

Contra Darwin,
Humans are Rational Animals,
But Mere Animals are Not;
and Darwin is Irrational in Thinking Otherwise

Selmer Bringsjord
Are Humans Rational?

11/7/19

RPI

Contra Darwin,
Humans are Rational Animals,
But Mere Animals are Not;
and Darwin is Irrational in Thinking Otherwise

Or, simply:
Darwin's Dumb Idea

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Warning:

*Solely logic;
emotion & politics, no.*

But first, some logistics ...

Logistics re.The Paper (version 1)...

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Keep in mind you can write on topics not yet covered in class!!
Let's visit the syllabus now to make sure you understand ...

Logistics re. The Paper (version I)...

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Structure:

My main thesis (T) is that _____.

Argument for T ...

Anticipated one objection to your argument ...

Rebuttal in response to the objection, in defense
of your argument ...

Logistics ...

Logistics ...

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doi: 10.1017/S0140525X08003543

Darwin's mistake: Explaining the discontinuity between human and nonhuman minds

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Keywords: analogy; animal cognition; causal learning; connectionism; Darwin; discontinuity; evolution; human mind; language; language of thought; physical symbol system; reasoning; same-different; theory of mind

1. Introduction

Human animals – and no other – build fires and wheels, diagnose each other’s illnesses, communicate using symbols, navigate with maps, risk their lives for ideals, collaborate with each other, explain the world in terms of hypothetical causes, punish strangers for breaking rules, imagine impossible scenarios, and teach each other how to do all of the above. At first blush, it might appear obvious that human minds are qualitatively different from those of every other animal on the planet. Ever since Darwin, however, the dominant tendency in comparative cognitive psychology has been to emphasize the continuity between human and nonhuman minds and to downplay the differences as “one of degree and not of kind” (Darwin 1871). Particularly in the last quarter century,

many prominent comparative researchers have claimed that the traditional hallmarks of human cognition – for example, complex tool use, grammatically structured language, causal-logical reasoning, mental state attribution, metacognition, analogical inferences, mental time travel, culture, and so on – are not nearly as unique as we once thought (see, e.g., Bekoff et al. 2002; Call 2006; Clayton et al. 2003; de Waal & Tyack 2003; Matsuzawa 2001; Pepperberg 2002; Rendell & Whitehead 2001; Savage-Rumbaugh et al. 1998; Smith et al. 2003; Tomasello et al. 2003a). Pepperberg (2005, p. 469) aptly sums up the comparative consensus as follows: “for over 35 years, researchers have been demonstrating through tests both in the field and in the laboratory that the capacities of nonhuman animals to solve complex problems form a continuum with those of

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The Balderdash that is *Humans 3.0: The Upgrading of the Species*

Selmer Bringsjord

Nov 11 2019, 7pm

RPI; Room: Sage 3303

public invited

Here's an accurate encapsulation, put declaratively, of the book (H3.0) in question:

As a matter of mathematics, religious belief will disappear. Work will be obsolete, but economic well-being will be maximally high across Earth's human population; this will be enabled by AI toiling for us. Science will explain everything, including discovering the "patterns" that are us. With these patterns in our hands, we will be able to repeatedly "upload" to the physical substrate of our choosing, and thereby live forever. Then, by 2045, The Singularity will occur, the moment in time when machine intelligence exceeds human intelligence, and immediately thereafter explodes to higher and higher levels that infinitely exceed our own (relatively speaking) rodent-level one. Conveniently, we will merge with the machines so as to dodge being destroyed by them, and this "hybrid human-machine intelligence" will busy itself with [yada yada yada].

Unfortunately for Nowak (2015), author of H3.0, there is a slight problem: viz., every single claim here is but balderdash, at best. In this talk, I patiently explain this diagnosis, one bound, I know, to be emotionally disturbing to those who take such claptrap seriously.

Recall our overall context ...

Main Claim

\mathcal{R} Humans, at least neurobiologically normal ones, are fundamentally rational, where rationality is constituted by certain logico-mathematically based reasoning and decision-making in response to real-world stimuli, including stimuli given in the form of focused tests; but mere animals are *not* fundamentally rational, since, *contra* Darwin, their minds are fundamentally qualitatively inferior to the human mind. As to whether computing machines/robots are fundamentally rational, the answer is also “No.” For starters, if x can’t read, write, and create, x can’t be rational; neither computing machines/robots nor non-human animals can read nor write nor create; ergo, they aren’t fundamentally rational for this reason alone. But news for non-human animals and computing machines/robots gets much worse, for they have not the slightest chance when they are measured against \mathcal{H} .

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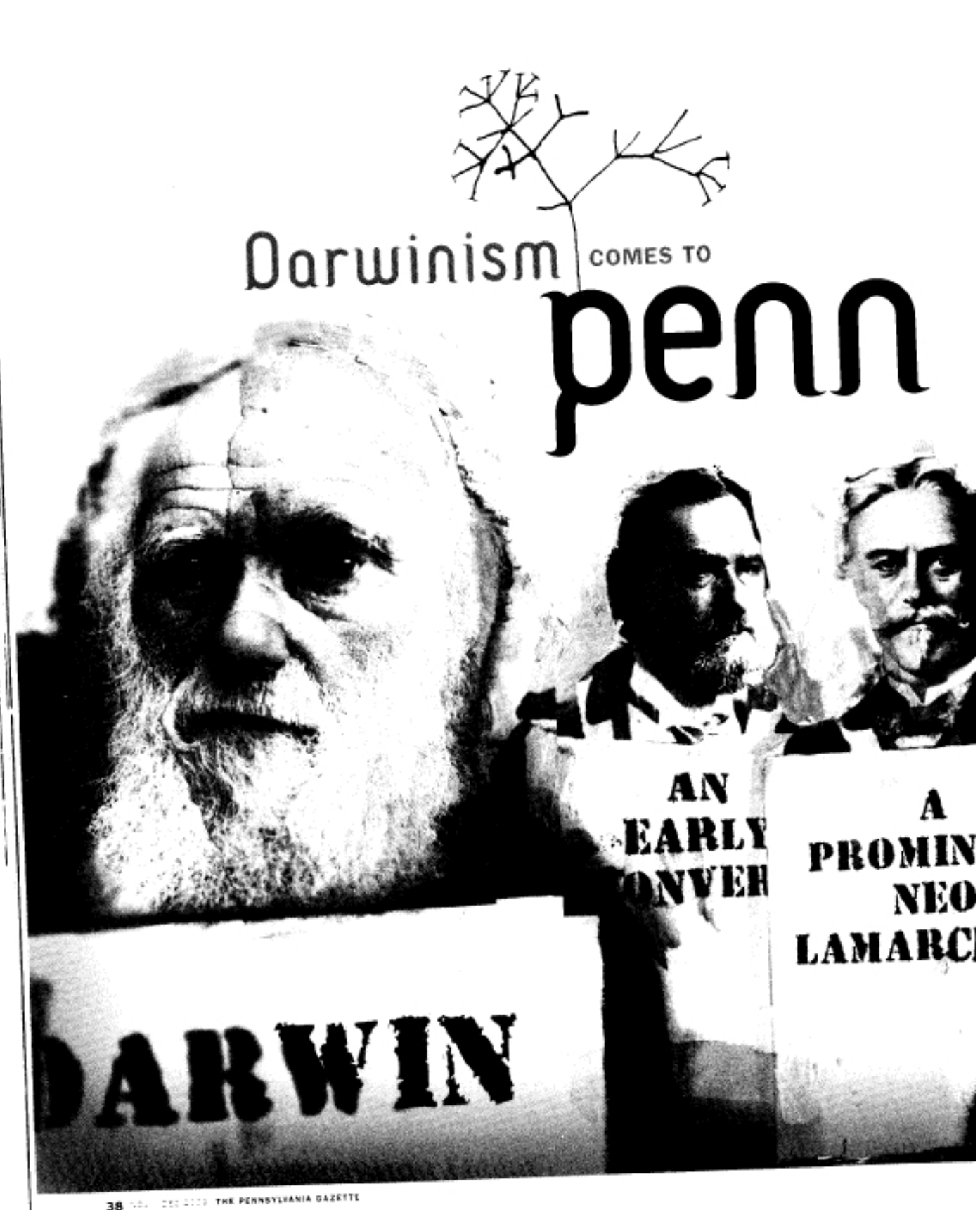
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And Supporting Main Claim ...

