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EXPLAINING THE "MAGIC" OF CONSCIOUSNESS*

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Abstract. Is the view supported that consciousness is a mysterious phenomenon and cannot succumb, even with much effort, to the standard methods of cognitive science? The lecture, using the analogy of the magician's praxis, attempts to highlight a strong but little supported intuition that is one of the strongest supporters of this view. The analogy can be highly illuminating, as the following account by LEE SIEGEL on the reception of her work on magic can illustrate it: "I'm writing a book on magic", I explain, and I'm asked, "Real magic?" By *real magic* people mean miracles, thaumaturgical acts, and supernatural powers. "No", I answer: "Conjuring tricks, not real magic". *Real magic,* in other words, refers to the magic that is not real, while the magic that is real, that can actually be done, is *not real magic*. I suggest that many, e.g., DAVID CHALMERS has (unintentionally) perpetrated the same feat of conceptual sleight-of-hand in declaring to the world that he has discovered "The Hard Problem" of consciousness. It is, however, possible that what appears to be the Hard Problem is simply the large bag of tricks that constitute what CHALMERS calls the Easy Problems of Consciousness. These all have mundane explanations, requiring no revolutions in physics, no emergent novelties. I cannot prove that there is no Hard Problem, and CHALMERS cannot prove that there is. He can appeal to your intuitions, but this is not a sound basis on which to found a science of consciousness. The "magic" (i.e., the supposed unexplainability) of consciousness, like stage magic, defies explanation only so long as we take it at face value. Once we appreciate all the non-mysterious (i.e., explainable) ways in which the brain can create benign "user-illusions", we can begin to imagine how the brain creates consciousness.

Keywords: real magic, Hard Problem, Indian Rope Trick, consciousness, déjŕ vu

It seems to many people that consciousness is a mystery, the most wonderful magic show imaginable, an unending series of special effects that defy explanation. I think that they are mistaken, that consciousness is a physical, biological phenomenon – like metabolism or reproduction or self-repair – that is exquisitely ingenious in its operation, but not miraculous or even, in the end, mysterious. Part of the problem of explaining consciousness is that there are powerful forces acting to make us think it is more marvelous than it actually is. In this it is like *stage* magic, a set of phenomena that exploit our gullibility, and even our desire to be fooled, bamboozled, awe-

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struck. The task of explaining stage magic is in some regards a thankless task; the person who tells people how an effect is achieved is often resented, considered a spoilsport, a party-pooper. I often get the impression that my attempts to explain consciousness provoke similar resistence. Is it not *nicer* if we all are allowed to wallow in the magical mysteriousness of it all? Or even this: If you actually manage to explain consciousness, they say, you will diminish us all, turn us into mere protein robots, mere *things*.

Such is the prevailing wind into which I must launch my work, but sometimes the difficulty of the task inspires strategies that exploit the very imagery that I wish in the end to combat. The comparison between consciousness and stage magic is particularly apt, for the romantic and gullible among us have much the same yearning regarding stage magic that they have regarding consciousness. LEE SIEGEL draws our attention to the fundamental twist in his excellent book, *Net of Magic: Wonders and Deceptions in India* (1991):

> "I'm writing a book on magic", I explain, and I'm asked, "Real magic?" By *real magic* people mean miracles, thaumaturgical acts, and supernatural powers. "No", I answer: "Conjuring tricks, not real magic". *Real magic*, in other words, refers to the magic that is not real, while the magic that is real, that can actually be done, is *not real magic.* (p. 425)

It cannot be *real* if it is explicable as a phenomenon achieved by a bag of ordinary tricks – cheap tricks, you might say. And that is just what many people claim about consciousness, too. So let us pursue the parallel with stage magic, and see how some of the effects of consciousness might be explained.

For more than a thousand years, the Indian Rope Trick has defied all attempts at explanation. Not some simple stunt in which a rope is thrown into the air and then climbed by the agile magician, the full Indian Rope Trick, the Indian Rope Trick of legend, is a much more shocking episode of magic.

