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Interview with Daniel Dennett conducted by Bill Uzgalis in Boston, Massachusetts on December 29, 2004

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Abstract A taped conversational interview with Daniel Dennett and Bill Uzgalis covers a wide range of topics arising from Dennett's thoughts about computing and human beings. The background of Dennett's work is explored as are his views about mind-brain identity theory, artificial intelligence, functionalism, human exceptionalism, animal culture, language, pain, freedom and determinism, and quality of life.

Keywords Artificial intelligence · Dennett · Freedom · Functionalism · Mind-brain identity · Qualia

Editor's note: Daniel Dennett accepted the 2003 Barwise Prize at the Eastern American Philosophical Association meeting in Boston on December 29, 2004. He gave an address at a special session, following which Bill Uzgalis (Oregon State University) conducted an interview with Dennett with the intent to focus on aspects of his work related to philosophy and computing issues. Uzgalis taped the interview, transcribed it, and shared the result with Dennett who suggested some revisions. Dennett has given many interviews, some on national television and in popular publications. The following dialogue is the most informed and insightful of the interviews with Dennett that this editor has read. I am confident that this text will serve as an important source in future studies of Dennett's philosophy.

Uzgalis: Daniel Dennett, you are the recipient of the American Philosophical Association's Barwise Prize for lifetime achievement in Computing and Philosophy for 2003.
Dennett: Indeed I am.
Uzgalis: Clearly this means that the APA committee that awarded the prize recognized a broad range of achievements through a long span of time. So, let's try and go through some

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of those areas. You were talking earlier in your Barwise lecture about software development for classes and I know you got into this very early. How did that happen?

Dennett: Well, I don't know if I got into software development early. What happened was I was teaching a course in introductory computer science as part of a team at Tufts in the early 80's. And two of us, George Smith and I, saw the opportunity to create software for use at university level courses that would open up pedagogical bottlenecks where students had a hard time understanding difficult material. We could make an artifact that would open up that space for them and help them imagine that in much more detail. So with Steve Barney's brilliant help we did a computer, a visible computer, you could watch it work, so you could really understand how computers work. We did Gene Wright [named in honor of Sewall Wright, the great population geneticist], which is a population genetics program, which is available still. This is a wonderful way of looking at population genetics with the help of a computer

Uzgalis: Now this was for other folks, right?

Dennett: Yeah. None of this had anything to do with philosophy, really. Both of us are philosophers. In one way it has to do with philosophy because it has to do with how to get people to imagine things they're not used to imagining. We did prototypes in statistics, in geology, in neuroscience, neuroanatomy, and others. It was a labor of love; it was wonderful work. I'm very proud of the stuff that we did and its fall-out in subsequent years. I wasn't writing the programs myself, neither was George. We were the midwives, we were the ones who would harness the talents of bright young student programmers and make sure that the content was completely on the level and that the basic design, the pedagogy, was sound.

Uzgalis: You've already mentioned the theme of your Barwise Lecture, which is that computers aid the imagination in the way that telescopes and microscopes aid the eyes. When did you discover that and expand that vision to philosophy?

Dennett: Well, I think I discovered the imagination-expanding power of computers back when I was a graduate student, when Alan Anderson's little anthology *Minds and Machines* came out with some classic papers in it. I devoured that and really got interested, talked to Anderson a bit, got interested in artificial intelligence, appreciated right off that this was another way of doing philosophy. Artificial intelligence always has been, I think, a sort of philosophy done with the aid of computers. Artificial intelligence programs are thought experiments. People in the field have often been uncertain exactly what to say that they've been doing. Are they modeling real phenomena? What's the difference between computational neuroscience and artificial intelligence? The answer is, AI is more like a thought experiment. It's addressing a variation on a Kantian theme, actually. That is, the theme of how could anything possibly have experience, how could anything possibly be intelligent? You don't want to restrict yourself to *Homo sapiens* or Earthlings or any physical thing at all. How could it be intelligent? And what are the necessary ingredients? So there is actually an aprioristic turn to it because it's an attempt to analyze the very idea of intelligence and see what something would have to be and be able to do to count as intelligent. And then, don't just waffle on about it, but actually make one of those things and prove that it is intelligent or not.

Uzgalis: That was an insight that came to you early on?

Dennett: Back about 1963, yes.

Uzgalis: You continued to follow that line?

