'rational assignment', usually expressed as principles constraining the structure of the assigning probability function, constraints intended to capture our intuitions about 'rationality'. In this sense the subject is very similar to set theory where we postulate various axioms, again motivated by our vague intuitions concerning the nature of the set theoretic universe, and investigate their consequences for this imagined universe.

To date most of the proposed rational principles have involved appeals to symmetry, that the assigning process should respect certain symmetry in the language. I do not think we understand even this notion particularly well but there are two other concepts which appear significant here, relevance and irrelevance, which are even far less well understood.

Additionally, in almost all cases until quite recently this question had only been considered in the case where the language L contained only unary predicates. Beyond the purely unary many new features and complications appear, we have hardly begun to scratch the surface of the main question in that more general setting.

JW: To what extent do you think those studying reasoning and inference need to be aware of what is going on in other disciplines?

JP: One can hardly argue, except perhaps on grounds of time pressure, that knowing what is going on in other disciplines can actually do any harm. However in terms of expecting some some sort of positive return for one's efforts the only area that comes to my mind, apart of course from philosophy, is what's commonly referred to as social choice theory.

On several occasions, and I'm not alone in this, I have later discovered that apparently new ideas in my subject had already been considered, in slightly different clothing maybe, in social choice theory. This is a large and well developed area which has been around for a long time, no doubt there are other ideas there that we could usefully import.

By comparison I have been disappointed by how little my (entirely theoretical) work has gained from contact with practical 'intelligent computing', the applied side of reasoning. On reflection I do not find this at all surprising however: we have different agendas. In particular I am interested in an idealized rational agent totally unperturbed by issues of computational tractability.

JW: In your view what are the most exciting and important research directions in the area of reasoning and inference? What topics would you recommend to graduate students starting out today?

JP: Well, I'll limit my reply to my own area.

If I was taking on a research student right now I would suggest to him/her that s/he investigates the relation of relevance/irrelevance, when and why is knowledge of θ relevant to the belief we assign to some other sentence ϕ and what are the consequences of the various answers we might propose to this question. I think this is an area which promises to unsettle our intuitions.

A second area where much remains to be understood is, as I already mentioned, polyadic inductive logic. I would recommend it to a student but I would also issue a warning. Namely the difficulties s/he would face in terms of the technical demands of the topic and one's much less well formed intuitions on which to base rationality principles would threaten to isolate the study from the philosophy community, where in the past there has been a very fruitful mutual exchange of ideas and encouragement (and criticism!).

JW: You are a member of the Uncertain Reasoning Group at Manchester. What's the group working on, and what is Manchester like as a place to study reasoning?

JP: Right now there are seven of us with my colleagues Alena Vencovská and George Wilmers and research students Jürgen Landes, David Picado-Muiño, Richard Simmonds and Soroush Rafiee Rad. George is now mainly working on voting theory. I'm working with Alena and Jürgen on polyadic inductive logic, with David on probability logic as a paraconsistent logic, with Richard on a proof theory for the probabilistic consequence relation O of David Makinson and Jim Hawthorne, and finally with Soroush on predicate uncertain reasoning. In the recent past my student Peter Waterhouse successfully submitted his Ph.D. thesis on relevance in unary inductive logic and I continue with that too—when there's time!

Right now we are rather a unique group, logicians in a mathematics school working on uncertain reasoning, so for people who like that sort of thing this is the sort of place they will like.

The Admissibility of Evidence about Previous Convictions in Court II: The Rationale for Exclusion

In *The Reasoner* 2(5), I presented the problem of previous convictions. The challenge was to identify the source of the intuitive objection to the use of previous convictions in court and to evaluate whether or not this objection is justified. Objections to this evidence by claiming that it is irrelevant or unspecific were both found to be untenable. A more promising direction was found in Wasserman's argument, according to which evidence of previous convictions fails to respect the accused as an autonomous individual who can 'alter his conduct at each moment' (David Wasserman 1992: 'The Morality of Statistical Proof and the Risk of Mistaken Liability' *Cardozo Law Review* 943). Whilst this direction is promising, an explanation is still required about how previous convictions fail to respect the individual's autonomy.

It is suggested here that one's approach to previous convictions is derived from one's general theory of culpability. In rough lines, two main traditions can be identified amongst theories of culpability: choice and character (for a good introduction to these traditions, see Michael Moore (1990: 'Choice, Character, and Excuse' in Ellen Frankel-Paul, ed., *Crime, Culpability, and Remedy*, Blackwell). The Greek tradition (most notably the Aristotelian tradition) attaches culpability to the individual's character rather than to his specific action (this tradition was brought back to the fore by Bernard Williams, in his critique of the Kantian tradition's neglect of the character, see for example Bernard Williams (1981: 'Persons, Character and Morality' in *Moral Luck*, CUP). The Greek tradition is concerned with how the individual could achieve virtue and avoid vice. Although the individual's actions may be taken into account, the culpability judgment is *holistic* in nature and aims to evaluate the individual's character *as a whole*. In contrast, the Kantian tradition is occupied with evaluating a particular action and questioning whether the individual's *choice* to act as he did was right or wrong (for a good critical description of the Kantian's focus on the action see Williams; for a more sympathetic approach, see Moore). Whilst condemnation of the individual's choice might reflect upon his character, the evaluation is focused on the *particular action* of the individual rather than his character as a whole. Some hybrid positions exist too, such as Simester's suggestion that culpability is based on a combination of character and choice, (Andrew Simester 2000: 'Can Negligence be Culpable?' in J. Horder, ed., *Oxford Essays in Jurisprudence: Fourth Series*, OUP, 88).

It is suggested here that one's position towards the admissibility of previous convictions derives from one's general conception of culpability. If one follows the Greek tradition and holds that culpability should be attributed to the individual's *character*, then it is difficult to object to using evidence about the individual's past misconduct when determining his culpability. The reason is that inferences from such evidence serve to evaluate the individual's character by examining him as a whole, including *all* of his actions. If the target of the culpability judgment is to evaluate the individual as a whole, then evidence about previous convictions could assist significantly as it gives a more detailed and continuous picture about that individual. Therefore, under character theories of culpability, evidence of previous convictions is not objectionable (notably, adapting our contemporary legal system to a full blown character theory requires much more than admitting previous conviction: a full-blown character theory would prescribe an extensive reform of our substantive criminal law, which currently focuses on what you did rather than who you are).

By contrast, if one follows the Kantian tradition and adopts a choice theory of culpability, then there is a clear objection to the admission of previous convictions. According to this conception of culpability, the purpose of the culpability judgment is to evaluate the individual's *choice* to act in the specific circumstances rather than evaluating his entire character. This conception of culpability is based on the assumption that individuals have the capacity to choose their course of conduct regardless of how they chose in the past. Wasserman's objection to previous convictions is better understood when his commitment to a particular type of culpability theory is acknowledged (Wasserman's paper contains several statements which indicate his commitment to a choice theory of culpability, see pp. 943, 952–953). If one adopts a choice theory of culpability, one would object to inferring an individual's misconduct from his past misconduct. The reason is that this undermines the assumption that individuals can determine their conduct freely on each occasion. Therefore, under a choice theory of culpability, evidence of previous convictions is objectionable.

So how does the observation about different types of culpability theories contribute to the debate about previous convictions? It highlights that this debate is not merely about the epistemic qualities of the evidence itself and its ability to assist the fact-finder to ascertain the truth. Rather, the admission of previous convictions as evidence in court depends upon more fundamental moral questions. In particular, it depends on one's general theory of culpability. This dependency identifies the source of the intuitive objection to previous convictions that some have by connecting this objection in a particular type of culpability theory (choice theory). By the same token, it explains why that intuition is not shared by everyone, especially by those who tend to regard culpability as something more holistic. This observation might help making the debate about previous convictions evidence more transparent. That which should dictate the legal approach toward previous convictions evidence should not be merely the qualities of the evidence itself. It should be an acknowledged choice of whichever theory of culpability we want our law to reflect.

Amit Pundik
Law, Cambridge

Yet Another Problem for Reichenbachian Approaches to the Semantic Analysis of Indexical Languages

Introduction

Reichenbachian approaches (to the semantic analysis of indexical languages) are characterized by ascribing the fundamental semantic properties, truth-conditions and reference, to (sentence) tokens instead of to (sentence) types' (Manuel García-Carpintero, 1998: "Indexicals as Token-Reflexives", *Mind*, 427, p. 529.). As of today, the most effective objections to Reichenbachian approaches have pointed, respectively, to a problem of *overgeneration* and *undergeneration* with respect to logical truth. Logical truth is defined, according to the type-oriented theories, as follows:

(1) A sentence-type S is logically true iff it is true with respect to any context c.

The obvious rephrasing in the token-reflexive jargon would be something along the following lines:

(2) A sentence-type S is logically true iff all tokens t of S are true.

The general structure of the arguments against token-reflexive theories (henceforth: 'TR-theories') can be set out as follows:

i. According to the token-reflexive approaches, S is/is not a logical truth

ii. According to our semantic intuitions, S is not/is a logical truth

iii. Token-reflexive approaches overgenerate/undergenerate with respect to logical truth [i-ii]

iv. Token-reflexive theories are inadequate semantic theories [iii]

So, for instance, following a famous remark of David Kaplan (1989: *Afterthoughts*, p. 584, In: J. Almog, J. Perry, H. Wettstein, eds, *Themes from Kaplan*, OUP) it can be pointed out that the intuitively valid:

(3) I am sitting now if, and only if, I am sitting now.

can have false tokens (a sufficiently slow utterance) and therefore turns out to be invalid according to a TR-theory. In the same vein, Stefano Predelli (2005: *Contexts*, OUP, p. 98) has argued that the intuitively invalid:

(4) Either a token exists now, or it has existed in the past, or will exist in the future.

would turn out valid, since it cannot be tokened falsely.

Appealing as these arguments may appear, their reliance on competent speakers' semantic intuitions bears on their ultimate efficacy against TR-theories. As a matter of fact, it is always open to the TR-theorist to question the existence (or the value) of such intuitions when certain sentence-types are at stake (See, for instance, García-Carpintero, 1998).