> The magician throws a rope into the air, where it hangs, its top somehow invisible. A young assistant climbs the rope and disappears into thin air, but then is heard to taunt the magician, who takes a huge knife in his teeth and climbs the rope himself, disappearing in turn. A terrible fight is heard but not seen, and bloody limbs, a torso and a freshly severed head fall out of the sky onto the carpet beneath the rope. The magician reappears, climbing sadly down the rope, and bewailing the hot temper that has led him to murder his young assistant. He gathers up the bloody body parts and places them in a large covered basket, and asks the audience to join him in a prayer for the dead little boy, whereupon the lad jumps whole out of the basket, and all is well.

Has it ever been performed? Nobody knows. Thousands, perhaps millions, of people over hundreds of years have fervently believed that they themselves – or their

brothers or uncles or cousins or friends – had witnessed the great spectacle with their own eyes. In 1875, Lord NORTHBROOK offered the amazing fortune of 10,000 pounds sterling to anyone who could perform it. In the 1930s, the *Times of India* offered 10,000 rupees, and many others have offered huge rewards (SIEGEL 1991, pp. 199–200). The money has always gone unclaimed, so the sober judgment of those in the best position to know is that the Indian Rope Trick is a sort of archetypal urban legend, a mere intentional object, a notional trick, not a real one.

But wait: Many people sincerely believe that the trick has been performed. Some of them, apparently, sincerely believe *that they have seen* the trick performed. If some people sincerely believe that they have seen the trick performed, does not that settle it? What else is a magic trick but the creation of sincerely held false beliefs about having witnessed one marvelous event or another? The magician doesn't *really* saw the lady in half; he only *makes you think you saw* him do it! If a magician can somehow or other make you think you saw him climb a rope, disappear, dismember a boy, and bring the boy back to life, he has performed the Indian Rope Trick, has he not? What more is required?

It matters how the belief is induced, it seems. If a magician managed somehow to hypnotize his entire audience, and then simply *told them* in gripping detail what he was doing, when he snapped his fingers and brought his audience awake with a standing ovation and exclamations of wonder, many of us would feel cheated. Not that magic is not always a bit of a cheat, but this is over the line, we feel. This does not count. It also does not count if the magician simply bribes people to declare they have seen the feat – even if the effect of many such shills eagerly declaring their amazement managed to overwhelm one or two innocent audience members into sincerely avowing the same false belief. (Compare SOLOMON ASCH's famous experiments in the social manipulation of belief.) Coming by another, high-tech route, if some magician with too much money commissioned the computer-graphics mavens at Industrial Light and Magic to create on videotape an ultra-realistic computer rendering of such a stunt, a videotape so apparently authentic that it could be sent as a "live feed" to CNN without their being able to determine that it was counterfeit, this, too would be viewed by most if not all as not meeting the challenge to perform the trick. I doubt if you could collect the prize money with such a stunt, even though millions of people were thereby convinced that they had seen a real event on "live" television. What is missing in both scenarios is actually not easy to say: it is quite all right to use smoke and mirrors, deceptive lighting, fake limbs and blood. Is it all right to use dozens of assistants? Yes, if they are backstage doing one thing or another, but what if they are disguised as audience members and are required to jump up and obscure the line of sight of the real audience members at crucial junctures? Where in the chain of causation leading to belief is the last permissible site of intervention? The "power of suggestion" is a potent tool in the magician's kit, and sometimes the

magician's *words* play a more important role than anything the magician *shows* or *does*.

These observations draw our attention to the ill-behaved gaggle of tacit presumptions that govern our sense of what counts as a proper magic trick. It is not disturbing to acknowledge that our concept of *what counts* is in some regards disheveled, or unclear, since after all, we don't rest anything very heavy on our tacit understanding. Magicians may try to abuse our concept of magic, and all they risk is the loss of an audience if they misjudge what they can pass off as magic. It is not brain science, after all. It is just entertainment.