Dennett: Yeah, I was very fortunate. I went to Irvine, my first job in '65, which had a few good AI people in it—there weren't that many in the world then—but several of them, Julian Feldman and Fred Tonge, in particular, were actually at Irvine. And they took me under their wing and taught me a lot and introduced me to Allen Newell and other people in the field, and Feldman was the coeditor of the famous Feigenbaum and Feldman *Computers and Thought* anthology. So that put me in touch with all those people. And one day Feldman came to my office in a stew, and said, ''What do you make of this?'' And he threw down on my desk a preprint of a memo from the RAND Corp. by Hubert Dreyfus, called ''Alchemy and Artificial Intelligence,'' which was basically the backbone of his famous book, *What Computers Can't Do*. He said, ''What do you make of this?'' I read through it and said, ''Well it's clever but it's wrong, I think.'' ''Say why, say why.'' And so I was enlisted in 1966 by the AI community as a sort of rebutter or refuter of Dreyfus right from the get-go. And in fact my first publication was in the journal *Behavioral Science*, in the Computers and Behavioral Science section: ''Machine Traces and Protocol Statements.'' It was a critique of the RAND memo of Dreyfus, saying where he went off base and what was wrong with his critique. Now there were many things that were actually right about what Bert had to say, but he made what I consider a fundamental philosophical mistake of inflating claims about difficulty into claims about impossibility. He was utterly right about what the hard problems were and about how a lot of the work in AI was on the wrong problems, was on problems that were impressive in one regard but were easy from the point of view of AI, whereas the hard ones were about tying your shoes and getting about in the world, not playing chess or answering questions about baseball. He overstated the case and the overstatement was what drew the ire and fire of the people in AI. So over the years I've always agreed with Bert about a lot of his diagnoses of the shortcomings and foibles of AI but not about his grand diagnosis that AI is flat impossible. No, it's just hard, and harder than the people in the field think, absolutely true, but not impossible.

Uzgalis: At some point in that history, you went to England and studied with Gilbert Ryle.

Dennett: That was before that. I did my graduate with Gilbert Ryle back in '63–65, but at that point I had never touched a computer. I had nothing to do with computers until I got to Irvine, I mean I had read about them, but I had never touched a computer or tried to write a program, anything of the sort until '65. Of course back then, computers were in large, air-conditioned rooms. It wasn't as if computers were on every desk. You had to go to some trouble to touch computers back in those days.

Uzgalis: Did Hilary Putnam's work influence you?

Dennett: Yes, indeed. While I was a graduate student, back in the sixties, I read his classic ''Minds and Machines'' paper, which I thought was brilliant and a real changer of the nature of the game. So I began writing my dissertation using that paper as a central pivot point and he kept writing more papers. There was a whole series of those papers. And no sooner would I have extrapolated his position into a little new territory, feeling very good about that, then the next paper would arrive and he would've gone that far and farther. So I was trying to play catch-up with him. Those were, I think, the most important papers. That and Jack Smart's ''Sensations and Brain Processes.'' Those were the most important papers in philosophy of mind. Not just in the 60s, I think they were the most important papers in the century because they really did open up new territory. So I did my best to put my take on those papers and build on them. That was in my dissertation, which eventually turned into *Content and Consciousness*.

Uzgalis: The Smart paper sets forth the mind-brain identity theory.

Dennett: That's right, and it has the lovely idea of topic-neutral sentences in it, the idea that you can make a machine that can answer the question ''I know this is like that, but I don't know in what regard. I just know they're alike.'' Jack Smart did that without any particular knowledge about computers, but it was a sure-footed insight into how computers do things. They have competences that they don't have to understand. And that's the way to make progress on the mind. You have to make a mind out of things that have mind-like competences that they don't understand, because they're just simple material things. So, the idea of making a whole mind out of quasi-, pseudo-, proto-, semi-, hemi-, demi-, pseudo-minds—the fundamental insight of cognitive science is that by going through a series of levels you can get mere mechanical matter, as in Leibniz's mill, to do the work of an intelligent mind, with comprehension and consciousness in a material thing.

Uzgalis: I take it that of those two strands—the Putnam strand and the mind-brain identity theory, that you've rejected the mind-brain identity theory?