\mathcal{H} Humans have the ability to gain knowledge by reasoning (e.g., deductively) quantificationally and recursively over abstract concepts, including abstract concepts of a highly expressive, including infinitary, nature, expressed in arbitrarily complex natural language.

Check *your* history books ...



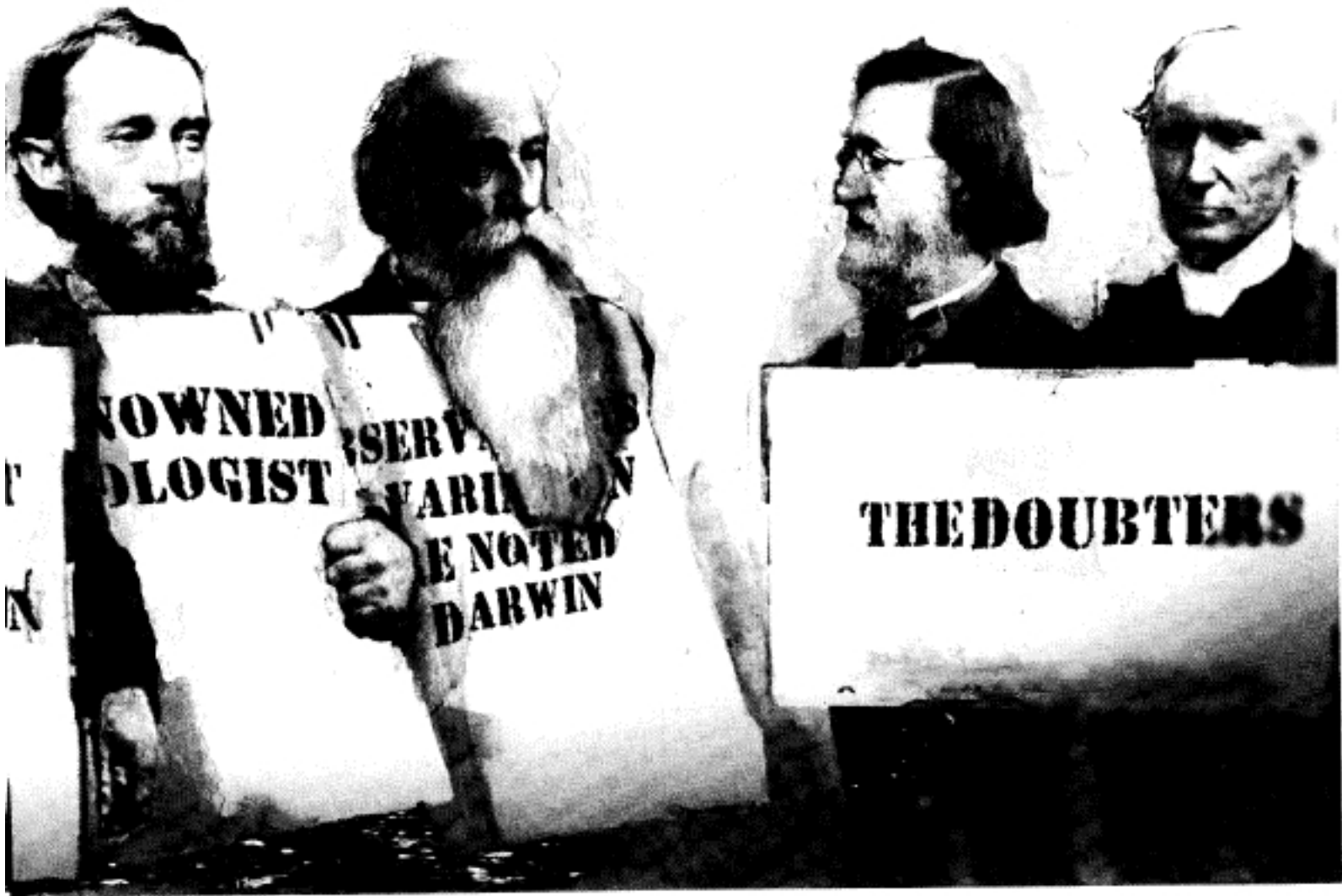
From my alma mater: *Pennsylvania Gazette* Nov/Dec 2009

A century-and-a-half after the November 1859 publication of *On the Origin of Species*, a Penn microbiologist looks back at how Darwin's ideas were received by some of the University's leading thinkers. **BY HOWARD GOLDFINE**

ON June 18, 1858, Charles Darwin received a manuscript from Alfred Russel Wallace, which outlined a theory of evolution based on natural selection. Wallace's letter came from an island in the Malay Archipelago, where he was collecting field specimens and studying the distribution of species. Wallace, like Darwin, invoked the Malthusian concept that a struggle for existence within rapidly expanding populations would be the driving force for selection of natural variants within a species. Darwin's immediate reaction was one of dismay. He had been working on his "big book on species" since his five-year voyage on the *Beagle* (1831-36) and a relatively unknown naturalist had forestalled

him. Darwin wrote to Charles Lyell, "If Wallace had my [manuscript] sketch written out in 1842, he could not have written out a better short abstract!"

Fortunately, Darwin had previously outlined his theory to his friends, the distinguished geologist Lyell and the botanist Joseph D. Hooker, and in a brief, unpublished draft to Asa Gray, a botanist at Harvard. Lyell and Hooker immediately arranged for Wallace's paper and a brief summary of Darwin's theory to be read simultaneously at the Linnaean Society in London on July 1, 1858. These were received with little comment. The president of the society later noted that nothing of great interest had happened that year.