But when the topic *is* brain science, something similar can take place. When we think about the phenomena of consciousness and wonder how they are accomplished in the brain, it is not at all unusual to fall back on the hyperbolic vocabulary of "magic". The mind plays tricks on us. The way the brain produces consciousness is *quite* magical. Those who insist that consciousness is terminally mysterious, for instance, are wont to wallow in the stunning inexplicability of the effects known to us as the phenomenology of consciousness. And when one of these effects is explained, one can sometimes observe the same disappointment, the same resistance: to explain an effect is to diminish it.

Take *déjŕ vu,* for instance. Some have thought it a phenomenon at the magical end of the spectrum: according to them, we sometimes experience events that we know we have experienced before, in another life, in another astral plane, in another dimension. And we wonder what stunning insights this gives us into the cyclical nature of time, the transmigration of the soul, precognition, ESP, ... Pretty exciting stuff! But then we come to recognize that the phenomena of *déjŕ vu* could be explained in a much simpler way. You do not actually *remember* having experienced this very event as some time in the past; you just mistakenly *think* that you do. As JANET hypothesized more than half a century ago, it could be that it "results from an interruption of the perceptual process so that it splits into a past, as well as another current experience" (1942); *Les Dissolutions de la Memoire,* quoted by TOLLAND in *Disorders of Memory,* 1968, p. 152.

Here is a simple diagram inspired by JANET's suggestion. Suppose that the visual system is redundant, containing two streams, A and B, which may be similar in their functions and powers or different, as you like. And suppose that both streams send their signals through a turnstile of sorts, a familiarity detector (or, alternatively, a novelty detector) that discriminates all incoming signals into those that are novel and those that have been encountered before. (There is evidence that the hippocampus has this very task among its duties, so this is not an entirely gratuitous speculation. See JEFFREY GRAY 1995, and my commentary, "Overworking the Hippocampus", both in *Behavioral and Brain Sciences*.) And let us suppose further that the transmission of signals through channel B is ever so slightly delayed, so that it

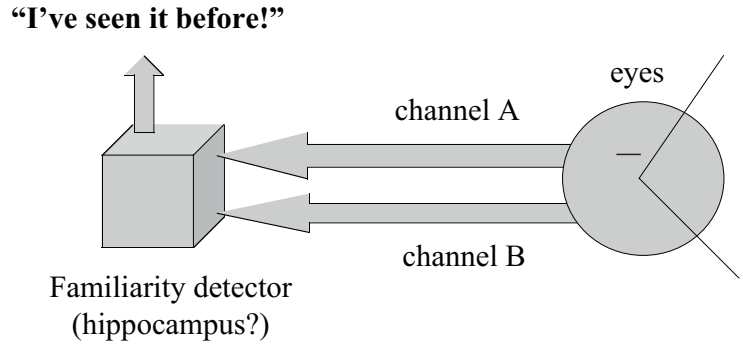


Figure 1. JANET's modell for *déjŕ vu*

arrives at the familiarity detector a few milliseconds after the signal in channel A. When the channel A signal arrives, it registers its novel footprint in the familiarity detector, and almost immediately that memory trace is discovered to match the signal now arriving on channel B, triggering the familiarity detector to issue its positive verdict: "I've already seen this!" Not weeks ago, or months ago, or in a different life, but only a few milliseconds ago. What sequelae are provoked by this false alarm will depend on further details of the subject's psychology, ranging from slack-jawed wonder and exclamations about time travel to the slightest jaded smirk: "Oh, I just had a *déjŕ vu* moment. I've seen *those* before, too!"

Such a simple transmission delay in a redundant system would be sufficient to explain the phenomenon of *déjŕ vu,* but if the two-channel model inspired by Janet's conjecture could explain it, so could the simpler, one-channel system shown here.

