

ligent behavior. The bacterium senses something, “computes” something (although we may not know exactly how), and returns an appropriate response.

No brain need be involved. A primitive jellyfish doesn’t have a central nervous system or brain. What it has is a kind of neural layer or nerve net that lets it sense and react appropriately. I’m arguing that all these aspen roots—this vast global digital network that is sensing, “computing,” and reacting appropriately—are starting to constitute a neural layer for the economy. The second economy constitutes a neural layer for the physical economy. Just what sort of change is this qualitatively?

Think of it this way. With the coming of the Industrial Revolution—roughly from the 1760s, when Watt’s steam engine appeared, through around 1850 and beyond—the economy developed a muscular system in the form of machine power. Now it is developing a neural system. This may sound grandiose, but actually I think the metaphor is valid. Around 1990, computers started seriously to talk to each other, and all these connections started to happen. The individual machines—servers—are like neurons, and the axons and synapses are the communication pathways and linkages that enable them to be in conversation with each other and to take appropriate action.

Is this the biggest change since the Industrial Revolution? Well, without sticking my neck out too much, I believe so. In fact, I think it may well be the biggest change ever in the economy. It is a deep qualitative change that is bringing intelligent, automatic response to the economy. There’s no upper limit to this, no place where it has to end. Now, I’m not interested in science fiction, or predicting the singularity, or talking about cyborgs. None of that interests me. What I am saying is that it would be easy to underestimate the degree to which this is going to make a difference.

I think that for the rest of this century, barring wars and pestilence, a lot of the story will be the building out of this second economy, an unseen underground economy that basically is giving us intelligent reactions to what we do above the ground. For example, if I’m driving in Los Angeles in 15 years’ time, likely it’ll be a driverless car in a flow of traffic where my car’s in a conversation with the cars around it that are in conversation with general traffic and with my car. The second economy is creating for us—slowly, quietly, and steadily—a different world.