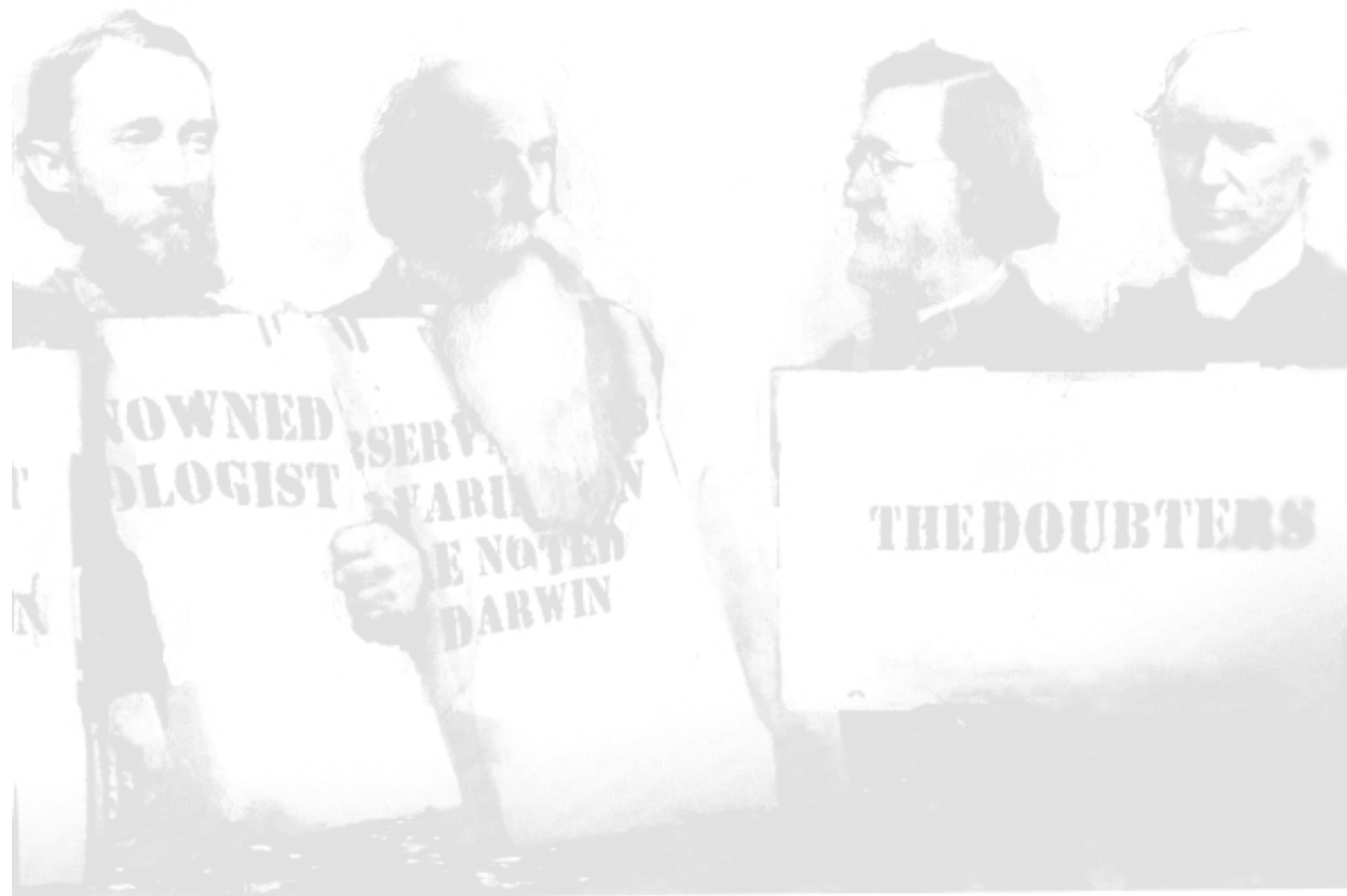


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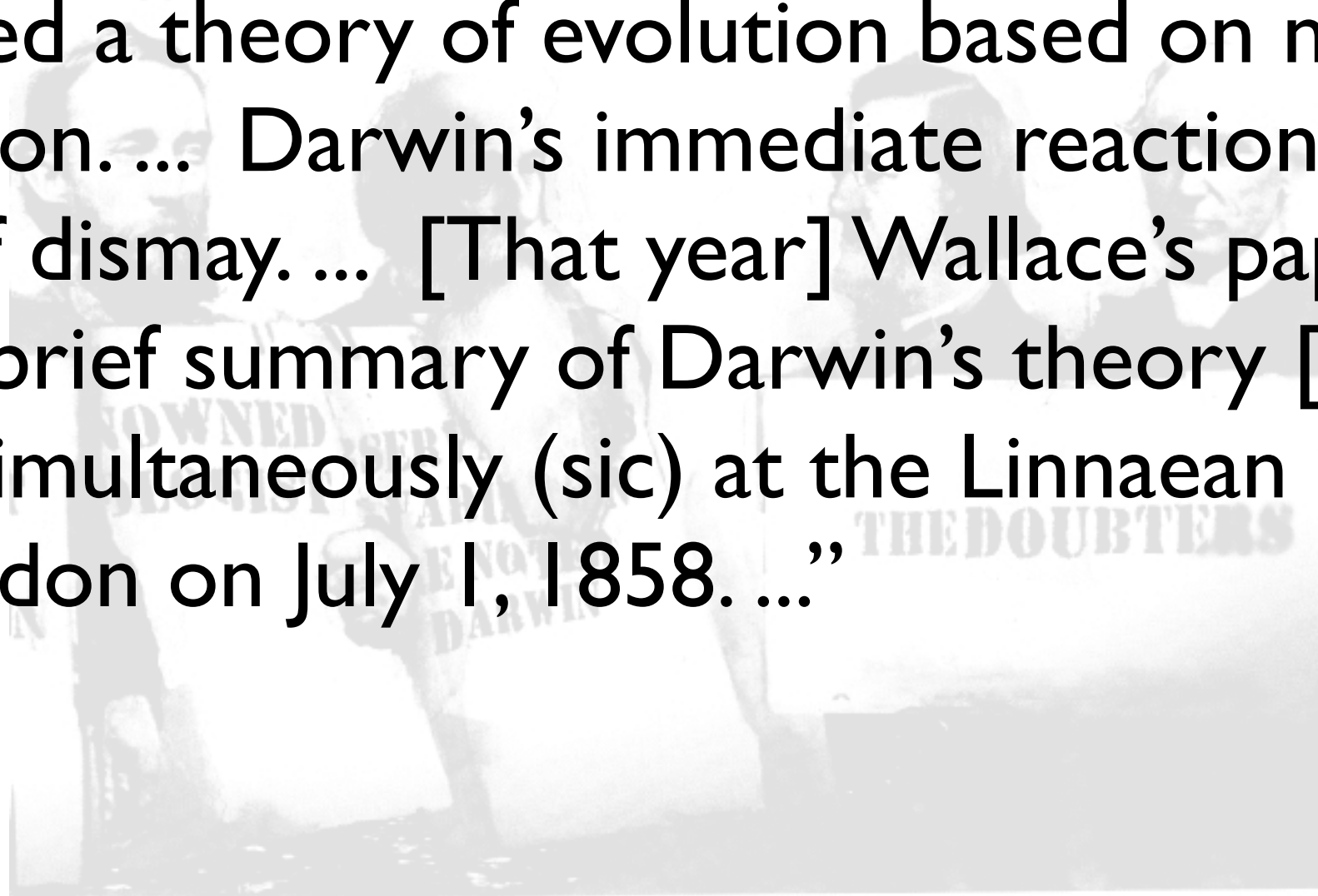
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Darwin did not.