Dennett: I did for roundabout reasons, but it was a central part to what I was up to at the time. The first chapter of *Content of Consciousness* is about physicalism without identity theory. And mainly what it's saying is that the things on the left and right of the equals sign are not of the same type. It's not that identity theory is so much false, as it has the wrong end of the stick. Yes we want to be physicalists, yes we want to be materialists, but there are more ways of doing that than by lining up mental candidates on the left-hand side of the equation and physical candidates on the right-hand side of the equation and saying, ''this equals that.'' Now, the birth of that idea was already in Jack Smart's paper. It's not that the after-image is identical with something in the brain, it's the *having of the after-image* that's identical with something in the brain. So, you don't take the mental phenomenon apart and say, ''now, which brain process is the left-hand corner of the after-image and which brain process is the right-hand corner of the after-image.'' That's already to be naïve. Yes, everything that's true about this thing you say in the mental language is true in virtue of something you say in the physical language. But the mapping between the mental and physical language is not going to be straightforward, it's not going to be one-to-one. There's going to be situations on the mental side of the equation which are identical with situations on the right hand side, and that's all you need. Well, this is an idea that has more recently been endlessly written about in terms of supervenience, but the basic idea was there in Smart and I pushed it a little further. I said, ''Look, by the time you've said it's not the after-image I'm identifying and it's not the having of the after image I'm identifying, it's the total *situation* of there being a person who is currently having an after-image of type such-and-such—it's that whole situation that is identified with the person's body being in such-and-such a state,'' the initial point of the identity theory is gone—the initial point being to take the categories that you find in nature and say: ''Oh I see, it's one of those.'' It's not that simple. You don't point to whole situations, you point to after-images, but when you do that you don't find anything on the right-hand side to identify with.

Uzgalis: Functionalism has at its core an analogy between minds and computers as the title to Putnam's original paper suggests. It was doing all kinds of things that took the best parts of other theories, and answered questions other theories couldn't answer. Dualism, for example talks about causal interaction. Behaviorists rejected this notion in favor of talking about the logical relation between inputs and outputs. Functionalists had the insight that you had a causal stream between inputs and outputs and yet you could also talk about the relation between inputs and outputs as a logical relationship. It also solved a notorious problem with behaviorism by allowing other mental states as well as the relation between inputs and outputs to define a particular mental state. Functionalism also allowed for multiple-realizability and thus solved problems that the mind brain identity theory had difficulties with. All of these points were developed from analogies between computers and minds. When you consider all the problems it could solve this was an impressive

achievement that seemed to make it the best available theory of mind we had. Then along came the problem of qualia. How did that come to you and how did you react to it when you heard it?
Dennett: Well, of course, I already thought I'd dealt with it in *Content and Consciousness*; basically by saying that qualia is a trap that philosophers have gotten themselves into and there really aren't such things. What we have to explain is why people think there are. That became more outspoken when I did ''Quining Qualia,'' which was in the 80s. But in *Brainstorms* I had ''Two approaches to mental images'' and ''Why you can't make a computer that feels pain'' that were pushing a functionalist line and showing how to deal with qualia. Well, over the years, I've always underestimated just how potent the lure of qualia are. It is one of these fatal attractions to philosophers. They find a path to the idea of qualia and then they won't let go of it. These paths are all mistaken—of course there are pains and subjective colors, but they're not what philosophers think they are. So I've doggedly fought this battle to show people that the idea of qualia is incoherent. There are neighboring ideas that aren't incoherent and that aren't any problem for functionalism; in fact, the only way to make any sense of them is through functionalism. So, I've argued all along that the phenomena that are misgathered under the rubric of ''qualia'' make beautiful sense in functionalism and only in functionalism and that any other approach to them—the idea that qualia are the stumbling-block of functionalism—that is itself just a huge mistake and a perennial mistake.
For instance, in *Consciousness Explained*, to alert people to what was at stake, I made a sort of joke about *figment*—figment was like pigment, figment was what qualia were made of. I pointed out that either what you're saying is there really is something like figment or you have to admit that your view of qualia fits into functionalism just fine. What I've found over the years is that there are a lot of people who want to say there's figment! And what I viewed as a reductio, that's what they don't want to give up. And, you know, there's not much you can do when you've run your reductio and they've just embraced the conclusion. Then you realize that you really do have a deep-seated attraction that's not going to resist argument.
David Chalmers and I have discussed this for what seems an indeterminable number of years, and he candidly grants that he has no arguments in favor of qualia that I haven't rebutted to his satisfaction, he just can't let go of the belief in them. Okay, I'll take him at his word; I won't bother trying to argue with him anymore. I can suggest therapy, maybe, because he says that it's not a rationally grounded belief on his part, it's just a gut intuition that he can't escape. I say, all right, maybe if he changes his diet or something, I don't know.
Uzgalis: Let me take another turn. At some point, in the late 70s or early 80s, Jerry Fodor published his book, *The Language of Thought*.
Dennett: 1975, actually.
Uzgalis: And that was an expression of strong AI.
Dennett: Not really. Jerry wouldn't let you say that. One of the things that puzzled me for years was how Jerry could write the *Language of Thought* and be an ardent, defining proponent of the language of thought hypothesis and not be interested in strong AI. But he never was; he always was opposed to it, which is really perplexing when you think about it. How can he not be interested particularly in Good-Old-Fashioned AI, which was the attempt really to describe the language of thought—to work it out? Beliefs were sentences in the head and they were Lisp expressions or something similar, or if you look at a computer language like Prolog—that's it, that's supposed to be the language of thought!