The aim of this paper is to provide an argument against TR-theories that doesn't rely on our semantic intuitions about specific sentence-types, but instead on the validity of the principle customarily called *Conditional Proof*, according to which:

(CP) If a sentence-type Q is a logical consequence of a sentence-type P, then the sentence-type 'If P, then Q' is a logical truth.

I will argue that since this classically valid rule of inference fails in the case of TR-theories, those should be rejected.

Tokens and logical consequence

Logical consequence may be presented in the type-oriented jargon, as follows:

(5) A sentence-type Q is a logical consequence of a sentence-type P iff, for every context c, if P is true with respect to c, then Q is true with respect to c.

A natural way to rephrase (5) along the token-oriented attitude featuring in (2) appears to be the following

(6) A sentence-type Q is a logical consequence of a sentence-type P iff, for every context c and token t, if t is a true token of P occurring in c, then any token t' of Q occurring in c is true.

Notice that (6) is equivalent to

(7) A sentence-type Q is a logical consequence of a sentence-type P iff, there is no context c, token t and token t', such that t is a true token of P occurring in c and t' is a false token of Q occurring in c.

Consider now the following sentence:

(8) There exists only one sentence-token.

The following argument proves that every sentence s is a logical consequence of (8):

a. T is a token of (8) occurring in C

b. T is true

c. There exists only one sentence-token in C [b]

d. T is the only sentence-token existing in C [a,c]

e. For any sentence s, there exists no false token of s in C [b,d]

f. For any context c and sentence s, if there is a true token of (8) occurring in c, then no false token s occurs in c [a,e]

g. For any context c and sentence s, there is no token t and token t', such that t is a true token of (8) occurring in c and t is a false token of s occurring in c [f]

h. For any sentence s, s is a logical consequence of (8) [g,(7)]

Consider then the sentence

(9) There exists more than one sentence-token.

According to (7) , (8) logically entails (9) ; however, the sentence

(10) If there exists only one sentence-token, then there exists more than one sentence-token.

is not a logical truth: in a context in which a token t of (10) is the only existing sentence-token, t is false. We have therefore a counterexample to *Conditional Proof*: the sentence-type 'There exists more than one sentence-token' is a logical consequence of the sentence-type 'There exists only one sentence-token', but the sentence-type 'If there exists only one sentence-token, than there exists more than one sentence-token' is not a logical truth.

I conclude, therefore, that since *Conditional Proof* 'play[s] a vital role in systems of natural deduction, the formal systems closest to our informal deductions' (Timothy Williamson, 1994: *Vagueness*, Routledge, p.152), TR-theories must be rejected as invalidating 'our natural mode of deductive thinking' (Williamson, p. 152).

Roberto Loss
Philosophy, Nottingham

A process oriented externalist solution to the hard problem

See cartoons at the end of this issue.

Riccardo Manzotti
Psychology, IULM University of Milan

§3
News

Theoretical frameworks and empirical underdetermination, 10–12 April

Between 10–12 April some of the world's leading experts in the scientific realism debate congregated at the Theoretical Frameworks and Empirical Underdetermination workshop which was hosted at the University of Düsseldorf.

One of the main topics discussed was that of the relationship between scientific realism and theories of reference. In his talk, David Papineau argued that realists need not to worry about referential continuity between successive theories because a scientific theory's cognitive significance is captured by its Ramsey-sentence and the latter makes theoretical term reference irrelevant. Similarly antagonistic to standard referential semantics were John Worrall and James Ladyman. The latter reasoned that the phlogiston theory of combustion supports ontic structural realism (OSR) for it satisfies three of its demands: (a) that the empirical success of a theory must be preserved in subsequent theories, (b) that a theory's central terms cannot plausibly be said to refer to anything and (c) that our knowledge does not extend to the intrinsic natures of unobservable individual objects. The former defended the Ramsey-sentence approach to epistemic structural realism against arguments from underdetermination. Among other things, Worrall rejected term-by-term correspondence in favour of the global correspondence between the mathematical structure of a theory and the world. Ioannis Votsis and Gerhard Schurz took a more positive stance towards standard referential semantics. Votsis argued that if we want to save all of our conflicting intuitions regarding the concept of reference we have to reject the idea that it is a monolithic concept. With this aim in mind, he sketched a hierarchy of concepts of reference, each satisfying different sets of intuitions. Schurz proved a correspondence theorem that allows one to adopt a relatively weak form of realism. The theorem establishes that even if two successive and empirically successful theories have different theoretical superstructures, they can still referentially correspond to one another with respect to a given domain of phenomena via bilateral reduction sentences.

Another topic central to the discussion was underdetermination. Paul Hoyningen-Huene employed measure theory to formalise a version of the underdetermination argument that he calls 'transient underdetermination'. He then contended that provided transient underdetermination holds, the no miracles argument is unsound. Far from considering underdetermination to be a threat to realism, Martin Carrier reasoned that it serves an important function in epistemology by making perspicuous the role of non-empirical virtues in theory choice. Three other speakers related issues of underdetermination to OSR. F.A. Muller argued that similar elementary particles in quantum mechanics are demonstrably weak discernibles but not individuals. Their weak discernibility, according to him, illustrates the underdetermination of metaphysical views by physical theories, for it is unclear whether it supports or undermines OSR. Their non-individuality, Muller holds, illustrates the determination of physical theories by metaphysical views since it rules out an ontology based on individuals. Discussing issues of mathematical overdetermination, among other things, Holger Lyre drew attention to the difficulty in distinguishing surplus mathematical structure from the relevant physical structure in a non-circular way. He argued that OSR needs to solve this problem as well as take into account the claim that objects have structurally derived intrinsic properties. In Lyre's view, this claim can be successfully accounted for by his own version of non-eliminativism OSR, namely 'Intermediate SR'. Steven French motivated the view that the best way to tackle certain versions of the underdetermination problem is to adopt an ontic structural realist approach that focuses on the essential structure of a theory. He then went on to identify this structure as consisting not merely of the object structure revealed in the invariants of relevant groups but also of the dynamical structure encoded in spaces that carry representations of groups.

The remaining talks represented a medley of topics. Stathis Psillos offered empiricists a way to embrace the scientific realism framework. He argued that adoption of this framework cannot be made on evidential considerations or by access to a theory-free vantage point of reality. Rather, it can only be made by realising its indispensability in giving us a causally and nomologically coherent view of the world. Ludwig Fahrbach defended realism against the pessimistic meta-induction, arguing that Laudan's list of successful but refuted theories enjoyed low degrees of success. Since the growth of success is exponential according to Fahrbach the greatest boost in success has occurred in the last few decades. Our current theories enjoy these very high degrees of success and contrary to Laudan have not been refuted. Hannes Leitgeb reconstructed the notion of empirical content in structuralist terms, showing how the empirical content of scientific expressions can be exhaustively specified by means of terms that are either logico-mathematical or that refer directly to experience. Michael Friedman, who delivered the plenary talk, acknowledged the similarities between Carnap's structuralism and modern discussions of structural realism but reasoned that the former is solely concerned with explicating the semantics of theoretical terms and therefore remains neutral in the realism debate.

Ioannis Votsis
Philosophy, Heinrich-Heine-Universität Düsseldorf

Reduction and the Special Sciences, 10–12 April

The first Sydney-Tilburg Conference was held 10–12 April, this time in Tilburg and on the topic of "Reduction and the Special Sciences". To view the program details, go to www.tilburguniversity.nl/faculties/humanities/tilps/RSS2008/. Thanks to all participants for their various contributions and for creating a lively conference.

As the title of the conference suggests, papers introducing case studies from the special sciences to illuminate debates on reduction versus pluralism were especially encouraged, in addition to papers from a more general metaphysics/philosophy of science perspective. And indeed, a number of the special sciences were represented at the conference, not least amongst the talks from invited speakers: William Bechtel and Paul Griffiths argued in favour of explanatory pluralism, whether within biology (how biological parts relate to whole biological mechanisms or systems) or in relating biological explanation to physical/chemical explanation of the same (biological) phenomena. Kevin Hoover criticised a dominant movement in economics to reduce (or simply convert) standard macroeconomic models to models that employ microeconomic terms. These pluralistic attitudes towards scientific theory and explanation were echoed by a number of others who spoke on the special sciences.

With respect to the ontology of the special sciences, let alone their explanatory merits, a number of speakers came down on the pluralist side of the debate. For instance, Frank Hindriks and Brian Epstein were in favour of non-reductive ontology in the social sciences. The latter argued that macro-economic properties in economics do not supervene on what are typically taken to be micro-economic properties. On the neuroscience front, however, there was some support for ontological reduction: Markus Werning proposed that for physicalism to be true, the logical structure of thought must be necessitated by the topological organisation of information in the cortex; he went on to show via computer simulation that this may indeed be the case.

Both Jos Uffink and Wolfgang Pietsch (who was awarded 'best graduate paper') considered reductive accounts within physics. The former discussed how the Gibbs paradox problematises the project of reducing thermodynamics to classical physics—the paradox is that there is an ad hoc aspect of the classical microphysical account which begs for further quantum theoretic explanation. Pietsch examined the possibility of reduction without hierarchy between theories; he argued that there are cases (e.g., electrodynamics and electromagnetic field theory) in which both theories can be 'reduced' to each other and yet each has a distinct explanatory role.

Others approached the question of reductive hierarchies from a more general perspective. Craig Callender, one of the invited speakers, outlined a 'relative best systems' account of laws (i.e., that best systems are relative to a particular ontology) to argue for pluralism about the kinds of laws governing phenomena. Using the exchange between Robert Batterman and Gordon Belot and the discussion about New Wave Reductionism as examples, Sebastian Lutz argued that the theory of definition can clarify reduction debates.

There was also a cluster of contributions on physicalism and Kim's causal exclusion argument. Cynthia and Graham MacDonald sifted through the various conceptualisations of emergence in mind, and developed the metaphysics underlying their preferred version in order to counter some well-known challenges to this account. Others adopted a more open attitude to dualism: Menzies and List set out to test the exclusion principle in terms of a difference-making account of causation, and derived necessary and sufficient conditions (which may or may not hold in the actual world) for the principle to be true. In the final session of the conference, invited speaker Philip Pettit considered thought experiments designed to test physicalism, and explored reasons why our reductive intuitions are inherently limited.