In this simpler model, some perturbation or other – the death of a neuron, a neuromodulator imbalance, fatigue of one sort or another – could spuriously trigger a false positive verdict in the familiarity detector, and the rest of the sequelae could elabo-

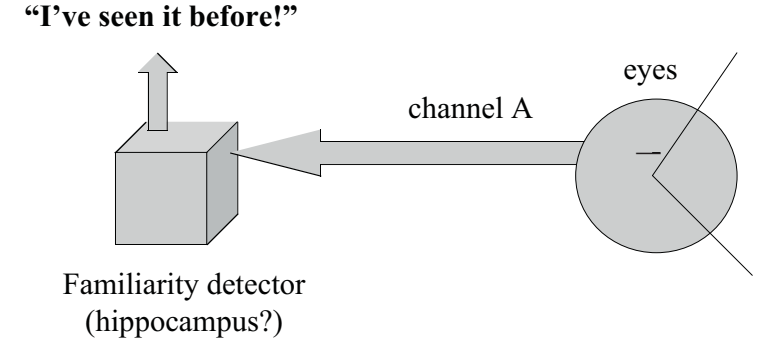


Figure 2. Simplified modell for *déjŕ vu*

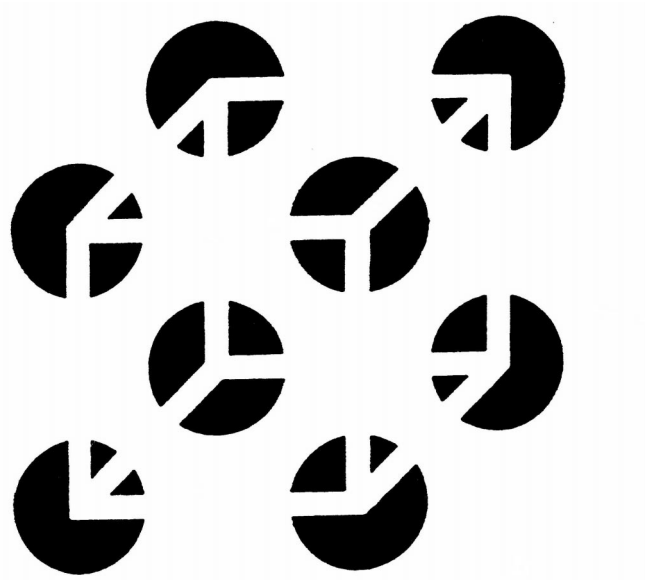
rate in whatever way they are supposed to elaborate in the other model. The main point to consider is that "from the inside", from the first-person point of view, the two models are indistinguishable. Nothing you can note about how *déjŕ vu* feels or seems to you could distinguish between the two models. If one of them (or some third or fourth model) is the truth, this will have to be established by third-person investigations of the neural machinery in your head. We will have to go backstage to explain this particular bit of stage magic.

Another startling effect is the "filling in" we can think we discover in our own visual experience. The first time I spied BELLOTTO's view of Dresden (see *Fig. 3*) on a distant wall in the North Carolina Museum of Art in Raleigh, I took it for a Canaletto, and eagerly approached it, expecting to enjoy, up close, the exquisite detail that Canaletto lavished on his Venice ships and gondolas, right down to the rigging lines, the buckles on the shoes, the plumes in the hats. The assorted crowd of people moving across the Dresden bridge in the sunlight promised a feast of costumes and carriages, but as I got closer, the details I could have sworn I had seen from afar evaporated before my eyes. Nothing but artfully placed simple blobs of paint were there to be seen up close.

Those spots "suggest" people, with arms and legs and clothes, and my brain had *taken the suggestion*. But what does that mean? What had my brain done? Sent out a team of homuncular brain-artists to sketch in faces, hands and feet, hats and coats, in the appropriate parts of some retinotopic maps? This is an empirical question, and it is not one that I could answer from my putatively privileged perspective as the subject of this remarkable experience. Almost certainly, nothing of the kind hap-

Figure 3. BELLOTTO's View of Dresden

Figures 4 and *5*. Closeups of BELLOTTO's View of Dresden



Figures 6. Ambiguous figure (after BRADLEY, PETRIE and DUMAIS)

pened in my brain. There is every reason to believe that no further *pictorial rendering* was done by the brain. When the brain *takes* the suggestion, the brain is forming a belief or expectation, not painting a picture for itself to look at. That expectation was exposed when it was violated, provoking a gasp of surprise from me; I had been expecting confirmation and elaboration of some speculative (involuntary, unconscious) hypotheses about what I would soon see, and this expectation was abruptly thwarted.