And Jerry, from the outset, expressed no interest or enthusiasm about any of this. So, what on earth was going on? It's an interesting question. He didn't want to pursue that avenue—it's still an interesting question of ''Why not?''

Uzgalis: The thought I was going down was that, as you said, the language of thought hypothesis is that underlying sentences is activity in the brain that corresponds to it. And, at least some folks, like the Churchlands, have just rejected that view altogether. You seem to hold a kind of middle position.

Dennett: Yeah, first of all I certainly would join in dismissing any simplistic language of thought hypothesis, which supposes that the sentences are like written sentences in the natural language—that they have subjects and predicates and a linear structure. That thesis is, I think, bizarrely unrealistic, but now start tempering that thesis and modulating it. Once a sentence in the language of thought doesn't have to be linear—it can be multidimensional—and can have variables instead of adjectives and doesn't have compositional grammar, but has some other way—though it does have to be compositional in some way—but it doesn't have a syntax, well now what you're saying is—doesn't there have to be a *system* of representation? And I think that's true. But then it's not clear that the Churchlands don't believe that too. So, the question is ''What kinds of systems of representation do we have in the brain?'' is still a frustratingly unanswered question. People have been nibbling away at this for 40 years and we've only ruled out the most simple-minded versions, but there's plenty that we haven't properly tested because we haven't properly formulated them.

Uzgalis: Part of this debate has gone on in terms of computer models, yes?

Dennett: Oh yes, and for a very good reason—without the computer we wouldn't know how to take these ideas seriously. With the computer we now do have a general confidence in our ability to model tremendously intricate, convoluted, and multi-variable phenomena in a formal way. And in this vast space of possibility, we don't know what the biologically plausible ones are and we don't know what the really powerful ones are. For some people, it looks as if you have this huge database of fundamentally inert data-structures and then you have an inference engine that chugs along, maintaining order and consistency and generating further implications. That's ''GOFAI,'' Good Old-Fashioned AI, and it has many virtues. First of all, at least little bits of it you can actually do. There are models that actually do the work. You know that the proofs work. You know that they generate inferences that they can actually accomplish. And that's not nothing. That's inference-engines replacing human thinkers in some pretty impressive domains. That gives us an existence proof that it's possible to order mechanical systems so that they do serious inference, meaning inference in the broadest sense—transition from one state to another where the information gets put in a new form where it's more useful for current purposes, say. On many fronts, we've learned how to manipulate representations and extract information from them, and a lot of it isn't really AI, it's computer graphics or automated map analysis or data analysis of every imaginable sort.

Out of that work a growing arsenal of tools is being developed, which are the right sort of tools to do this sort of work of intelligence. How to put them together—we've got all these interesting new competences embodied in tissues we've learned to make, but the larger architecture is still eluding us. It's as if you want to build an airplane—a flying machine. If you try to build it out of bricks and mortar—that's going to be difficult. If you get aluminum, that's pretty good, it's in the right direction and it's a material that has a lot of the properties you're going to need but it's not an airplane, it's just a piece of aluminum. We've got a lot of nice fabrics now, we've got great connectionist fabrics, pattern recognition fabrics, little inference engine fabrics, we've got data structures which have the right sorts of addressability conditions, we've got memories with very nice properties, they degrade gracefully, they permit learning. We've got all kinds of chunks and bits of vision systems and auditory analysis systems and behavioral control systems, feedback loops. We've got a huge warehouse of gear and now we need to put it all together.