The above-mentioned papers are only a sample of the conference content. And please watch out for notices announcing the 2nd Sydney-Tilburg conference, to be held in Sydney in 2009.

Katie Steele
Philosophy, Sydney

Fifth International Workshop on Argumentation in Multi-Agent Systems (ArgMAS 2008), 12 May

In recent years, argumentation gained increasing importance in artificial intelligence (AI) as a means for formalising and automating reasoning with incomplete and uncertain information. More recently, this has extended to research on multi-agent systems (MAS): computer systems comprising intelligent, autonomous, interacting pieces of software.

In 2004, a group of researchers established a series of workshops on Argumentation in Multi-Agent Systems (ArgMAS). The workshop ran annually alongside the International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS). This has resulted in four volumes published by Springer in their Lecture Notes in Artificial Intelligence series (volumes 3366, 4049, 4766, 4946).

In its fifth instalment, ArgMAS 2008 was held on May 12 in Estoril, Portugal, alongside AAMAS. The first talk, by Atkinson et al., described a new representation of imperatives in computational systems, together with a formal protocol for enabling "command dialogues" in MAS. Next, Oliva et al. presented a framework for mediated argumentation in MAS coordinated dialogue. The third paper, by Modgil and Luck, presented an argumentation-based model for reasoning about conflicts between desires and normative goals.

In the second session, Atkinson and Bench-Capon presented an argument-based model of practical reasoning which takes into account the ways in which social laws can help achieve an action, the form the social laws should take, and the likelihood of compliance with the social laws. In the second talk, van der Weide et al. described the architecture of a tutoring system that generates persuasive justifications for actions based on a model of the user's personality type. Boella et al. concluded the session with a position statement on the relationship between formal models of argumentation and models of AGM belief revision.

In the third session, a talk by Trojahn et al. described how argumentation can be used to automate the merging of conflicting ontologies (formal descriptions of domain). A paper by Ontanon and Plaza investigated how argumentation can be used to enhance group judgement in prediction markets. Finally, Letia and Groza presented a paper developing the recently proposed Argument Interchange Format (AIF).

The highlight of the workshop was a panel entitled "Perspectives on Argumentation Strategies". The panel brought together three diverse backgrounds: (1) Jan Albert van Laar, a philosopher from the University of Groningen; (2) Kate Larson, a computational game theorist from the University of Waterloo; and (3) Simon Parsons, a computer scientist from City University of New York. The attendees were also of diverse background and were involved in the discussions.

A striking difference of terminology was observed when it came to defining the term "strategy". While game-theorists have a very precise mathematical description of strategy as a prescription for action given any possible state, some computer scientists seemed to favour viewing a strategy as a commitment to a specific sequence of actions. People with a philosophical background took more notice of subtle notions of strategic manoeuvring implicit in the wording of sentences. Having said that, participants seemed in agreement that more work needs to be done to better understand strategic argumentation and to reconcile their diverse perspectives.

Iyad Rahwan
Informatics, British University in Dubai

Calls for Papers

Applications and Methodologies for Planning and Scheduling: Special issue of Journal of Scheduling, deadline 15 June.

Causality and Probability in the Sciences
Deadline 1 July

Probabilistic Models for Image Understanding: Special Issue of the International Journal of Computer Vision, deadline 21 July.

Kyburg: Special issue of Synthese commemorating Henry E. Kyburg, Jr, deadline 30 July.

Probabilistic Graphical Models in Computer Vision: Special issue of IEEE Transactions on Pattern Analysis and Machine Intelligence, deadline 16 August.

Conditionals and Ranking Functions: Special issue of Erkenntnis, franz.huber@uni-konstanz.de, deadline 31 August.

Psychology and Experimental Philosophy: Special issue of the European Review of Philosophy, deadline 1 September.

Dependence Issues in Knowledge-Based Systems: Special Issue of International Journal of Approximate Reasoning, deadline 15 September.

§4
Introducing

In this section we introduce a selection of key terms, texts and authors connected with reasoning. Entries will be collected in a volume *Key Terms in Logic*, to be published by Continuum. If you would like to contribute, please click here for more information. If you have feedback concerning any of the items printed here, please email thereasoner@kent.ac.uk with your comments.

Turing machine

An abstract machine defined by Turing in 1936 in order to investigate the properties of computable functions. It consists of an infinite tape divided in cells containing the symbols 0 or 1; the machine can read and write every cell, moving the tape one cell at a time. A set of instructions, represented as a table of transition rules for every machine's state, determines its behaviour. Turing proved the existence of a universal Turing machine that can simulate every Turing machine. The problem of determining whether a Turing machine will halt on a given input (the halting problem) is not decidable.

Mauro Murzi

Mathematical induction

A proof method that is typically used to prove a given statement for all natural numbers. The resulting proof is equivalent to an infinite number of proofs, each proving the statement for another natural number. A proof by mathematical induction is done in two steps: the base case and the inductive step. In the base case, one proves that the statement holds for the first natural number $n = 0$. In the inductive step one proves that if the statement holds for a natural number $n = m$, then it also holds for the next one, $n = m + 1$. The assumption in the inductive step that the statement holds for $n = m$ is called the induction hypothesis. In the inductive step, one uses this assumption to prove the statement for $n = m + 1$. Mathematical induction works because if one can prove a statement for $n = 0$ and one can prove that if one has proven the statement for a value m, this still holds for $m + 1$, then this process can go on indefinitely, i.e. for all natural numbers. There exist variants of mathematical induction, the simplest of which starts with another value than 0 in the base case.

Koen Vervloesem

E.J. Lemmon, 1965: *Beginning Logic*, Van Nostrand Reinhold

Lemmon's well-regarded book is a classic introductory textbook on propositional logic and predicate logic. There is a strong emphasis on proof using natural deduction. Truth table construction for propositional logic and a little elementary meta-logic are also included.

Stephen McLeod
Philosophy, Liverpool

§5
Events

June

AREA: International Workshop on Advancing Reasoning on the Web: Scalability and Commonsense, Tenerife, 1 June.

WCCI: IEEE World Congress on Computational Intelligence, Hong Kong, 1–6 June.

ULTRAMATH: Applications of Ultrafilters and Ultraproducts in Mathematics, Pisa, 1–7 June.

Meta-Analysis: Synthesis and Appraisal of Multiple Sources of Empirical Evidence, Statistical and Applied Mathematical Sciences Institute, North Carolina, 2–13 June.

CSHPS: Canadian Society for History and Philosophy of Science, University of British Columbia, Vancouver, 3–5 June.

Causality and Locality in Physics: Tilburg Center for Logic and Philosophy of Science, 13 June.

CiE: Computability in Europe 2008: Logic and Theory of Algorithms, University of Athens, Athens, 15–20 June.

Mathematical Practices: Seville, 16–17 June.

IIS: Intelligent Information Systems, Zakopane, Poland, 16–18 June.

DM: SIAM Conference on Discrete Mathematics, University of Vermont, Burlington, Vermont, 16–19 June.

Logica: Hejnice, Czech Republic, 16–20 June.

IEA-AIE: 21st International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems, Wroclaw, Poland, 18–20 June.

HOPOS: Seventh Congress of the International Society for the History of Philosophy of Science, Vancouver, Canada, 18–21 June.

HDM: Multivariate statistical modelling and high dimensional data mining, Kayseri, Turkey, 19–23 June.

EPISTEME: Law and Evidence, Dartmouth College, 20–21 June.

Is Science Inconsistent?: History and Philosophy of Science, University of Leeds, 21 June.

IPMU: Information Processing and Management of Uncertainty in Knowledge-Based Systems, Malaga, Spain, 22–27 June.

Med: 16th Mediterranean Conference on Control and Automation, Ajaccio, Corsica, 25–27 June.

ESPP: European Society for Philosophy and Psychology, Utrecht, 26–28 June.

Philosophy of Probability: Graduate Conference, London School of Economics, 27–28 June.

DGL: Second Workshop in Decisions, Games and Logic, Institute for Logic, Language and Computation, Amsterdam, 30 June – 2 July.

EWRL: European Workshop on Reinforcement Learning, INRIA, Lille, 30 June – 3 July.

July

WoLLIC: 15th Workshop on Logic, Language, Information and Computation, Edinburgh, 1–4 July.

LOFT: 8th Conference on Logic and the Foundations of Game and Decision Theory, 3–5 July.

Logic Colloquium: Bern, Switzerland, 3–8 July.

ICML: International Conference on Machine Learning, Helsinki, 5–9 July.

SMT: 6th International Workshop on Satisfiability Modulo Theories, Princeton, 7–8 July.

Computation and Cognitive Science: King's College, Cambridge, 7–8 July.

Negation and Denial: Philosophy Centre, University of Lisbon, 7–8 July.

4th MATHLOGAPS Training Workshop: University of Manchester, 7–11 July.

CAV: 20th International Conference on Computer Aided Verification, Princeton, 7–14 July.

Induction: Historical and Contemporary Approaches, 5th Ghentian Conference in the Philosophy of Science, Centre for Logic and Philosophy of Science, Ghent, 8–10 July.

Bayesian Modelling: 6th Bayesian Modelling Applications Workshop, Helsinki, 9 July.

Evaluating and Disseminating Probabilistic Reasoning Systems: Helsinki, 9 July.

UAI: Uncertainty in Artificial Intelligence, Helsinki, 9–12 July.

COLT: Conference on Learning Theory, Helsinki, 9–12 July.

North American Computing and Philosophy Conference: Indiana University, 12–14 July.

Classical Logic and Computation: Reykjavik, 13 July.

WCP4: Fourth World Congress of Paraconsistency, Melbourne, 13–18 July.

BPR: The 1st International Workshop on Bit-Precise Reasoning, Princeton, 14 July.

ITSL: Information Theory and Statistical Learning, Las Vegas, 14–15 July.