It was not *pure* hallucination or post-hypnotic suggestion; BELLOTTO did provide some dabs of paint for me to see, counting on my suggestibility to finish the job. The effect achieved is thus actually rather like one of the disqualified methods of performing the Indian Rope Trick: the post-hypnotic suggestion, or the reporter taking a bribe, but not a complete fake since there was some visual presentation. As in stage magic, there are different ways of achieving similar effects. Consider the "filling in" done by the brain in interpreting the multiple ambiguities of this figure of BRADLEY, PETRIE and DUMAIS!

In short, like a stage magician, the brain cheats! Many people, I have discovered, react to this suggestion with outraged disbelief: "Not *my* brain!" An understandable loyalty, but unwarranted and ungrounded. This is precisely what you *do not* know from personal ("first-person") experience. As SIEGEL says,

> Magic reveals how wrongly we remember what we have seen, discloses the way in which memory is the bearing and nursing mother of illusion. Memory is the magician's assistant, confederate, and shill. Hearing the description of a trick I've done, I'm amazed at what's described, at the way in which memory has tricked the spectator far more audaciously than I. (p. 438)

It is fruitful to consider the task of cognitive neuroscience as reverse engineering the magic show. To that end, what needs to be explained is what the audience *thinks* happened on stage. The perspective that catalogues this manifold of beliefs, true and false, gullible and shrewd, is what I call *heterophenomenology* (DENNETT 1982, 1991):

> In this chapter we have developed a *neutral* method for investigating and describing phenomenology. It involves extracting and purifying *texts* from (apparently) speaking *subjects*, and using those texts to generate a theorist's fiction, the subject's *heterophenomenological world*. This fictional world is populated with all the images, events, sounds, smells, hunches, presentiments, and feelings that the subject (apparently) sincerely believes to exist in his or her (or its) stream of consciousness. Maximally extended, it is a neutral portrayal of exactly *what it is like to be* that subject – in the subject's own terms, given the best interpretation we can muster. People undoubtedly do believe that they have mental images, pains, perceptual experiences, and all the rest, and *these* facts – the facts about what people believe, and report when they express their beliefs – are phenomena any scientific theory of the mind must account for. (*Consciousness Explained,* p. 98)

There is nothing revolutionary or novel about heterophenomenology; it has been practiced, with varying degrees of punctiliousness about its presuppositions and prohibitions, for a hundred years or so, in the various branches of experimental psychology, psychophysics, neurophysiology, and today's cognitive neuroscience. I just gave it a name and got particularly self-conscious about identifying and motivating its enabling assumptions.

There seems at first to be one residual problem with the heterophenomenological method: by taking the subject's word as constitutive, it seems to leave intact the one most problematic element of all – the audience watching the magic show. And as I have argued at length, this imagined showcase, the Cartesian Theater, where everything comes together for consciousness, must be dismantled. All the work done by the imagined homunculus in the Cartesian Theater must be distributed around to various lesser agencies in the brain. Whenever that step is taken, however, the Subject vanishes, replaced by mindless bits of machinery unconsciously executing their tasks. Can this be the right direction for a theory of consciousness to take?

Here opinion is strikingly divided. On the one hand, there are those who join me in recognizing that *if you leave the Subject in your theory, you have not yet begun!*

A good theory of consciousness *should* make a conscious mind look like an abandoned factory, full of humming machinery and nobody home to supervise it, or enjoy it, or witness it.