Uzgalis: It seems to me that as the field of AI has developed—you started out with things like theorem proving and chess playing, and now people are talking much more about action, dynamic systems—is that what this collection of stuff is building towards?

Dennett: This goes back to one of Burt Dreyfus' correct assertions, namely that embodied agents that have to deal with complexities of the real world in real time set challenges which are ill-addressed by the walking-encyclopedia models that AI was developing from the top down. Let me tell a little autobiographical bit: Zenon Pylyshyn, one of the wonderful early theorists of cognitive science, wrote a piece for *Behavioral and Brain Sciences* about AI, its strengths and weaknesses. In my commentary I said, ''Here's another approach entirely. Instead of trying to model some isolated human microcompetence like playing chess or answering questions about moon rocks, try to model a whole human organism, but get your simplicity by making it a simple organism. How simple? Bacteria? No. Starfish? You can go a little higher than that, one hopes. But it doesn't have to be real, it could be a three-wheeled Martian iguana, but it has to fend for itself in real-time, it has to deal with its actual problems but otherwise it can be as unlike us as you like, and it's just an interesting challenge. That piece was called, ''Why Not the Whole Iguana?'' You do the whole agent, not just parts, and get your simplicity by making it simpler and simpler and simpler, until you have a simple enough agent that you can do the whole thing. Well, in fact, that two-page commentary sparked a lot of imaginations and around the world various people said, ''Right, let's build the whole iguana.''

Uzgalis: Rodney Brooks?

Dennett: Rod Brooks and his insects was one example, but there were actually quite a few others. So many good ones that we had a conference in the Canary Islands a few years ago called, ''Towards the Whole Iguana'' and we had people from around the world who, in their different ways, were trying to make whole iguanas—robots that could survive in their limited toy worlds and actually accomplish in real-time the sorts of things that one has to accomplish. The basic insight of it is supposedly that every creature, from the most mandarin chess-playing philosopher/astronomer to the cockroach, has got to get through life moment to moment and its got to have an architecture that permits it to preserve itself and maybe have a little spare time over for doing deep thinking. Let's find out what that architecture is and then build any deep thinking on top of that and it'll probably take advantage of a lot of the competence it has for getting through life simply in order to understand the fancy things it's thinking about too. This is very much the embodied approach. It might be wrong. It might be that you can actually get an adroit, sympathetic, high-level conscious understanding in an entity which has no body and doesn't worry about getting fed at all, doesn't worry about predators, it just lives completely bed-ridden as a sort of super-intelligence. But, very few people, I think, believe that.

Uzgalis: Let me pick up another stream. I talked to a couple of my colleagues about you, and they remarked that amongst the most important things that they thought you had done was the idea of the intentional stance. And it seems to tie in with what we were just talking about, because I guess part of the idea is that you can have different hierarchies of machines with different properties so that, too, ties in with computers, yes?

Dennett: Oh, yes. The basic idea here was to recognize that there were different perspectives that you can adopt to something complicated. You could treat it just as a physical object obeying the laws of physics. You could treat it as an artifact of some sort, something that was designed, which means that you can use means/ends analysis. You can use optimality models, you can think of this as not just matter in motion but as things which have functions. You can be a functionalist. Then there's a higher stance still. Higher in the sense of more abstract, less committed to the details, and taking on an even riskier assumption: mainly, that the designed thing has been designed to extract information from the world and use it to improve its ends, whatever they are. So it has beliefs, desires, and it's rational. Once you look at it that way, you realize that that perspective is the perspective of folk psychology; it is the perspective of mentalism. But my contribution was to say, notice that this mentalism isn't *anthropomorphism* so much as it's *rational-agentism*, and it's an engineering simplification. It can be a short-cut way of getting a grip on the complexities of a very complex thing by presupposing that this complex thing is a rational agent with beliefs and desires. Of course, my favorite example is the chess-playing computer. You don't have to know what the program is, you don't have to know what the implementation is, if you just know it's a chess-playing computer, you can predict its moves like a bandit. You can predict that if you leave an unguarded bishop over there, it will be snatched up at the first opportunity because that's the best move going and it's going to see that. This is tremendous predictive leverage, but nothing's for free—the price you pay for this is taking on assumptions that could be false if it's not as rational as you think it is. But this simplifying move is undeniable, and in fact it's used by chess playing computers. How do chess playing computers work? When they're doing the game tree, when they're trying to look ahead, they eliminate the stupid moves that the opponent would make, and they don't bother checking out the paths of the responses that are really stupid, and this is risky. Because maybe a move that they think is stupid is, at some deeper level, smart. Or maybe it's just plain stupid but in any case it takes the opponent into a different part of search space, one that they haven't investigated. And once you start looking, you see this strategy of adopting the intentional stance everywhere in nature, and we're just a very extreme case of this when we're folk psychologists, when we become higher-order intentional systems who attribute to others beliefs and desires—it's not just that there are beliefs and desires that we attribute to others. We have beliefs and desires about the beliefs and desires of others and we have beliefs and desires about the beliefs and desires about the beliefs and desires, and so forth. And it's this iteration, this recursion on the fundamental strategy, that makes us the complicated minds that we are.