IKE: International Conference on Information and Knowledge Engineering, Las Vegas, 14–17 July.

DMIN: International Conference on Data Mining, Las Vegas, 14–17 July.

NorMAS: 3rd International Workshop on Normative Multiagent Systems, Luxembourg, 15–16 July.

DEON: 9th International Conference on Deontic Logic in Computer Science, Luxembourg, 15–18 July.

NCPW: 11th Neural Computation and Psychology Workshop, Oxford, 16–18 July.

Proof Theory: Workshop on Logic, Foundational Research, and Metamathematics II, WWU Institute for Mathematical Logic, Münster, 18–19 July.

MoChArt: Fifth Workshop on Model Checking and Artificial Intelligence, Patras, Greece, 21–22 July.

WIGSK: Inference methods based on graphical structures of knowledge, Patras, Greece, 21–22 July.

ISBA: 9th World Meeting, International Society for Bayesian Analysis, Hamilton Island, Australia, 21–25 July.

Interdisciplinary Social Sciences: Monash University Centre, Prato, Tuscany, Italy, 22–25 July.

Model Selection: Current Trends and Challenges in Model Selection and Related Areas, University of Vienna, 24–26 July.

What (Good) is Historical Epistemology?: Max Planck Institute for the History of Science, Berlin, 24–26 July.

ICHST: XXIIIrd Congress of History of Science and Technology, Budapest, 26–31 July.

ESARM: Workshop on Empirically Successful Automated Reasoning for Mathematics, Birmingham, UK, 26 July – 2 August.

First Formal Epistemology Festival: Conditionals and Ranking Functions, Konstanz, 28–30 July.

August

Language, Communication and Cognition: University of Brighton, 4–7 August.

ESSLLI: European Summer School in Logic, Language and Information, Freie und Hansestadt Hamburg, Germany, 5–15 August.

BLAST: Boolean Algebra, Lattice Theory, Algebra, Set Theory and Topology, Denver, 6–10 August.

IJCAR: The 4th International Joint Conference on Automated Reasoning, Sydney, 10–15 August.

DEMA: Designed Experiments: Recent Advances in Methods and Applications, Isaac Newton Institute, Cambridge, 11–15 August.

ICT: The Sixth International Conference on Thinking, San Servolo, Venice, 21–23 August.

MMIS-08: The 2nd KDD workshop on on Mining Multiple Information Sources, 24 August.

Compstat: International Conference on Computational Statistics, Porto, Portugal, 24–29 August.

FSKD: The 5th International Conference on Fuzzy Systems and Knowledge Discovery, Jinan, China, 25–27 August.

LSFA: Third Workshop on Logical and Semantic Frameworks, with Applications, Salvador, Bahia, Brazil, 26 August.

Logical Pluralism: University of Tartu, Estonia, 27–31 August.

Normativity: Graduate Philosophy Conference on Normativity, Amsterdam, 29–30 August.

September

IVA: The Eighth International Conference on Intelligent Virtual Agents, Tokyo, 1–3 September.

Grandeur of Reason: Rome, 1–4 September.

ECCBR 2008: 9th European Conference on Case-Based Reasoning, Trier Germany, 1–4 September.

10th Asian Logic Conference: Kobe University, Japan, 1–6 September.

COMSOC: 2nd International Workshop on Computational Social Choice, Liverpool, 3–5 September.

KES: 12th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems, Zagreb, 3–5 September.

ICANN: 18th International Conference on Artificial Neural Networks, Prague, 3–6 September.

BLC: British Logic Colloquium, Nottingham, 4–6 September.

Naturalism: Kazimierz Naturalism Workshop, Kazimierz Dolny, Poland, 6–10 September.

SMPS: Soft Methods for Probability and Statistics, 4th International Conference, Toulouse, 8–10 September.

AiML: Advances in Modal Logic, LORIA, Nancy, France, 9–12 September.

Causality and Probability in the Sciences
University of Kent, Canterbury UK, 10–12 September

Colloquium Logicum: The biennial meeting of the German Society for Mathematical Logic, Technische Universitaet Darmstadt, 10–12 September.

Logic of Change, Change of Logic: Prague, 10–14 September.

NMR: Twelfth International Workshop on Non-Monotonic Reasoning, Special Session on Foundations of NMR and Uncertainty, Sydney, 13–15 September.

ICAPS: International Conference on Automated Planning and Scheduling, Sydney, 14–18 September.

ECML PKDD: The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, Antwerp, Belgium, 15–19 September.

Spatial Cognition: Schloss Reinach, Freiburg, 15–19 September.

CSL: 17th Annual Conference of the European Association for Computer Science Logic, Bertinoro, Italy, 15–20 September.

PGM: The fourth European Workshop on Probabilistic Graphical Models, Aalborg, Denmark, 16–19 September.

KRAMAS: Workshop on Knowledge Representation for Agents and Multi-Agent Systems, Sydney, 16–19 September.

HAIS: 3rd International Workshop on Hybrid Artificial Intelligence Systems, Burgos, Spain, 24–26 September.

CLIMA-IX: 9th International Workshop on Computational Logic in Multi-Agent Systems, Dresden, Germany, 29–30 September.

October

SUM: Second International Conference on Scalable Uncertainty Management, Naples, 1–3 October.

SETN: 5th Hellenic Conference on Artificial Intelligence, Syros, Greece, 2–4 October.

Reason, Activism, and Change: University of Windsor, 3–5 October.

Formal modeling in social epistemology: Tilburg Center for Logic and Philosophy of Science, 9–10 October.

ICAI: The 1st International Conference on Advanced Intelligence, Beijing, 19–22 October.

FotFS VII: Bringing together Philosophy and Sociology of Science, Foundations of the Formal Sciences VII, Vrije Universiteit Brussel, 21–24 October.

MICAI: 7th Mexican International Conference on Artificial Intelligence, Mexico City, 27–31 October.

MDAI: Modeling Decisions for Artificial Intelligence, Barcelona, 30–31 October.

November

Automated Scientific Discovery: AAAI Fall Symposium, Arlington, Virginia, 7–9 November.

Game Theory: 5th Pan-Pacific Conference in Game Theory, Auckland, 19–21 November.

December

ICLP: 24th International Conference on Logic Programming, Udine, Italy, 9–13 December.

CIMCA'08: International Conference on Computational Intelligence for Modelling, Control and Automation, Vienna, Austria, 10–12 December.

Trends in Logic VI: Logic and the foundations of physics: space, time and quanta, Brussels, Belgium. 11–12 December

ICDM: 8th IEEE International Conference on Data Mining, Pisa, 15–19 December.

PRICAI: Tenth Pacific Rim International Conference on Artificial Intelligence, Hanoi, Vietnam, 15–19 December.

January 2009

Biomolecular Networks: from analysis to synthesis, Pacific Symposium on Biocomputing, Fairmont Orchid, The Big Island of Hawaii, 5–9 January.

3rd Indian Conference on Logic and its Application: The Institute of Mathematical Sciences, Chennai, India, 7–11 January.

§6
Jobs

Statistics, Louvain: 3 Postdoc positions, deadline 1 June.

PhD Studentship: Problems in computational social choice and the logic-based modelling of mechanisms for collective decision making, Institute for Logic, Language and Computation (ILLC), University of Amsterdam, 1 June.

Post-doctorate associate: Intelligent Systems Laboratory in the Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute (RPI) in Troy, NY.

§7
Courses and Studentships

Courses

MSc in Mathematical Logic and the Theory of Computation: Mathematics, University of Manchester.

MSc in Cognitive & Decision Sciences: Psychology, University College London.

Logic and Formal Epistemology: Summer school for undergraduates, Department of Philosophy, Carnegie Mellon University, Pittsburg, 9–27 June.

SIPTA: 3rd SIPTA School on Imprecise Probabilities, Montpellier, 2–8 July.

Probabilistic Causality: Central European University, Budapest, 21 July–1 August.

GSSPP: Geneva Summer School in the Philosophy of Physics, 22 July–8 August.

Logic Programming and Computational Logic: 3rd International Compulog/ALP Summer School, New Mexico State University, 24–27 July.

ESSLLI: European Summer School in Logic, Language and Information, Hamburg, 4–15 August.

Mathematics, Algorithms, and Proofs: Summer School, Abdus Salam International Centre for Theoretical Physics, Trieste, 11–29 August.