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Descent of Man.

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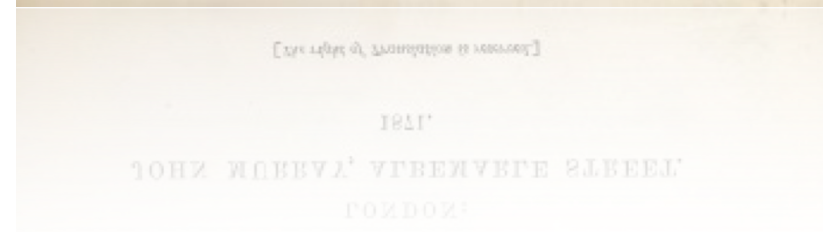
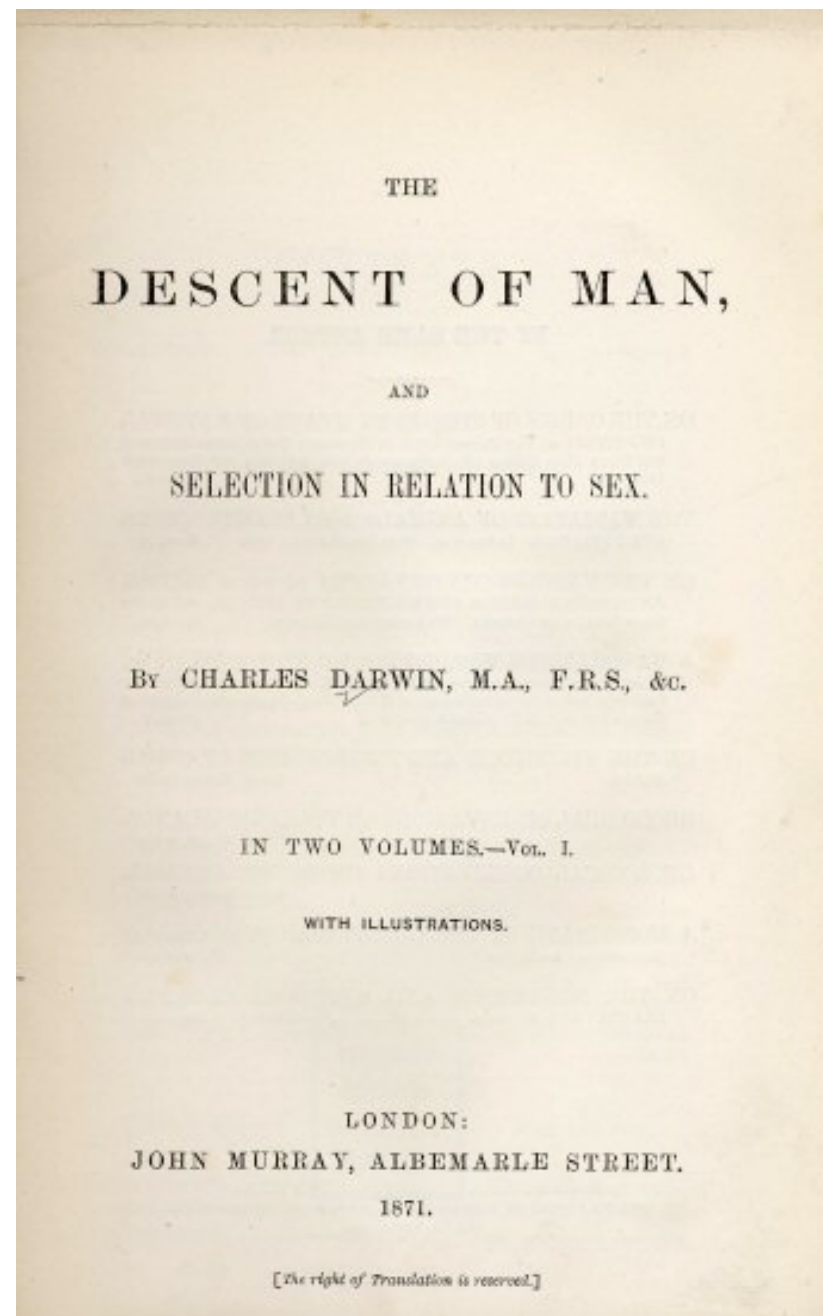
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Descent of Man.

Wallace seems to me to be right; Darwin to be wrong...

The book that shook the world, and supposedly obliterated the stupid notion that human persons are made in (in Milton's unpacked version of the phrase) God's image.



Praise for Darwin & *DoM*

Back cover of my Amazon.com version of *DoM*:
“Darwin’s engaging literary style, charming modesty, brilliant argument, and discursive method of proof makes the book an exhilarating romp through Earth’s natural history and Man’s history ...”

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Really?

I found no brilliant arguments, and not a single proof.

Perhaps the emperors
have no clothes.



A Key Proposition

A Key Proposition

\bar{A}

There is at least one mental power possessed by human persons, but not by any mere animal; and the mental powers of human persons are of a wholly different nature than those of mere animals.

Efficient Refutation of Darwin's *DoM*

∴	(1)	If human persons are the product of evolution, then it's not the case that \bar{A} holds.	from (1), (2) by <i>modus tollens</i>
	(2)	\bar{A} does hold.	
	(3)	Human persons are not the product of evolution.	
QED			

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Note: (3) doesn't deductively entail that *no* parts of human personhood are the product of evolution. In other words, (3) can be rephrased as: "Human persons are not solely and completely the product of evolution." As seen shortly, the power of human persons to carry out abstract, infinitary reasoning (as in the case of developing the tensor calculus) would be — according to Wallace & Bringsjord — something that evolution didn't produce.

Whence comes the first premise in this argument?

From Darwin Himself

From Darwin Himself

“If no organic being excepting man had possessed any mental power, or if his powers had been of a wholly different nature from those of the lower animals, then we should never have been able to convince ourselves that our high faculties had been gradually developed.”

(Descent of Man, Part One, Chapter Two)

So, Darwin devotes himself to trying to overthrow

\bar{A} .

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\bar{A} .

How?