Galas: If we go back to Descartes, he thought that there was a huge metaphysical gulf between human beings and other creatures in nature. The result of a couple of hundred years of investigating nature and human beings is that we've come to the conclusion that the line is much blurrier. You can find different human capacities out there in nature, but it seems like we have a particular bundle that is unique.

Dennett: Yeah, I think that the level of anxiety about human specialness–exceptionalism—is curious, as if there had to be one simple answer to this. Yeah, yeah, we're mammals and what's true of mammals is true of us and we're not that special in any way, and then there are some things that are really unique about us. Exceptionalism is true in some regards and false in others. The main thing is to realize that it's not at its basis a fundamental divide in nature. It's not that one species has an immaterial and eternal soul and the rest don't. No, it's just in virtue of a particular set, a convergence, of competences that distinguish us from other species. But once that distinction is there, it takes off and it becomes explosively different. So I think we really are explosively different from other

species, not metaphysically, but in terms of what makes our minds. It's what makes us moral agents and not just moral patients. What makes ''creatures with free will'' a real and interesting problem, is that we are capable of so much more than other organisms.
Uzgalis: Take the traditional philosophical distinctions—rationality, ethics, culture—and it's turning out that those lines are somewhat blurred too. If you take culture, for example, primatologists are now arguing that apes actually have culture.
Dennett: Oh yeah, sure they do. But as is usual in biology, these things are not absolute bright lines, but nevertheless these things are step functions. Animals have culture. Avital and Jablonka's *Animal Tradition* is a lovely book on this, Bonner has a nice book on this, *The Evolution of Culture in Animals*, I think is the title.
Uzgalis: Yes, Franz De Waal's book *The Ape and The Sushi Master...*
Dennett: Yes, there are other books on this, but that's like the difference between having a tin whistle and an orchestra. Yeah, they have a little bit of culture, but it doesn't go explosive, it doesn't build on itself the way ours does. There are a few items of cultural transmission. Maybe there are a hundred more that we haven't recognized, maybe two hundred. But we've got millions or billions of items of cultural transmission; no other species has that.
Uzgalis: Yes, I'm sure that's right. And I suppose that's again a function of this unique collection of capacities and powers.
Dennett: Yes, it's the generative power that makes all the difference.
Uzgalis: What are your views about language in this regard?
Dennett: I think language is at the heart of it. It is language that gives our minds their incredible power. I don't think there's anything even unobvious about this. Language is what gives our minds both certain sorts of discipline so that they can simply have habits of thought that are inaccessible to other creatures, and it gives us, of course, the compositionality to think thoughts that are just unthinkable without language and to transmit them so that we get to benefit from the discoveries of everybody else automatically. So it makes possible both the division of labor and the unification. You don't have to depend upon what you can learn in your own lifetime in your own personal experience.
Uzgalis: Underlying language, there must be a whole series of very strange powers and capacities again. The capacity to abstract and have concepts—
Dennett: Not so much to have concepts as to manipulate concepts. Does a polar bear have the concept of snow? Well my gosh, polar bears are pretty competent vis-a-vis snow. You might say that that in itself implies that they have concepts of snow, but I guess that they can't think about snow the way that we can, even if we've never seen snow. We need a whole new vocabulary to talk about concepts, schmoncepts, pseudo-concepts. I think the term ''concept'' is a pretty ramshackle theoretical concept.
Uzgalis: I'm thinking of things like perceptual concepts, where you look at a tree from one angle, or you look at a tree from another angle and somehow you can figure out that it's the same thing. That seems problematic.
Dennett: Yes, I agree. That's part of what's ramshackle about the concept of ''concept.'' For many purposes I think it's easy enough to say that a concept is just a word without its pronunciation. It's what ''*chaise*'' and ''chair'' and ''*Stuhl*'' have in common. It's the concept of a chair. It's not the word, it's the meaning that the words share. And that's not bad for getting us into an interesting territory of thought. But to try to elevate that to the level of ''atom'' or ''molecule,'' to treat it as a really good fundamental category—I think that's a mistake.
Uzgalis: So, do you think Kant is a little too insistent on that?