Causality Study Fortnight
University of Kent, Canterbury UK, 8–19 September

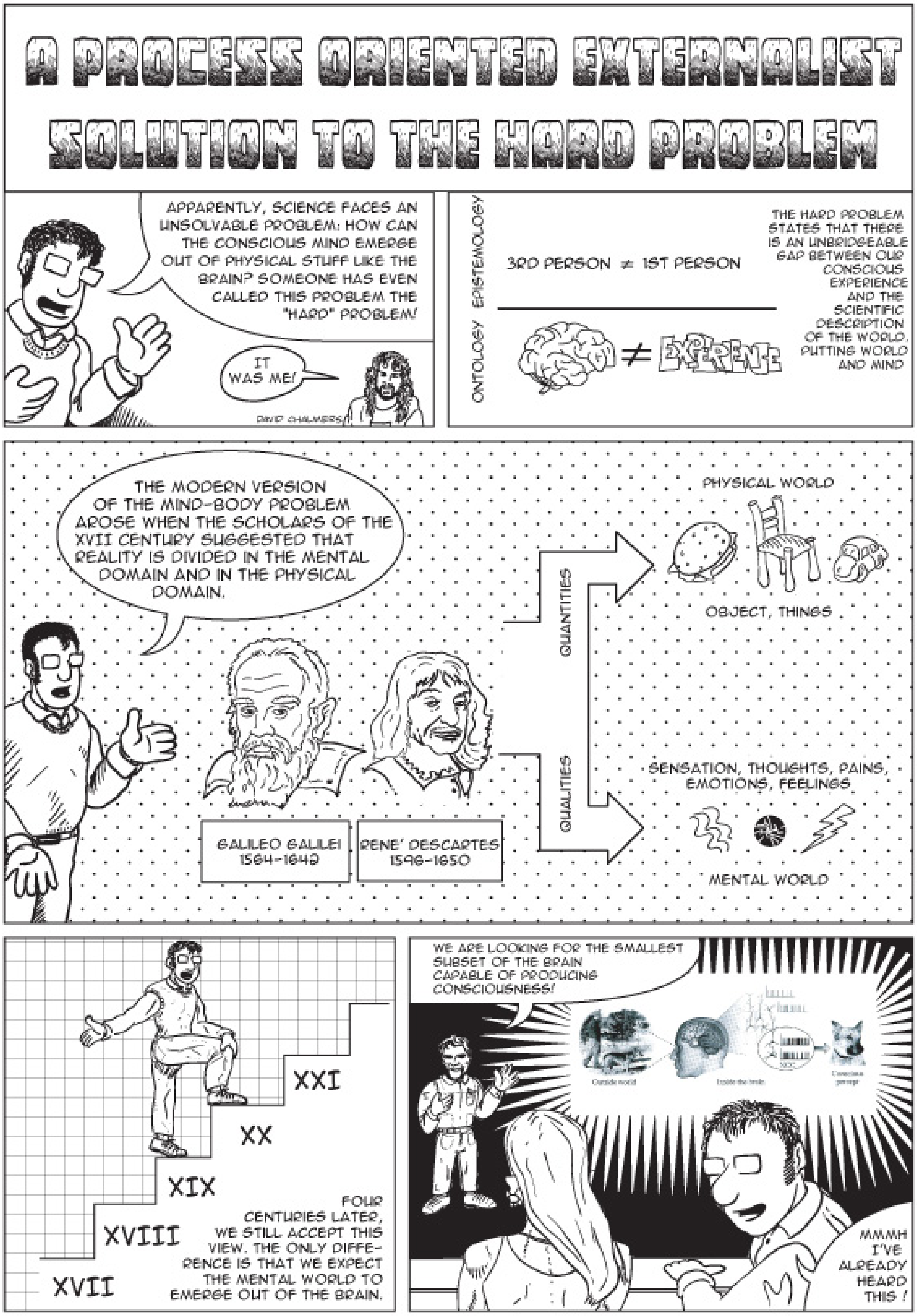
Studentships

Statistics, Louvain: 8 PhD positions, deadline 1 June.

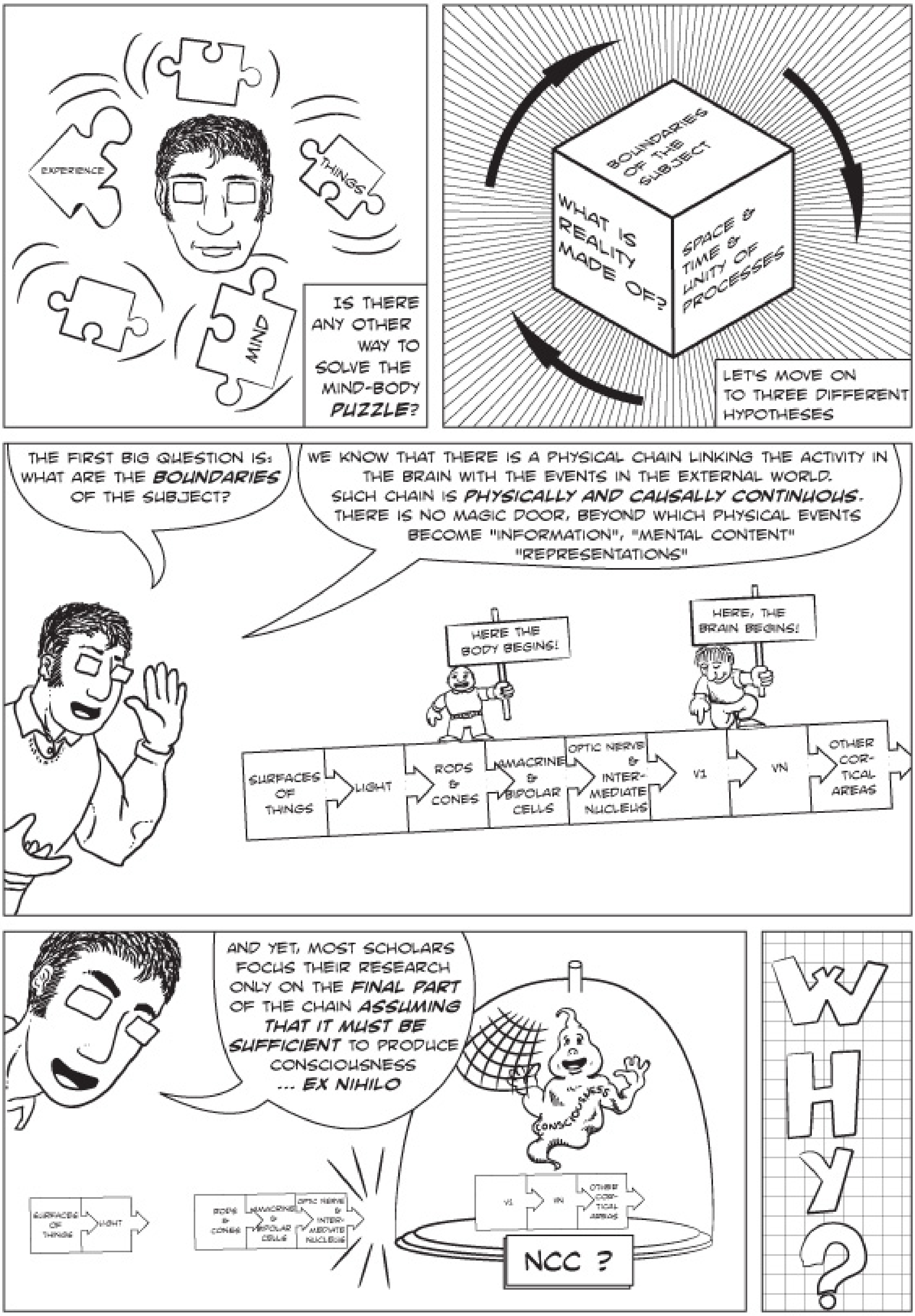
BSPS Doctoral Scholarship: Philosophy of Science, UK, deadline 1 August.

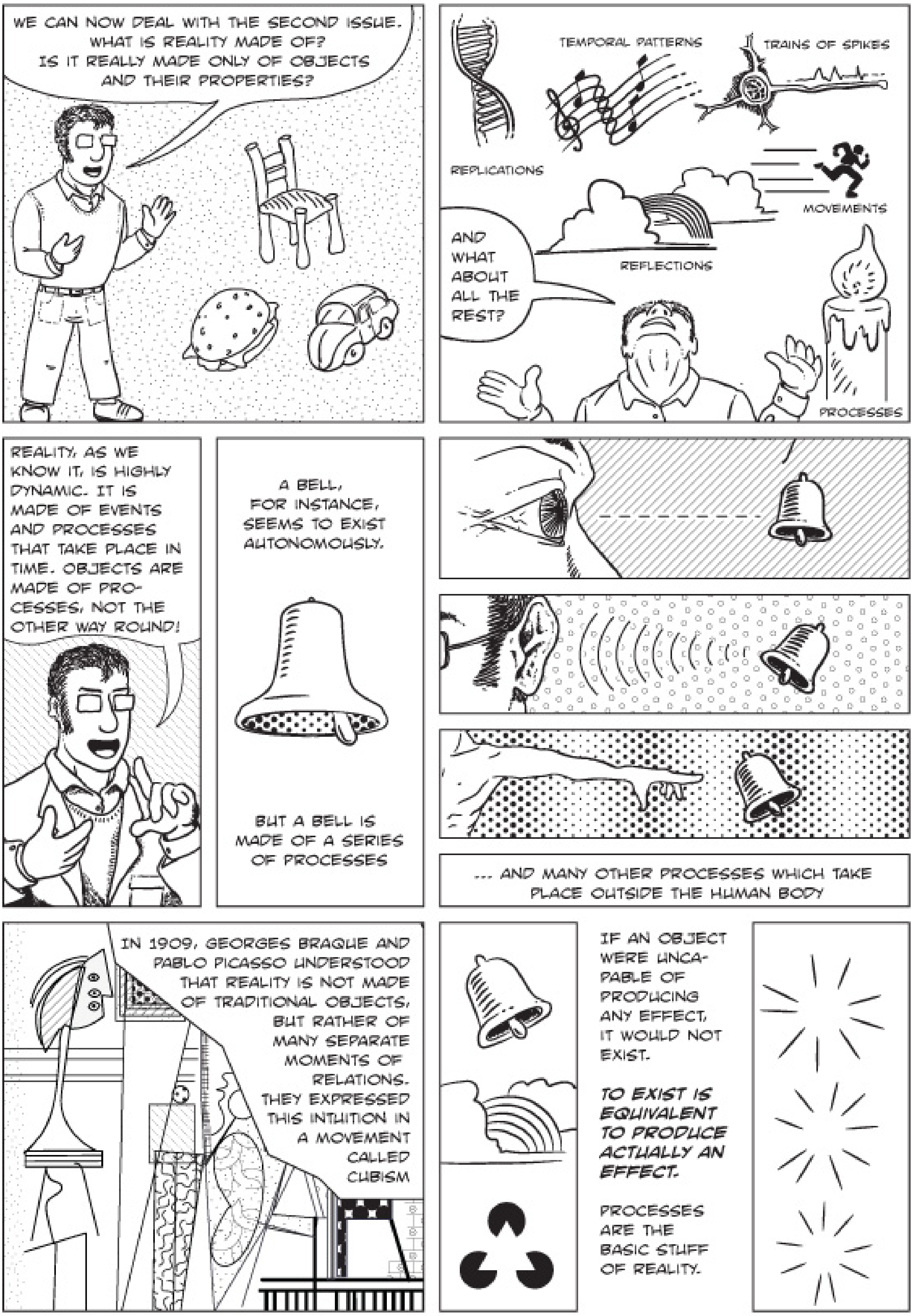
Acknowledgements

The Reasoner is a development of the progicnet academic network supported by the Leverhulme Trust.