Darwin's Defense

\therefore	(1)	Story or anecdote S .	
\therefore	(2)	There exist animals manifesting behavior B .	from (1)
	(3)	Anything behaving as in B has purportedly differentiating mental powers M_1, \dots, M_k .	
\therefore	(4)	There exist animals having purportedly differentiating mental powers M_1, \dots, M_k .	from (2), (3), (4)
\therefore	(5)	$\neg \bar{A}$	(4), def of \bar{A}
\therefore	(6)	Bringsjord's intended refutation fails.	(5), def of refutation

Darwin's Defense wrt Reasoning

∴	(1)	Story or anecdote S .	
	(2)	There exist animals manifesting behavior B .	from (1)
	(3)	Anything behaving as in B has the purportedly differentiating mental power of reasoning.	
∴	(4)	There exist animals the having purportedly differentiating mental power of reasoning.	from (2), (3), (4)

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 - Karkooking Problem ...
 - And *infinitary* deductive reasoning: “Gödel-level” Theorems ... (see Bringsjord, S. *Gödel’s Great Theorems*, forthcoming from Oxford Univ Press)

Karkooking Problem ...

Everyone karkooks anyone who karkooks someone.

Alvin karkooks Bill.

Can you infer that everyone karkooks Bill?

ANSWER:

JUSTIFICATION:

Larking Problem ...

modus ponens, etc.!

Everyone larks anyone who larks someone.

Quantificational reasoning!

Alvin larks Bill.

Can you infer that everyone larks Bill?

Recursion!

ANSWER:

Infinitary reasoning!

JUSTIFICATION:

modus ponens, etc.!

$$\frac{\phi \rightarrow \psi, \phi}{\psi}$$

Larking Problem ...

Quantificational reasoning!

$$\frac{\forall x \phi}{\phi \frac{a}{x}}$$

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THE JOURNAL OF PHILOSOPHY

IMMATERIAL ASPECTS OF THOUGHT

ANIMAL cognition and desire, from the appetite of a clam to the optical systems of vultures and frigate birds, is supposed to have neurobiological explanations resultant from, if not reducible to, universal laws of physics. That is a minimal and modest project for epistemology naturalized, one to be assisted by specialized sciences.¹

There is a larger and bolder project of epistemology naturalized, namely, to explain human thought in terms available to physical science, particularly the aspects of thought that carry truth values, and have formal features, like validity or mathematical form. That project seems to have hit a stone wall, a difficulty so grave that philosophers dismiss the underlying argument, or adopt a cavalier certainty that our judgments only simulate certain pure forms and never are real cases of, e.g., conjunction, *modus ponens*, adding, or genuine validity. The difficulty is that, in principle, such truth-carrying thoughts² cannot be wholly physical (though they might have a physical medium),³ because they have features that no physical thing or process can have at all.⁴

¹ After three centuries of amazingly successful science, we do not have a successful explanation of animal cognition, not even for a spider or a fish. Probably, we have been misconceiving the project in ways that makes science both less productive and less helpful.

² Thinking here means "judgmental understanding"—what Aristotle thought to be the actuality of the intellect (*De Anima*, bk. III, ch. 4, 429b, 30: "Mind is in a sense potentially whatever is thinkable, though actually it is nothing until it has thought"). There are many kinds of thinking; some thinkings are bodily doings, like my pouring a liquid. But it is only the processes of understanding that I am now trying to show cannot be wholly physical; understandings that involve feeling cannot be entirely nonphysical either, any more than my going for a walk can be a mere willing.

³ See Aristotle's argument (*De Anima*, bk. III, ch. 4, 429a, 10–28; see also Aquinas's commentary in *Aristotle's De Anima in the Version of William of Moerbeke and the Commentary of St. Thomas Aquinas*, Kenelm Foster and Silvester Humphries, trans. (New Haven: Yale, 1959 repr.), sec. 684–6, pp. 406–7) that the understanding cannot have an organ as sight has the eye (and nowadays philosophers suppose thinking has the brain), because the limited physical states of an organ would fall short of the contrasting states of understanding that we know we can attain.

⁴ Philosophers should not recoil with distaste at such remarks about thought, because they attribute even odder features to propositions, e.g., being infinite in number, belonging to a tight logical network with formal features like "excluded middle," and being such that every one is determinately either logically related, by implication or exclusion, or logically independent of every other; in fact, in a system of material implication, no proposition is logically independent of any other.

marks anyone who larks someone.

Bill. James Ross: These are inference schemata that humans access, but nonhuman animals don't; and these schemata are not physical, nor reducible to anything physical.

ATION:

Recursion!

Infinitary reasoning!

So, ...

minimally, deductive reasoning is valid, and grasped as such, when the content-independent *form* of the progression from premise(s) to conclusion accords with certain unassailable, abstract structures that ensure that if the premises are true, the conclusion *must* be true as well. And the production of worthwhile deductive reasoning is based on the search for interesting progressions that accord with such structures.

Hi Dan: Thx for bringing the excellent, recent paper to my attention, but this isn't the sense of 'inference' I'm talking about. This is a highly limited sense of 'inference' that can be applied to nearly any organism. Yrs, //Selmer

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Rational Inference: The Lowest Bounds

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Hi Dan: Thx for bringing the excellent, recent paper to my attention, but this isn't the sense of 'inference' I'm talking about. This is a highly limited sense of 'inference' that can be applied to nearly any organism. Yrs, //Selmer

In this paper, I aim to establish the lowest bounds of rational inference, arguing that many (though not all) of these opaque judgments in nonlinguistic animals should be counted as inferential. To clarify, there is a trivial sense of 'inference', common in cognitive psychology, on which any information processing counts as inferential; this is not the sense of inference explored here. This more philosophical notion begins instead with the idea that, at minimum, rational inference (hereafter, just 'inference') is the mental

RATIONAL INFERENCE: THE LOWEST BOUNDS 1

process of arriving at a conclusion on the basis of reasons which support it. Theoretical inference involves the process of arriving at one belief on the basis of others; for example: Fluffy is a cat, all cats love liver, therefore Fluffy loves liver. Practical inference, on which I shall focus here, involves instead the selection of an action to perform on the basis of beliefs and desires; for example: Fluffy desires to jump on the counter, Fluffy

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So, we return to ...

Darwin's Defense wrt Reasoning

∴	(1)	Story or anecdote S .	
	(2)	There exist animals manifesting behavior B .	from (1)
	(3)	Anything behaving as in B has the purportedly differentiating mental power of reasoning.	
∴	(4)	There exist animals the having purportedly differentiating mental power of reasoning.	from (2), (3), (4)

Very well. And the stories?

They embarrass me, and Darwin
may well have had a dog fetish, but
I convey some to you ...

“Dogs on Thin Ice”

“Dr. Hayes, in his work on *The Open Polar Sea*, repeatedly remarks that his dogs, instead of continuing to draw sledges in a compact body, diverged and separated when they came to thin ice, so that their weight might be more evenly distributed.”

