PUBLISHER'S NOTES

What is the sound of one bit processing?

The human brain can process close to 50 million "bits" of information per second, according to physicist Evan Harris Walker, author of *The Physics of Consciousness* (Perseus Publishing, 2000). He calculates this figure by using a complex equation which takes into account (among other factors) the number of neurons in the brain (10 billion), the number of synapses per neuron (2,350), the number of electrons it takes to fire a synapse (200,000) in relation to the number of available "donor" RNA molecules (7.45×10^{20}), and the speed with which an electron can hop from synapse to synapse (8.4 trillionths of a second) factored into the time it takes for a synapse to react to the presence of the electrons (0.3 milliseconds).

So this, by Walker's estimation, is a measure of the human "computer", or what he calls the "consciousness data rate"—our stream of consciousness. Compared to the fastest digital computer, we're pretty slow-witted.

Yet we homo sapiens have an extraordinary ability to communicate in ways no machine can be taught, and to reason in ways no computer can ever match.

Perhaps this is tied to another interesting characteristic of our brains which differentiates us from binary thinking machines, and which Walker discusses in detail—namely, the presence in our brains of minute quantities of melanin, which he says drains off a certain percentage of mental energy and prevents our synapses from overloading. Indeed it is melanin which ultimately diffuses the electrons in our brains to the point where we lose consciousness at regular intervals. We call this state "sleep".

Because of the retarding effect of melanin, our brains cannot capture our conscious experience at the actual speed at which our synapses fire (0.3 milliseconds); instead our minimum "consciousness time interval" is much longer, about four hundredths of a second, making each individual image we record approximately 1.9 million bits.

This, then, explains why a movie running at 30 frames per second (0.0333 seconds per frame) appears to move continuously, but at 15 frames per second (0.0666 seconds per frame) we can detect choppiness in the motion as our brains recognize the individual frames.

So, by Walker's estimation, life goes by in increments of 25 frames per second, 1,500 frames per minute, 90,000 frames per hour.

Yet by virtue of this amazing organic mechanism, we enjoy an advantage over machines which whiz along at many gigaflops. Our relatively slow processing power allows us time to stop and smell the roses—or absorb and analyze data in larger chunks, rather than one bit at a time.

And because we can see the big picture—relatively speaking—we human beings are actually "smarter" than any computer—even one of Apple's new 1GHz dual processor Power Mac G4s. If we weren't, it would take me millions of lines of programming code to explain to you how to navigate to page 26 of this magazine using your opposable thumb and fingers and read my special report on Apple's latest product announcements (*What's the*

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spin on the "digital hub"?). It would probably take even more complex programming to describe the underlying philosophy of good typography, which you could get a grasp on so much quicker through *Good Reading* by Nick Shinn on page 22.

Yes, the brain is a remarkable organ. After all, what machine could conceive of combining multi-angle digital video, surround sound, special effects, VR and PDFs on one simple DVD disc—just to show off the talents of a rock band? Surely this is something only possible through a collaboration of human experiences like those of Toronto band Bomb Chianti and Bob Connolly, who has written this story in *DVD Kills the Video Star* (page 8).

And just imagine how excruciatingly hellish it would be if Bob had to edit video at 3500 frames per second, or fast enough to match our actual synaptic bursts. Would even *Final Cut Pro* 3 on the fastest G4 be good enough? No, Bob is satisfied with Apple's latest software because it handles video at human speeds, and page 34 (*Mac users get high end video editing in OS X*) tells the rest of the tale.

What computer could stop long enough to appreciate the image capture and video playback of a Canon Optura 100MC? None that I know of. Yet I know that you, gentleminded reader, will relish every word of Peter Dudar's review on page 38 (*Trading 'pocketability" for quality and control*).

Software and hardware can do many things, but it seems that only the human eye and brain can recognize a perfect outline around a complex object. Proof of this came when Lidka Schuch and Mona Idriss went in search of tracing programs; they came up empty-handed, as their combined report describes on page 16, *Just an Outline?*

So you see? Computers may have dynamic data processing capabilities, but they don't have *consciousness* to apply their processing power to new situations and environments. If they did, would they allow themselves to be strapped to someone's head, like the Xybernaut poma illustrated in *Take a walk on the WWWild side*, on page 40? Somehow I don't think so.

Evan Harris Walker quotes from Alan Watts' book *Three*, which in turn recounts the "Three Barriers" or three questions and answers posed to monks seeking a higher truth by eleventh century Zen master Huang-lung:

Question: *Everybody has a place of birth. Where is your place of birth?*
Answer: *Early this morning I ate white rice gruel. Now I am hungry again.*
Question: *How is my hand like the Buddha's hand?*
Answer: *Playing the lute under the moon.*
Question: *How is my foot like a donkey's foot?*
Answer: *When the white heron stands in the snow it has a different color.*

Try asking a computer these questions.

Thought is an illusion created by the mind. The brain can be fooled as easily as the eye. Consciousness is reality.

Got it?

Good.

Now go back and stare at your computer until it crashes.