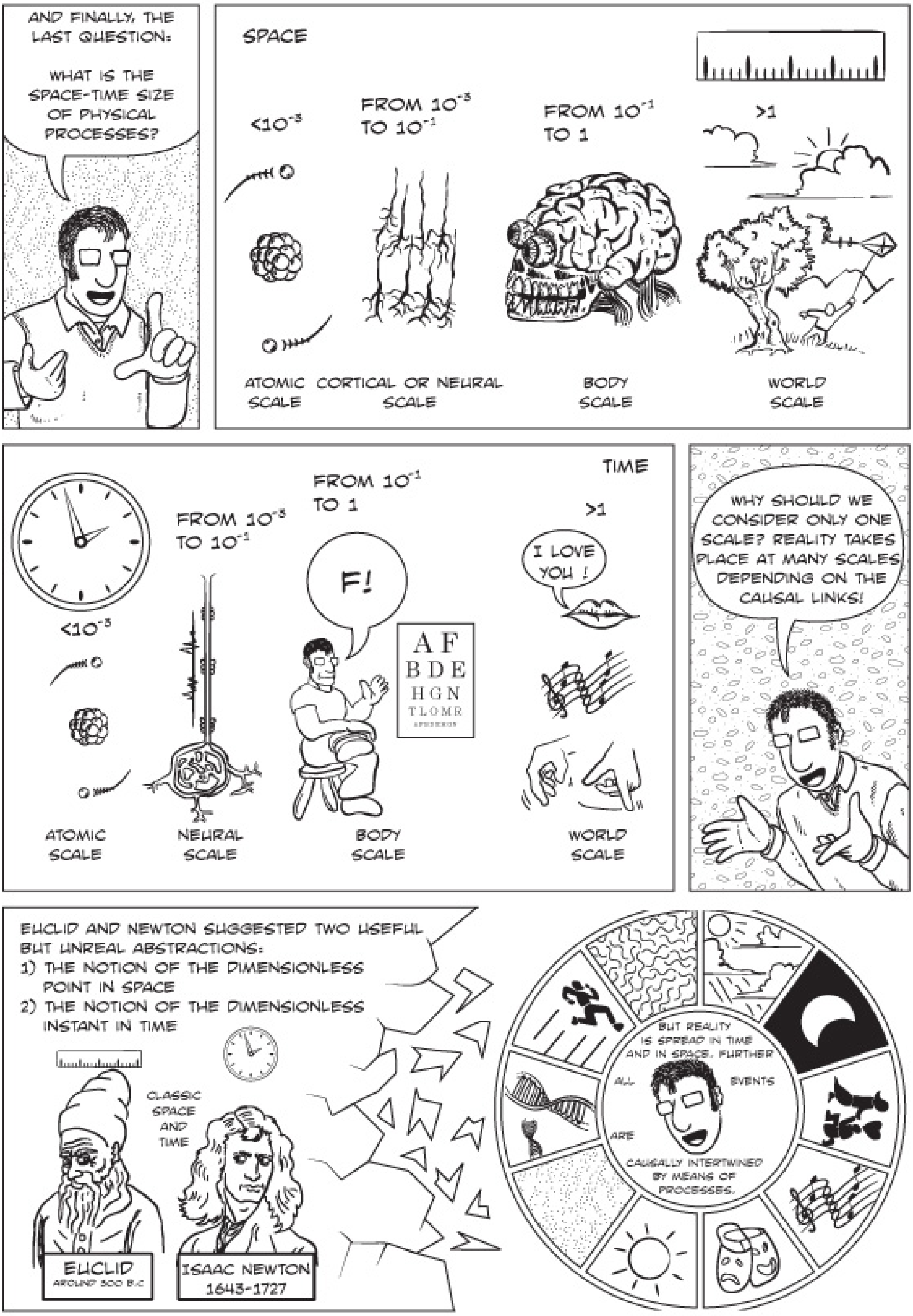

A PROCESS ORIENTED EXTERNALIST SOLUTION TO THE HARD PROBLEM
APPARENTLY, SCIENCE FACES AN UNSOLVABLE PROBLEM: HOW CAN THE CONSCIOUS MIND EMERGE OUT OF PHYSICAL STUFF LIKE THE BRAIN? SOMEONE HAS EVEN CALLED THIS PROBLEM THE "HARD" PROBLEM!
IT WAS ME!
DAVID CHALMERS
EPISTEMOLOGY
ONTOLOGY
3RD PERSON ≠ 1ST PERSON
≠ EXPERIENCE
THE HARD PROBLEM STATES THAT THERE IS AN UNBRIDGEABLE GAP BETWEEN OUR CONSCIOUS EXPERIENCE AND THE SCIENTIFIC DESCRIPTION OF THE WORLD, PUTTING WORLD AND MIND
THE MODERN VERSION OF THE MIND-BODY PROBLEM AROSE WHEN THE SCHOLARS OF THE XVII CENTURY SUGGESTED THAT REALITY IS DIVIDED IN THE MENTAL DOMAIN AND IN THE PHYSICAL DOMAIN.
GALILEO GALILEI 1564-1642
RENE' DESCARTES 1596-1650
QUANTITIES
QUALITIES
PHYSICAL WORLD
OBJECT, THINGS
SENSATION, THOUGHTS, PAINS, EMOTIONS, FEELINGS
MENTAL WORLD
XVII
XVIII
XIX
XX
XXI
FOUR CENTURIES LATER, WE STILL ACCEPT THIS VIEW. THE ONLY DIFFE-RENCE IS THAT WE EXPECT THE MENTAL WORLD TO EMERGE OUT OF THE BRAIN.
WE ARE LOOKING FOR THE SMALLEST SUBSET OF THE BRAIN CAPABLE OF PRODUCING CONSCIOUSNESS!
MMMH I'VE ALREADY HEARD THIS !

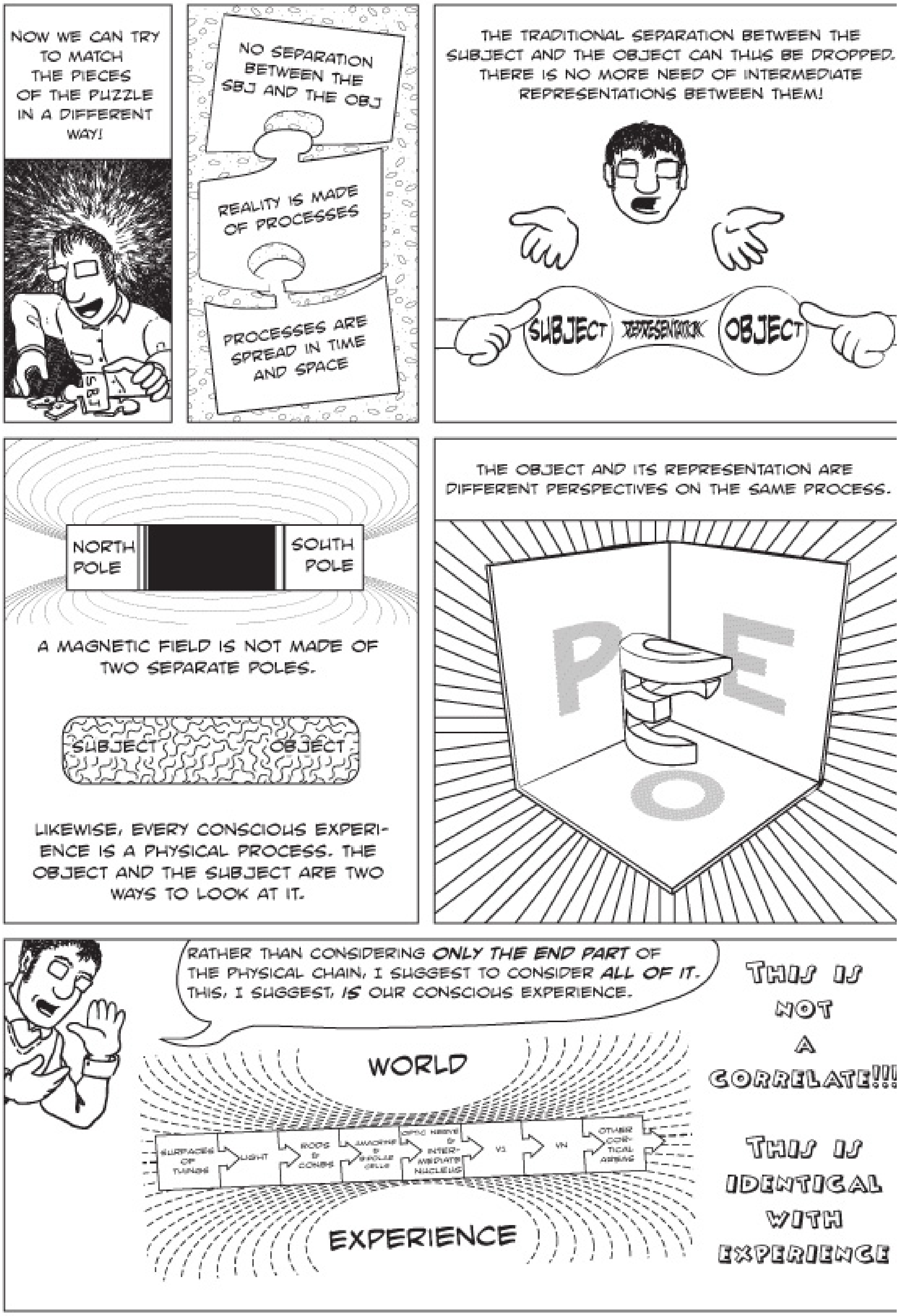

TODAY THE BRAIN HAS THE SAME BURDEN THAT THE SOUL HAD IN THE XVII CENTURY.
AT MOST, IT IS FLANKED BY THE BODY.
CONSCIOUSNESS
EMOTION
PERCEPTION
THOUGHTS
INTENTIONALITY
MR. BRAIN
SOMETIMES, WHEN A PROBLEM SEEMS TO BE COMPLETELY UNSOLVABLE, IT IS USEFUL TO ANALYZE ITS PREMISES. FOR INSTANCE, THE SBJ/OBJ DICHOTOMY.
THE CONSCIOUS REPRESENTATION OF THE WORLD
SUBJECT
OBJECT
WHAT ARE THE IMPLICIT ASSUMPTIONS THAT EVERYBODY ACCEPTS?
1
CONSCIOUSNESS TAKES PLACE INSIDE THE BRAIN OR, AT MOST, INSIDE THE BODY
2
THE WORLD IS MADE OF OBJECTS, OR THINGS, WITH DEFINED AND AUTONOMOUS PROPERTIES. THE BRAIN IS AN OBJECT AMONG THE OTHERS.
A LOT OF VERY GOOD RESEARCH IS BASED UPON THESE TWO ASSUMPTIONS
UNFORTUNATELY, IF THEY WERE WRONG, ... WELL, IT COULD BE A BIG PROBLEM!
NCC
RUMBLE!!!
ARE THEY EMPIRICALLY SOUND?????
SUPRISINGLY, NOT
NO EVIDENCE THAT THE BRAIN ALONE CAN PRODUCE MENTAL CONTENT.
ALL PHENOMENAL CONTENT IS DERIVED FROM THE WORLD
PHYSICAL LAWS ARE RELATIONAL.
EXPERIMENTS ARE RELATIONAL.
OBJECTS ARE EXPERIENCE-DEPENDENT