“Thirsty Dogs”

“Houzeau relates that, while crossing a wide and arid plain in Texas, his two dogs suffered greatly from thirst, and that between thirty and forty times they rushed down the hollows to search for water. These hollows were not valleys, and there were no trees in them, or any other difference in the vegetation, and as they were absolutely dry there could have been no smell of damp earth. The dogs behaved as if they knew that a dip in the ground offered them the best chance of finding water.”

“A Smart Killer Dog”

“Mr. Colquhoun winged two wild ducks, which fell on the further side of a stream; his retriever tried to bring over both at once, but could not succeed; she then, though never before known to ruffle a feather, deliberately killed one, brought over the other, and returned for the dead bird.”

“A Murderous Dog”

“Col. Hutchinson relates that two partridges were shot at once, one being killed, the other wounded; the latter ran away, and was caught by the retriever, who on her return came across the dead bird: ‘she stopped, evidently greatly puzzled, and after one or two trials, finding she could not take it up without permitting the escape of the winged bird, she considered a moment, then deliberately murdered it by giving it a severe crunch, and afterward brought away both together. This was the only known instance of her ever having willfully injured any game.’ Here we have reason ... they show how strong their reasoning faculty must have been ...”

Please.

Please.

- This comes nearly 2000 years after Aristotle explained in no small part what deductive reasoning is, and gave simple but powerful deductive logics to make this clear ... and these dogs are said by a learned man to *reason*?

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- This comes nearly 2000 years after Aristotle explained in no small part what deductive reasoning is, and gave simple but powerful deductive logics to make this clear ... and these dogs are said by a learned man to *reason*?
- We can build *non*-reasoning robots to do much more problem-solving than this.

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- A dog can't even have third-order beliefs.

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 - Does Fido believe that you believe that your mother believes Fido is a good dog at the moment?

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- We can build *non*-reasoning robots to do much more problem-solving than this.
- A dog can't even have third-order beliefs.
 - Does Fido believe that you believe that your mother believes Fido is a good dog at the moment?
- Animals can't reason, *certainly* can't reason in infinitary fashion; and so, my friends, I am home free, and part ways with the undressed king and those who follow the groupthink of our age, and hence proclaim with the co-discoverer of evolution, that while my spine may be descended from some brute's in an epoch long past, my mind, and yours alike, is not.

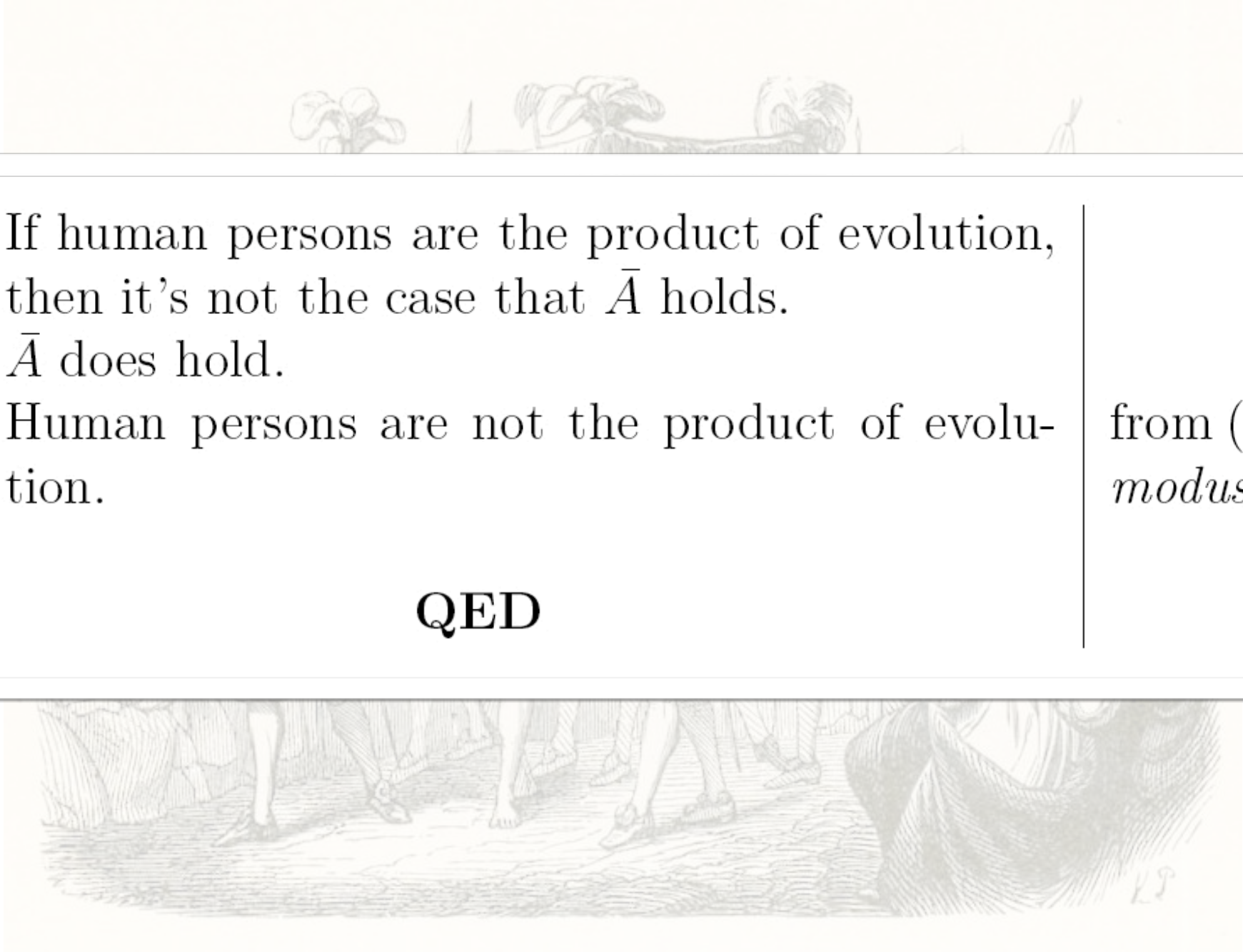
Finis



Finis



Finis

- 
- | | | |
|--------------|--|--|
| \therefore | <ul style="list-style-type: none">(1) If human persons are the product of evolution, then it's not the case that \bar{A} holds.(2) \bar{A} does hold.(3) Human persons are not the product of evolution. | from (1), (2) by
<i>modus tollens</i> |
|--------------|--|--|