Some people hate this idea. JERRY FODOR, for instance:

> If, in short, there is a community of computers living in my head, there had also better be somebody who is in charge; and, by God, it had better be me. (FODOR 1998, p. 207)

As so often before, Fodor makes the valuable contribution here of exposing and endorsing the very idea that is causing all the trouble. He is far from alone in his anxiety about the loss of self portended by the dismantling of the Cartesian Theater, but he stands alone in his ability to articulate the misguided fear clearly and humorously. Robert Wright puts a different emphasis on much the same worry:

> Of course the problem here is with the claim that consciousness is 'identical' to physical brain states. The more Dennett et al. try to explain to me what they mean by this, the more convinced I become that what they really mean is that consciousness does not exist. (WRIGHT 2000, fn. 14, ch. 21)

Recall SIEGEL's wry comment on "real" magic.

> "I'm writing a book on magic", I explain, and I'm asked, "Real magic?" By *real magic* people mean miracles, thaumaturgical acts, and supernatural powers. "No", I answer: "Conjuring tricks, not real magic". *Real magic,* in other words, refers to the magic that is not real, while the magic that is real, that can actually be done, is *not real magic.* (p. 425)

Real consciousness, WRIGHT cannot help but thinking, is something other than – and more marvelous than – physical brain states. "Stage" consciousness – the sort of consciousness that can be engineered out of the activities of brain machinery – is not real consciousness. The insistence that consciousness *must* turn out to be something inexplicable, irreducible, transcendent sometimes rises to a fever pitch, as for instance in VOORHEES:

> Daniel Dennett is the Devil... There is no internal witness, no central recognizer of meaning, and no self other than an abstract 'Center of Narrative Gravity' which is itself nothing but a convenient fiction... For Dennett, it is not a case of the Emperor having no clothes. It is rather that the clothes have no Emperor. (VOORHEES 2000, pp. 55–56)

But that is the beauty of it! In a proper theory of consciousness, the Emperor is not just deposed, but exposed, shown to be a cunning conspiracy of lesser operatives

whose activities jointly account for the "miraculous" powers of the Emperor. Banished along with the Emperor are what might be called the Imperial Properties: the two most mysterious varieties being the Qualia Enjoyed by the Emperor and the Imperial Edicts of Conscious Will.

For those who find this road to progress simply unacceptable, there is a convenient champion of the alternative option: *If you DO NOT leave the Subject in your theory, you are evading the main issue!* This is what DAVID CHALMERS (1996) calls the Hard Problem, and he argues that any theory that merely explains all the functional interdependencies, all the backstage machinery, all the wires and pulleys, the smoke and mirrors, has solved the Easy Problems of Consciousness, but left the Hard Problem untackled. There is no way to nudge these two alternative positions closer to each other; there are no compromises available. One side or the other is flat wrong. I have tried to show that however compelling the intuition may be that we must not break up the conscious Subject into lots of parts that are not, themselves, conscious, this intuition must be abandoned. The tempting idea that there is a Hard Problem is simply a mistake. I cannot prove this. Or, better, even if I can prove this, my proof will surely fall on deaf ears, since CHALMERS, for instance, has already acknowledged that arguments against his convictions on this score are powerless to dislodge his intuition, which is beyond rational support. So I will not make the tactical error of trying to dislodge with rational argument a conviction that is beyond reason. That would be wasting everybody's time, apparently. Instead, I will offer up what I hope is a disturbing parallel from the world of card magic: The Tuned Deck.

> For many years, Mr. Ralph Hull, the famous card wizard from Crooksville, Ohio, has completely bewildered not only the general public, but also amateur conjurors, card connoisseurs and professional magicians with the series of card tricks which he is pleased to call 'The Tuned Deck' ... (JOHN NORTHERN HILLIARD, *Card Magic*)

Ralph Hull's trick looks and sounds roughly like this:

> Boys, I have a new trick to show you. It's called 'The Tuned Deck'. This deck of cards is magically tuned [Hull holds the deck to his ear and riffles the cards, listening carefully to the buzz of the cards]. By their finely tuned vibrations, I can *hear* and *feel* the location of any card. Pick a card, any card... [The deck is then fanned or otherwise offered for the audience, and a card is taken by a spectator, noted, and returned to the deck by one route or another.] Now I listen to the Tuned Deck, and what does it tell me? I hear the telltale vibrations, ... [buzz, buzz, the cards are riffled by Hull's ear and various manipulations and rituals are enacted, after which, with a flourish, the spectator's card is presented].