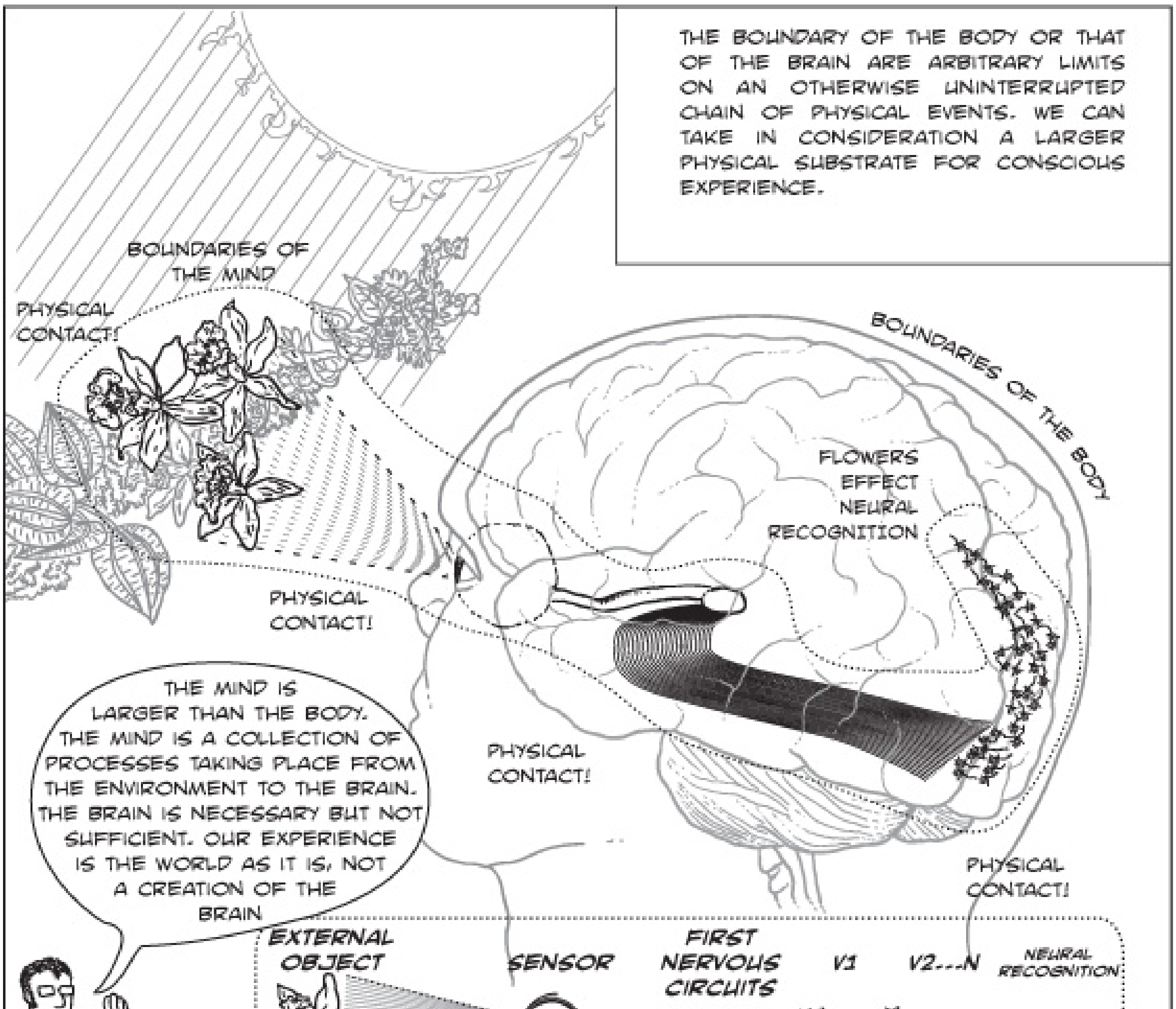

EXPERIENCE
THINGS
MIND
IS THERE ANY OTHER WAY TO SOLVE THE MIND-BODY *PUZZLE*?
WHAT IS REALITY MADE OF?
BOUNDARIES OF THE SUBJECT
SPACE & TIME & UNITY OF PROCESSES
LET'S MOVE ON TO THREE DIFFERENT HYPOTHESES
THE FIRST BIG QUESTION IS: WHAT ARE THE *BOUNDARIES* OF THE SUBJECT?
WE KNOW THAT THERE IS A PHYSICAL CHAIN LINKING THE ACTIVITY IN THE BRAIN WITH THE EVENTS IN THE EXTERNAL WORLD. SUCH CHAIN IS *PHYSICALLY AND CAUSALLY CONTINUOUS*. THERE IS NO MAGIC DOOR, BEYOND WHICH PHYSICAL EVENTS BECOME "INFORMATION", "MENTAL CONTENT" "REPRESENTATIONS"
HERE THE BODY BEGINS!
HERE, THE BRAIN BEGINS!
SURFACES OF THINGS
LIGHT
RODS & CONES
AMACRINE & BIPOLAR CELLS
OPTIC NERVE & INTER-MEDIATE NUCLEUS
V1
VN
OTHER COR-TICAL AREAS
AND YET, MOST SCHOLARS FOCUS THEIR RESEARCH ONLY ON THE *FINAL PART* OF THE CHAIN *ASSUMING THAT IT MUST BE SUFFICIENT* TO PRODUCE CONSCIOUSNESS *... EX NIHILO*
CONSCIOUSNESS
NCC ?
WHY?