QED

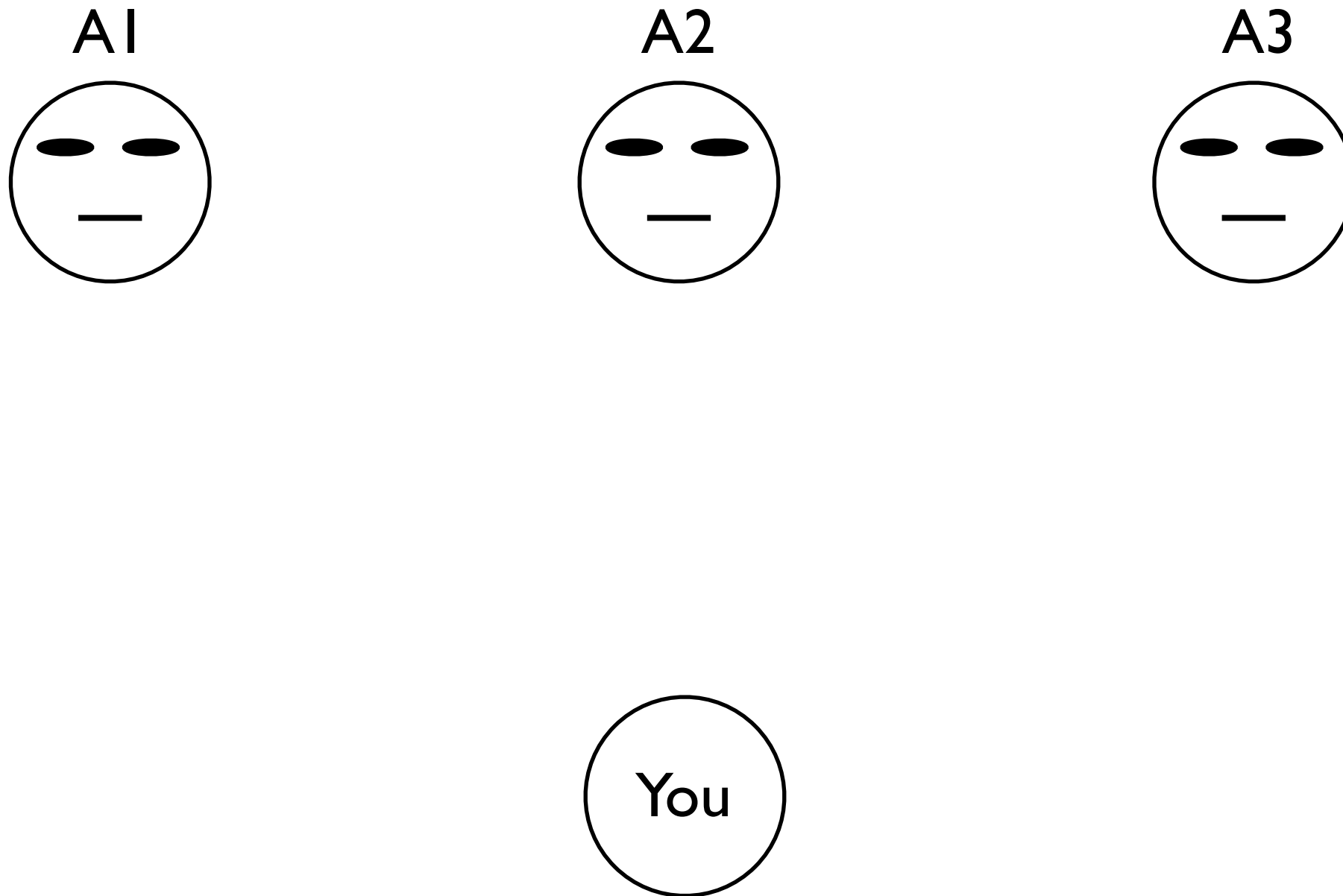
Objections?

Intergalactic Diplomacy

You have been sent to the war-torn and faction-plagued planet of Raq. Your mission is to broker peace between the warring Larpal and Tarsal factions. In a pre-trip briefing, you were informed that the Larpals are sending one delegate to the negotiations, and the Tarsals are sending a pair. You were also warned that Larpals are liars, i.e., whatever they say is false, while Tarsals are not, i.e., whatever they say is true. Upon arrival, you are met by the three alien delegates. Suddenly, you realize that though the aliens know whom among them are Larpals, and whom are Tarsals, you do not. So, you ask the first alien, “To which faction do you belong?” In response, the first alien murmurs something you can't decipher. Seeing your look of puzzlement, the second alien says to you, “It said that it was a Larpal.” Then, with a cautionary wave of an appendage and an accusatory glance at the second alien, the third alien says to you, “That was a lie!”

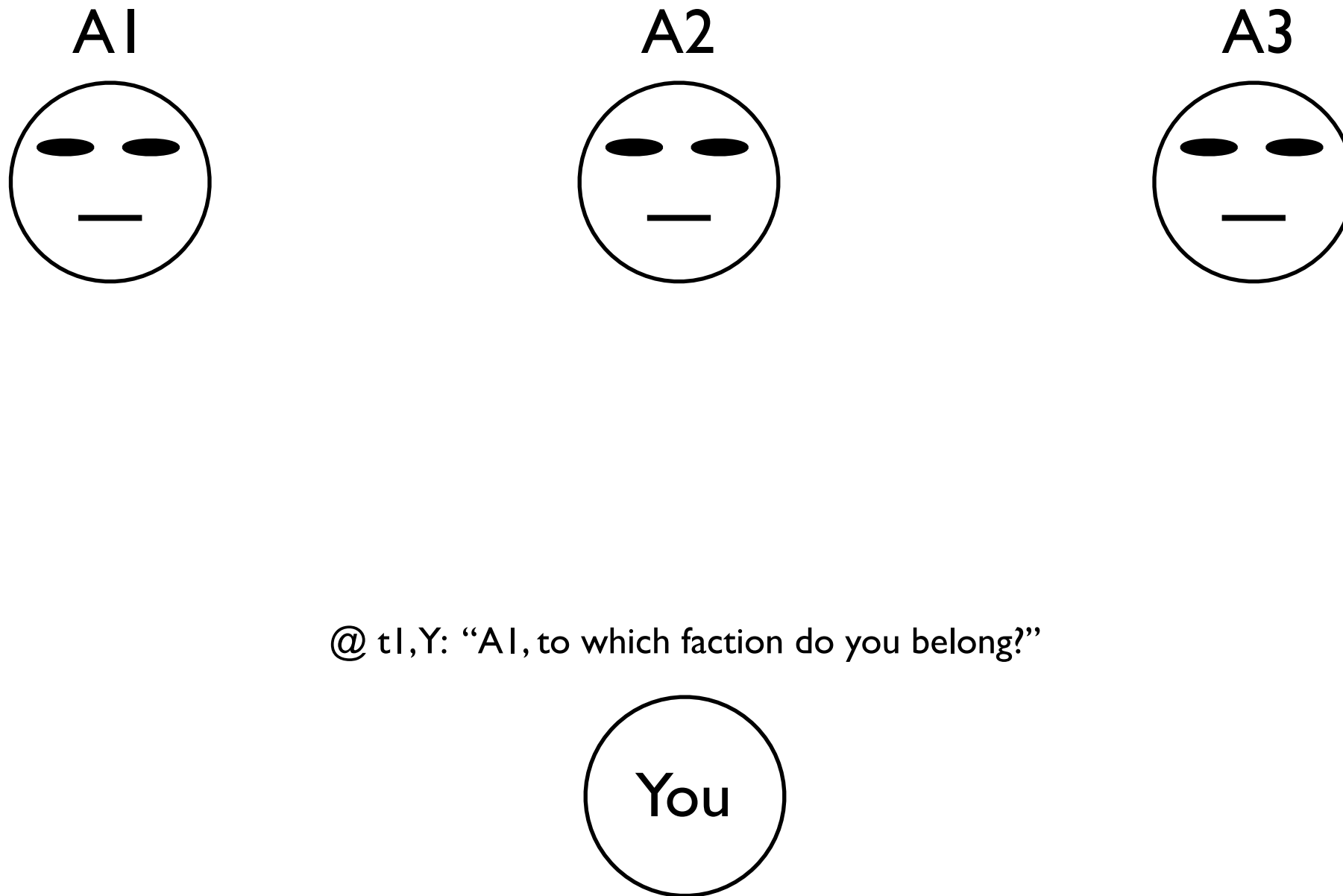
Whom among the three aliens can you trust? Prove that you're right.