Dennett: Yes. I think Kant, like every other philosopher before the mid-20th Century has to work from a base of folk psychology only and is not going to get any help at all from the brain. There's just no other way of approaching these issues but from the folk psychological perspective. We've only begun developing other paths into these phenomena.
Uzgalis: If we go back for a second to talking about computers and the kind of organisms we are, you mentioned one of your *Brainstorm* essays about why computers can't feel pain. That seems like an enormously significant difference between biological organisms and artificial ones.
Dennett: That's why I like the title of that piece, because it's so ironic: people think that what I'm trying to show is that there's an enormous difference, and of course, what I'm trying to show is that there isn't. The whole point of the essay is to show that the only reason that computers can't feel pain is that the concept of pain is subtly incoherent, and, you know, we can't feel pain either, given the way pain is defined, and once we get clearer about the phenomenon of pain we'll see no problem making a robot that feels pain. And indeed, I think we're well on the way to giving COG a good pain system. So the problem is that it would've been criticized, ''That's not real pain,'' philosophers might say, and they would be able to make a pretty good case, because they could find some features that they said were somehow essential or definitional for pain that were missing, but you could add those, and when you add those you'd end up with a self-contradictory concept one way or another, but what they would fail to realize is that that concept is just as self-contradictory when applied to us. After all, much of that paper is concerned with showing how incoherent the everyday concept of pain is. Computers obviously can't exhibit any phenomenon that can't be coherently described.
Uzgalis: I suppose this is a general problem. When people say, ''Computers can't do this,'' often enough what you find is they can't say what ''this'' is in the first place.
Dennett: Yeah, and that's why it's such an easy and tempting thing to say—because you can hide behind the difficulties of definition and cling to your plausibility. And whenever people respond more constructively and spell out what it is that computers can't do, the very spelling-out pretty much guarantees that they can. It's a recipe for getting computers to do what you said they can't do.
Uzgalis: And I suppose that's one of the lovely things about the whole exercise.
Dennett: I think it is. I think computers call the bluff of philosophers wonderfully in these regards. You say the computer can't do X? Well, tell me more exactly what you mean by X. And once you've got it clear—and this is quite independent of the particular computer—just getting really clear what would count as something ''having the competence''—once you got really clear about that, I'll make you something that's got that competence.
Uzgalis: In my Introduction to Philosophy class, I often talk to my students about computers and free will (we've usually gone through the free will and determinism part—libertarianism and hard determinism and compatibilism—before we get to the philosophy of mind), and I say ''I'll bet you think computers don't have free will.'' And they'll say, ''Yeah, sure.'' ''Well,'' I tell them, ''think back through the various theories that we've talked about—libertarianism, hard determinism and compatibilism—if you take libertarianism—what you say is likely correct because it is a non-deterministic account of freedom. But libertarianism is a pretty crazy theory even about people. On the other hand, if you take compatibilism—it's a deterministic theory and computers are deterministic systems. So, as long as you can give a computer a desire, you can pretty easily conceive of it having freedom, in that compatibilist sense.''