Hull would perform the trick over and over for the benefit of his select audience of fellow magicians, challenging them to figure it out. Nobody ever did. Magicians

offered to buy the trick from him but he would not sell it. Late in his life he gave his account to his friend, HILLIARD, who published the account in his privately printed book. Here is what Hull had to say about his trick:

> For years I have performed this effect and have shown it to magicians and amateurs by the hundred and, to the very best of my knowledge, not one of them ever figured out the secret. ...*the boys have all looked for something too hard* [my italics, DCD].

Like much great magic, the trick is over before you even realize the trick has begun. The trick, in its entirety, is in the name of the trick, "The Tuned Deck", and more specifically, in one word – "The"! As soon as Hull had announced his new trick and given its name to his eager audience, the trick was over. Having set up his audience in this simple way, and having passed the time with some obviously phony and misdirecting chatter about vibrations and buzz-buzz-buzz, Hull would do a relatively simple and familiar card presentation trick of type A (at this point I will draw the traditional curtain of secrecy; the further mechanical details of legerdemain, as you will see, do not matter). His audience, savvy magicians, would see that he might possibly be performing a type A trick, a hypothesis they could test by being stubborn and uncooperative spectators in a way that would thwart any attempt at a type A trick. When they then adopted the appropriate recalcitrance to test the hypothesis, Hull would "repeat" the trick, this time executing a type B card presentation trick. The spectators would then huddle and compare notes: might he be doing a type B trick? They test *that* hypothesis by adopting the recalcitrance appropriate to preventing a type B trick and still he does "the" trick – using method C, of course. When they test the hypothesis that he's pulling a type C trick on them, he switches to method D – or perhaps he goes back to method A or B, since his audience has "refuted" the hypothesis that he's using method A or B. And so it would go, for dozens of repetitions, with Hull staying one step ahead of his hypothesis-testers, exploiting his realization that he could always do *some trick or other* from the pool of tricks they all knew, and concealing the fact that he was doing a grab bag of different tricks by the simple expedient of the definite article: *The* Tuned Deck.

> ...each time it is performed, the routine is such that one or more ideas in the back of the spectator's head is exploded, and sooner or later he will invariably give up any further attempt to solve the mystery. (HULL, as quoted in Hilliard)

I am suggesting, then, that DAVID CHALMERS has (unintentionally) perpetrated the same feat of conceptual sleight-of-hand in declaring to the world that he has discovered "The Hard Problem". Is there *really* a Hard Problem? Or is what appears to be the Hard Problem simply the large bag of tricks that constitute what CHALMERS calls the Easy Problems of Consciousness? These all have mundane explanations, requir-

ing no revolutions in physics, no emergent novelties. They succumb, with much effort, to the standard methods of cognitive science. I cannot prove that there is no Hard Problem, and CHALMERS cannot prove that there is. He can appeal to your intuitions, but this is not a sound basis on which to found a science of consciousness. We have seen in the past – and I have given a few simple examples here – that we have a powerful tendency to inflate our inventory of "known effects" of consciousness, so we must be alert to the possibility that we are being victimized by an error of arithmetic, in effect, when we take ourselves to have added up all the Easy Problems and discovered a residue unaccounted for. That residue may already have been accommodated, without our realizing it, in the set of mundane phenomena for which we already have explanations – or at least unmysterious paths of explanation still to be explored.

The "magic" of consciousness, like stage magic, defies explanation only so long as we take it at face value. Once we appreciate all the non-mysterious ways in which the brain can create benign "user-illusions", we can begin to imagine how the brain creates consciousness.

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