The Dialogue



Solved by Christina Elmore, student in FI5 AHR?. A solution is available at the following url to check your work:
http://kryten.mm.rpi.edu/Sophisticated_KRandR_Requires_Phil.pdf.

The Dialogue



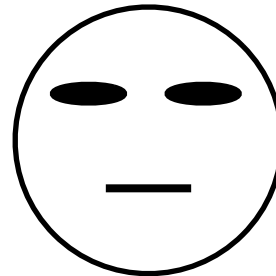
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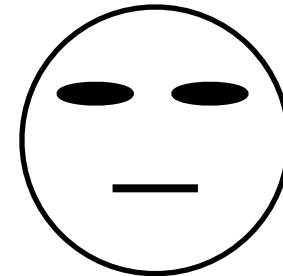
A1



A2

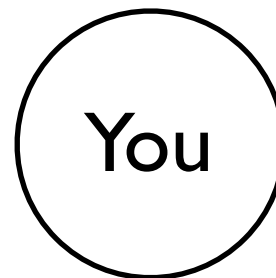


A3



@ t2,A1: “** ^% ##_ =+++”

@ t1,Y: “A1, to which faction do you belong?”



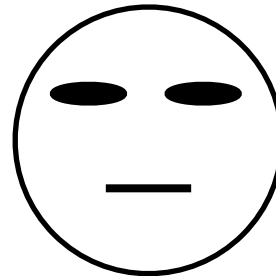
You

The Dialogue

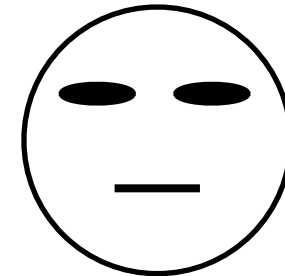
A1



A2



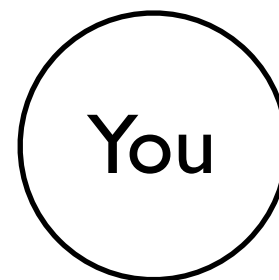
A3



@ t2,A1: “** ^% ##_ =+++”

@ t3,A2: “It said that it was a Larpal.”

@ t1,Y: “A1, to which faction do you belong?”



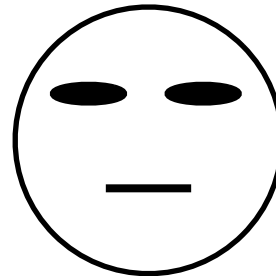
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The Dialogue

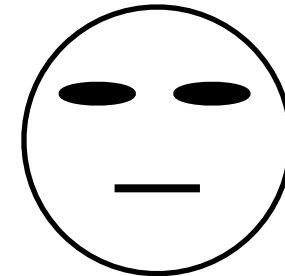
A1



A2



A3

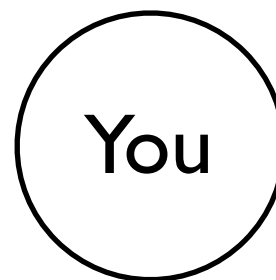


@ t2,A1: “** ^% ##_ =+++”

@ t3,A2: “It said that it was a Larpal.”

@ t4,A3: “A2,that was a lie!”

@ t1,Y: “A1, to which faction do you belong?”

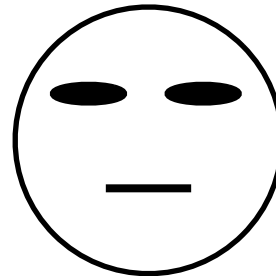


The Dialogue

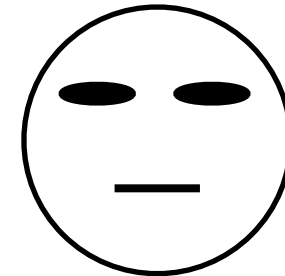
A1



A2



A3

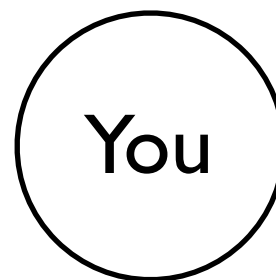


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Whom among the aliens here can you trust? *Prove that you're correct!*

Solved by Christina Elmore, student in FI5 AHR?. A solution is available at the following url to check your work:
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More on Larpals, Tarsals, & Lying ...

L lies to $D =_{\text{df}}$ There is a proposition p such that (i) either L believes that p is not true or L believes that p is false and (ii) L asserts p to D .

$$\mathbf{C} \left(\forall_{l,d,p,m} \text{happens}(\text{action}(l, \text{lies}(p, d)), m) \leftrightarrow \left(\begin{array}{c} \mathbf{B}(l, \neg \text{holds}(p, m)) \wedge \\ \text{happens}(\text{action}(l, \text{asserts}(p, d)), m) \end{array} \right) \right) \quad (1)$$

L asserts p to $D =_{\text{df}}$ L states p to D and does so under conditions which, he believes, justify D in believing that he, L , accepts p .

$$\mathbf{C} \left(\forall_{l,d,p,m} \text{happens}(\text{action}(l, \text{asserts}(p, d)), m) \leftrightarrow \left(\begin{array}{c} \text{happens}(\text{action}(l, \text{states}(p, d)), m) \wedge \\ \mathbf{B}(l, \mathbf{B}(d, \text{happens}(\text{action}(l, \text{states}(p, d)), m) \rightarrow \mathbf{B}(l, \text{holds}(p, m)))) \end{array} \right) \right) \quad (2)$$

from Bringsjord, Clark, Taylor (2014) “Sophisticated Knowledge Representation and Reasoning Requires Philosophy”
(http://kryten.mm.rpi.edu/Sophisticated_KRandR_Requires_Phil.pdf)

(For a fresh treatment of mendacity from the perspective of AI and computational logic, see Clark (2010) *Cognitive Illusions and the Lying Machine: A Blueprint for Sophistic Mendacity*).