Dennett: Sure, that's what I've argued in two books.
Uzgalis: So, that is generally the line that you want to go down?
Dennett: In *Elbow Room*, I gave the example of the robot babysitter, and said, ''You can have a deterministic or indeterministic one. They will otherwise have the same competences—these are your kids they're taking care of—you want them to be responsible, you want them to have freedom—is there any reason to prefer the one with the indeterministic—genuinely random—control structure as opposed to the pseudo-random one? The answer is ''No, none at all.'' If one's free, the other's free. The difference couldn't come from whether or not quantum indeterminism reigned, that's just not the right concept of freedom.
Uzgalis: I guess there is a regularity to freedom that that quantum notion just simply doesn't capture.
Dennett: It doesn't capture anything that you want in freedom. It's stunning how close to the surface the systematic futility of quantum physics as a source of the free will problem is, and people keep routinely forgetting this. If a decision is genuinely quantum mechanically random then it can't be your decision, in any interesting sense. You can't be responsible for it because it just happened. Now, I go into some length about this looking at Robert Kane's model—what's good about this model is it can be had in a deterministic variant and there's no reason to prefer his indeterministic variant over the deterministic one.
Uzgalis: Well, it seems like we've covered a whole range of topics here that are connected with computers, can you think of others that we've missed.
Dennett: I don't know, let's see. Well on a darker note I've written a bit about the way in which computer technology can make it harder to lead an interesting life by taking away some of the thrills and adventures that were otherwise possible. I'll start with something trivial and end with something not trivial at all. In my youth, I learned celestial navigation, how to use a sextant, how to compute HO214 method my position on the surface of the globe from a few sights and a good chronometer, and the nautical almanac, and I loved being able to do that. I dreamt of exploiting my hard-won knowledge someday sailing single-handed across the Atlantic in a sailboat and doing my own navigation. I could still do that today, but it would be foolish because for $150 you can take along a couple of GPS units which will do all of that for you to much greater accuracy than you can do on your own. And if you've got your boat insured, they won't let you go without taking these with you. Now, you can defy your insurance company and you can brave it, you can go out there, it's sort of like using fire by friction to light your campfire—if you really want to do it instead of using matches you can—but it's sort of weird, it'd be a historical curiosity today. All of that hard work that's taken from you. You can still sail across the Atlantic, it'd be pretty challenging, but part of that thrill is no longer available, practically.
But that's trivial, as I said. Let's apply it to medicine. Diagnosticians used to have really wonderful mental exercises of diagnostics where physicians using Sherlock Homes-like powers would figure out what little clues were available and they could make brilliant diagnoses and, add that to the bedside manner, there was the possibility to be an artful and creative and ingenious doctor—that's why a lot of people went into medicine. Nowadays, more and more, what the doctor does is simply plug you into one machine or another and wait for the results. The diagnostic skills are much less in use. Neuropsychology used to be stunning—the cleverness and ingenuity with which neuropsychologists could figure out from simply studying the symptomatology of the patient, running a few simple bedside tests on the patient, could say this patient has brain damage in this particular location of the

brain—it's on the left side, it's right here or there, not involved in this area, blah blah blah. And the surgeons would go in and sure enough that would be exactly where the problem was. Now, of course you just put them in the scanner and you find that out immediately. You don't have to have that diagnostic skill. Well, if occupations as swashbuckling, as intellectually-adventurous, as brain surgeon, neuropsychologist, and physician can be threatened with growing routinization and cutting down the role of human responsibility, then I think this is actually something to worry about. It reminds me of the doorman at a fancy apartment building—entirely ceremonial role—you don't really need a doorman. It's sort of nice, I suppose, when he says ''Good morning,'' and he holds the door, but you can have a door opener there, it'll work just fine and it'll have the cab called and even the security angles—it's becoming a sort of ostentatious affectation to pay a doorman, and it's not really a nice job. In the past, there was a time when the concierge had quite a lot of responsibility and could really be clever and would really be important and your life could depend on him in various ways, not any more. The role has been turned into largely ceremony. And that could happen to doctors; they could become medical doormen. The rich would have their personal physicians, the rest of us would just plug into the machine and get the diagnosis. We should look more closely at the ways in which our still-exploding-by-orders-of-magnitude-computer-power growing also diminishes the chances of adventure in life. Believe me, as someone who has undergone a triple bypass, I took great solace in the fact that I was being treated like a Perdue chicken that was routinized and this was just another day in the office for these people. And I was quite content; I didn't want some adventuring aviator-type, you know, here comes the Mad Baron to do my heart surgery. Heck no! I was quite happy to have this as mechanized and routinized and as dull as possible. And that's why, of course, we like all of this of technology. We like GPS for our boats, but we should tally up the cost in intellectual thrills. It's sort of too bad that you can't really have the intellectual thrill of celestial navigation that your life depends on anymore. You can do it—going out to sea and deliberately throwing your GPS units overboard and pulling out your sextant and wind-up watch—yeah you can do that, you can throw your radio overboard too, and then you can be really roughing it, but it's not like real exploring in the wilderness, it's like roughing it at a national park. You know that there's a helicopter to take you away if you break your leg just around the corner.
We've had a lot of conversation, I'm happy with that.
Uzgalis: Good! I think our conversation has shown me how central and important computers have been in your philosophical thinking and I want to congratulate you one more time on receiving the Barwise Prize.
Dennett: I appreciate it, I really do.

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