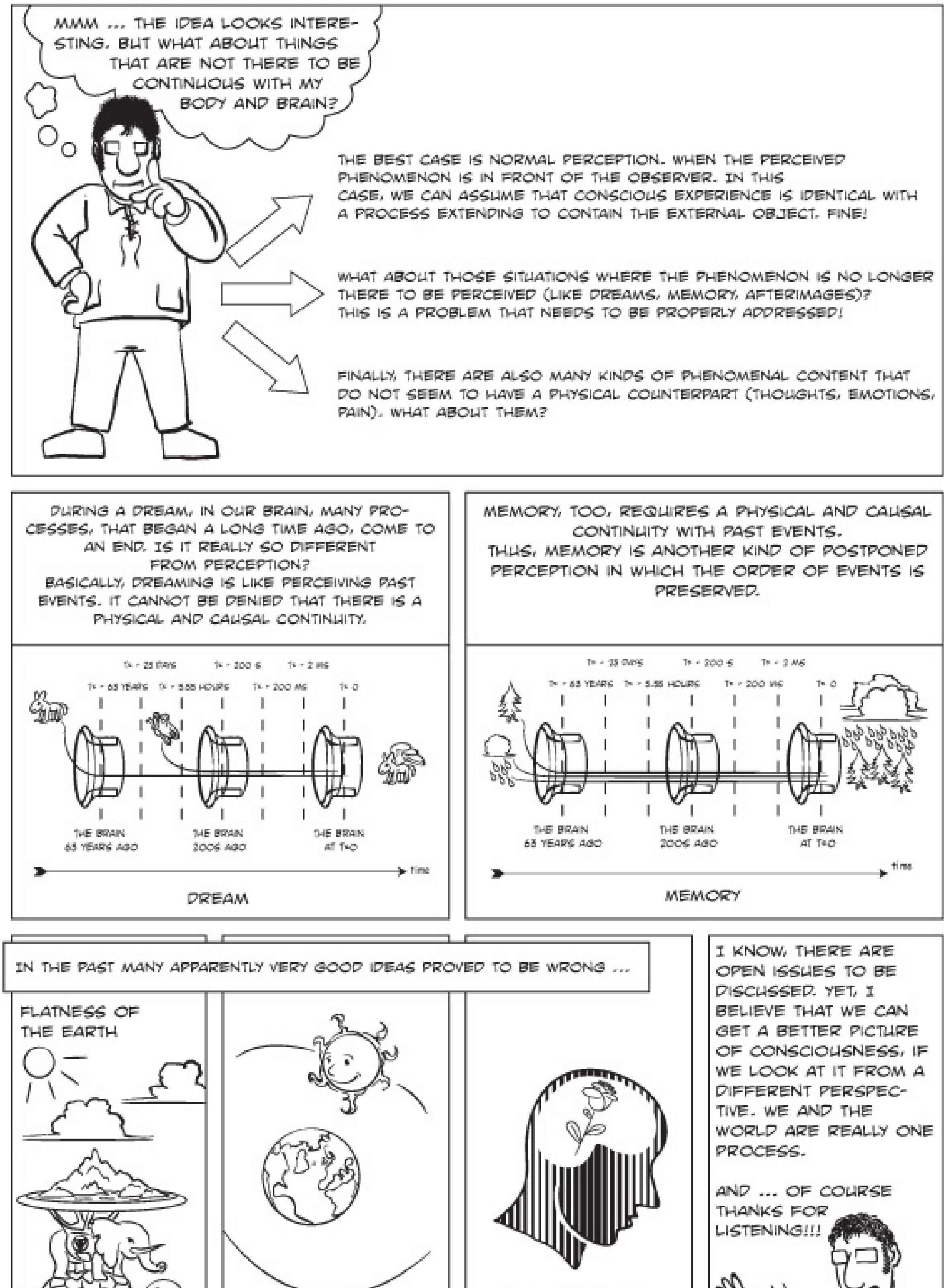


WE CAN NOW DEAL WITH THE SECOND ISSUE. WHAT IS REALITY MADE OF? IS IT REALLY MADE ONLY OF OBJECTS AND THEIR PROPERTIES?
TEMPORAL PATTERNS
TRAINS OF SPIKES
REPLICATIONS
MOVEMENTS
AND WHAT ABOUT ALL THE REST?
REFLECTIONS
PROCESSES
REALITY, AS WE KNOW IT, IS HIGHLY DYNAMIC. IT IS MADE OF EVENTS AND PROCESSES THAT TAKE PLACE IN TIME. OBJECTS ARE MADE OF PROCESSES, NOT THE OTHER WAY ROUND!
A BELL, FOR INSTANCE, SEEMS TO EXIST AUTONOMOUSLY.
BUT A BELL IS MADE OF A SERIES OF PROCESSES
... AND MANY OTHER PROCESSES WHICH TAKE PLACE OUTSIDE THE HUMAN BODY
IN 1909, GEORGES BRAQUE AND PABLO PICASSO UNDERSTOOD THAT REALITY IS NOT MADE OF TRADITIONAL OBJECTS, BUT RATHER OF MANY SEPARATE MOMENTS OF RELATIONS. THEY EXPRESSED THIS INTUITION IN A MOVEMENT CALLED CUBISM
IF AN OBJECT WERE UNCAPABLE OF PRODUCING ANY EFFECT, IT WOULD NOT EXIST.
TO EXIST IS EQUIVALENT TO PRODUCE ACTUALLY AN EFFECT.
PROCESSES ARE THE BASIC STUFF OF REALITY.


AND FINALLY, THE LAST QUESTION:
WHAT IS THE SPACE-TIME SIZE OF PHYSICAL PROCESSES?
SPACE
<10⁻³
FROM 10⁻³ TO 10⁻¹
FROM 10⁻¹ TO 1
>1
ATOMIC SCALE
CORTICAL OR NEURAL SCALE
BODY SCALE
WORLD SCALE
TIME
<10⁻³
FROM 10⁻³ TO 10⁻¹
FROM 10⁻¹ TO 1
>1
F!
A F
B D E
H G N
T L O M R
I LOVE YOU !
ATOMIC SCALE
NEURAL SCALE
BODY SCALE
WORLD SCALE
WHY SHOULD WE CONSIDER ONLY ONE SCALE? REALITY TAKES PLACE AT MANY SCALES, DEPENDING ON THE CAUSAL LINKS!
EUCLID AND NEWTON SUGGESTED TWO USEFUL BUT UNREAL ABSTRACTIONS:
1) THE NOTION OF THE DIMENSIONLESS POINT IN SPACE
2) THE NOTION OF THE DIMENSIONLESS INSTANT IN TIME
CLASSIC SPACE AND TIME
EUCLID
AROUND 300 B.C
ISAAC NEWTON
1643-1727
BUT REALITY IS SPREAD IN TIME AND IN SPACE. FURTHER
ALL EVENTS ARE CAUSALLY INTERTWINED BY MEANS OF PROCESSES.


NOW WE CAN TRY TO MATCH THE PIECES OF THE PUZZLE IN A DIFFERENT WAY!
SBJ
NO SEPARATION BETWEEN THE SBJ AND THE OBJ
REALITY IS MADE OF PROCESSES
PROCESSES ARE SPREAD IN TIME AND SPACE
THE TRADITIONAL SEPARATION BETWEEN THE SUBJECT AND THE OBJECT CAN THUS BE DROPPED. THERE IS NO MORE NEED OF INTERMEDIATE REPRESENTATIONS BETWEEN THEM!
SUBJECT
OBJECT
NORTH POLE
SOUTH POLE
A MAGNETIC FIELD IS NOT MADE OF TWO SEPARATE POLES.
SUBJECT
OBJECT
LIKEWISE, EVERY CONSCIOUS EXPERIENCE IS A PHYSICAL PROCESS. THE OBJECT AND THE SUBJECT ARE TWO WAYS TO LOOK AT IT.
THE OBJECT AND ITS REPRESENTATION ARE DIFFERENT PERSPECTIVES ON THE SAME PROCESS.
P
E
O
RATHER THAN CONSIDERING ONLY THE END PART OF THE PHYSICAL CHAIN, I SUGGEST TO CONSIDER ALL OF IT. THIS, I SUGGEST, IS OUR CONSCIOUS EXPERIENCE.
WORLD
SURFACES OF THINGS
LIGHT
RODS & CONES
OPTIC NERVE & INTERMEDIATE NUCLEUS
V1
VN
OTHER CORTICAL AREAS
EXPERIENCE
THIS IS NOT A CORRELATE!!!
THIS IS IDENTICAL WITH EXPERIENCE


THE BOUNDARY OF THE BODY OR THAT OF THE BRAIN ARE ARBITRARY LIMITS ON AN OTHERWISE UNINTERRUPTED CHAIN OF PHYSICAL EVENTS. WE CAN TAKE IN CONSIDERATION A LARGER PHYSICAL SUBSTRATE FOR CONSCIOUS EXPERIENCE.
BOUNDARIES OF THE MIND
PHYSICAL CONTACT!
BOUNDARIES OF THE BODY
FLOWERS EFFECT NEURAL RECOGNITION
PHYSICAL CONTACT!
THE MIND IS LARGER THAN THE BODY. THE MIND IS A COLLECTION OF PROCESSES TAKING PLACE FROM THE ENVIRONMENT TO THE BRAIN. THE BRAIN IS NECESSARY BUT NOT SUFFICIENT. OUR EXPERIENCE IS THE WORLD AS IT IS, NOT A CREATION OF THE BRAIN
PHYSICAL CONTACT!
PHYSICAL CONTACT!
EXTERNAL OBJECT
SENSOR
FIRST NERVOUS CIRCUITS
V1
V2...N
NEURAL RECOGNITION
LIGHT
RODOPSIN
SPIKES
MORE SPIKES
PHYSICAL CONTACT!
PHYSICAL CONTACT!
PHYSICAL CONTACT!
PHYSICAL CONTACT!
THE MIND IS LARGER, BOTH IN TIME AND IN SPACE, THAN THE BODY OF THE SUBJECT. WE DON'T EXPERIENCE REPRESENTATION OF THE WORLD, BUT RATHER THE WORLD AS IT TAKES PLACE BECAUSE OF US.
THE OBJECT, AS WE KNOW IT, DOES NOT REALLY OCCUR UNTIL IT PRODUCES AN EFFECT IN THE BRAIN
DIFFERENT SENSOR MODALITIES HAVE DIFFERENT SIZES. FURTHERMORE, DUE TO THE USE OF DEVICES AND TOOLS, WE CAN ARTIFICIALLY MODIFY THE SIZE OF OUR CONSCIOUS EXPERIENCE.
OLD BOUNDARY
NEW BOUNDARY


MMM ... THE IDEA LOOKS INTERESTING. BUT WHAT ABOUT THINGS THAT ARE NOT THERE TO BE CONTINUOUS WITH MY BODY AND BRAIN?
THE BEST CASE IS NORMAL PERCEPTION. WHEN THE PERCEIVED PHENOMENON IS IN FRONT OF THE OBSERVER. IN THIS CASE, WE CAN ASSUME THAT CONSCIOUS EXPERIENCE IS IDENTICAL WITH A PROCESS EXTENDING TO CONTAIN THE EXTERNAL OBJECT. FINE!
WHAT ABOUT THOSE SITUATIONS WHERE THE PHENOMENON IS NO LONGER THERE TO BE PERCEIVED (LIKE DREAMS, MEMORY, AFTERIMAGES)? THIS IS A PROBLEM THAT NEEDS TO BE PROPERLY ADDRESSED!
FINALLY, THERE ARE ALSO MANY KINDS OF PHENOMENAL CONTENT THAT DO NOT SEEM TO HAVE A PHYSICAL COUNTERPART (THOUGHTS, EMOTIONS, PAIN). WHAT ABOUT THEM?
DURING A DREAM, IN OUR BRAIN, MANY PROCESSES, THAT BEGAN A LONG TIME AGO, COME TO AN END. IS IT REALLY SO DIFFERENT FROM PERCEPTION? BASICALLY, DREAMING IS LIKE PERCEIVING PAST EVENTS. IT CANNOT BE DENIED THAT THERE IS A PHYSICAL AND CAUSAL CONTINUITY.
MEMORY, TOO, REQUIRES A PHYSICAL AND CAUSAL CONTINUITY WITH PAST EVENTS. THUS, MEMORY IS ANOTHER KIND OF POSTPONED PERCEPTION IN WHICH THE ORDER OF EVENTS IS PRESERVED.
THE BRAIN 65 YEARS AGO
THE BRAIN 200S AGO
THE BRAIN AT T=0
time
DREAM
THE BRAIN 65 YEARS AGO
THE BRAIN 200S AGO
THE BRAIN AT T=0
time
MEMORY
IN THE PAST MANY APPARENTLY VERY GOOD IDEAS PROVED TO BE WRONG ...
FLATNESS OF THE EARTH
GEOCENTRISM ...
CONSCIOUSNESS INSIDE THE HEAD?
I KNOW, THERE ARE OPEN ISSUES TO BE DISCUSSED. YET, I BELIEVE THAT WE CAN GET A BETTER PICTURE OF CONSCIOUSNESS, IF WE LOOK AT IT FROM A DIFFERENT PERSPECTIVE. WE AND THE WORLD ARE REALLY ONE PROCESS.
AND ... OF COURSE THANKS FOR LISTENING!!!