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FREE WILL (AND WHY YOU STILL DON'T HAVE IT)

BY SAM HARRIS

My last post on free will elicited a very heated response. Many readers sent emails questioning my sanity, and several asked to be permanently removed from my mailing list.

WELL SAM, SINCE MOST OF THE PEOPLE ON YOUR MAILING LIST PROBABLY TEND TO BE OF THE RATIONAL VARIETY, I WOULD SURMISE THAT THEY DIDN'T REACT NEGATIVELY, SIMPLY BECAUSE YOU HELD A DIFFERENT POSITION THAN THEY DID, BUT THAT THEY WERE DISAPPOINTED THAT YOU, ONE OF THE BIGGEST HEROES OF THE MODERN SKEPTICAL MOVEMENT IN AMERICA, WOULD ASSERT YOUR POSITION AS FACT, AND SUPPORT YOUR ARGUMENT WITH ZANY SCENARIOS THAT OFFERED NOTHING IN THE WAY OF PROOF.

NOW YOU HAVE A CHANCE TO REDEEM YOURSELF.

Many others wrote to share the Good News that quantum mechanics has liberated the human mind from the prison of determinism. It seems I touched a nerve. In the hopes of clearing up some confusion, I've culled another post from my discussion of free will in:

THE MORAL LANDSCAPE

The human brain must respond to information coming from several domains: from the external world, from internal states of the body, and, increasingly, from a sphere of meaning--which includes spoken and written language, social cues, cultural norms, rituals of interaction, assumptions about the rationality of others, judgments of taste and style, etc.

SAM, EVERY ITEM ON THAT LONG LIST, "A SPHERE OF MEANING" COME FROM EITHER THE INTERNAL, OR THE EXTERNAL WORLD. SO I THINK YOU HAVE ONLY DESIGNATED 2 DOMAINS: EXTERNAL AND INTERNAL.

Generally, these streams of information seem unified in our experience: You spot your best friend standing on the street corner looking strangely disheveled. You recognize that she is crying and frantically dialing her cell phone. Was she involved in a car accident? Did someone assault her? You rush to her side, feeling an acute desire to help. Your "self" seems to stand at the intersection of these lines of input and output. From this point of view, you tend to feel that you are the source of your own thoughts and actions. You decide what to do and not to do. You seem to be an agent acting of your own free will. The problem, however, is that this point of view cannot be reconciled with what we know about the human brain. All of our behavior can be traced to biological events about which we have no conscious knowledge: this has always suggested that free will is an illusion.

SAM, IF OUR BRAINS WERE CONSCIOUSLY AWARE OF EVERY BIOLOGICAL FUNCTION OCCURRING WITHIN OUR BODIES AT EVERY INSTANT, HOW COULD THE BRAIN POSSIBLY FUNCTION? IT WOULD HAVE TO BE THE SIZE OF THE EMPIRE STATE BUILDING.

THERE ARE ZILLIONS OF BACTERIA TO KEEP TRACK OF; THERE ARE COUNTLESS CELLS TO MONITOR; THERE ARE INNUMERABLE INVADERS AT ANY GIVEN INSTANT; WHY DO YOU THINK, THAT BECAUSE THE BRAIN ISN'T CONSCIOUS OF EVERY BIOLOGICAL EVENT OCCURRING IN THIS MOUNTAIN OF ACTIVITY, THAT THIS INDICATES THE CONSCIOUS MIND CANNOT EXERCISE FREE WILL?

LACKING CONSCIOUS KNOWLEDGE OF BIOLOGICAL EVENTS ONLY SUGGESTS TO *SOME* THAT FREE WILL IS AN ILLUSION. TO OTHER NEUROSCIENTISTS IT SUGGESTS THAT BASIC BIOLOGICAL FUNCTIONS ARE HANDLED SUBCONSCIOUSLY BY THE AUTONOMIC NERVOUS SYSTEM, RESPIRATORY SYSTEM, AND OTHER BODILY SYSTEMS.

The physiologist Benjamin Libet famously demonstrated that activity in the brain's motor regions can be detected some 300 milliseconds before a person feels that he has decided to move.

SAM, ANOTHER LIBET STUDY SHOWED THAT IT TAKES UP TO A HALF SECOND FOR OUR BRAIN TO REALIZE STIMULI. THAT SHOWED THAT THE BRAIN'S AWARENESS OF TIME IS NOT ALL THAT GREAT. LIBET ALSO DEMONSTRATED THAT TEST SUBJECTS COULD INHIBIT SUBCONSCIOUS COMMANDS. WITHOUT FREE WILL, HOW DID THEY DO THAT? WHAT EVIDENCE DO YOU OFFER TO INDICATE THAT CONSCIOUS BRAIN ACTIVITY IS RESTRICTED TO THE NARROW REGION MEASURED BY LIBET? I ASK BECAUSE IN ANOTHER STUDY, OTHER AREAS OF THE BRAIN NOT NORMALLY ASSOCIATED WITH MOVEMENT, BECAME ACTIVE *BEFORE* THE ACTIVITY REGISTERED IN THE MOTOR REGIONS OF THE BRAIN. IN YET ANOTHER STUDY, RESEARCHERS SHOWED THAT AWARENESS OF INTENT OCCURRED IN THE BRAIN LONG AFTER THE DECISION WAS MADE.

SAM, YOU'RE NOT CHERRY-PICKING THE STUDIES YOU LIKE, AND IGNORING THOSE YOU DON'T, ARE YOU?

EVOLUTION QUESTION, SAM: 2 MONKEYS ARE ROAMING THE JUNGLES OF AFRICA. BOTH ARE ATTACKED BY LEOPARDS. THE FIRST MONKEY'S MOTOR REGIONS REACT INSTANTLY AS IT BEGINS TO RUN, AND 300 MILLISECONDS LATER THE DECISION TO RUN REGISTERS IN ITS CONSCIOUSNESS. THE SECOND MONKEY FEELS THE DECISION IN HIS BRAIN BEFORE THE MOTOR REGIONS KICK INTO ACTION AND HE BEGINS TO RUN.

SAM, WHICH MONKEY DO *YOU* THINK NATURAL SELECTION WILL FAVOR?

Another lab recently used fMRI data to show that some "conscious" decisions can be predicted up to 10 seconds before they enter awareness (long before the preparatory motor activity detected by Libet).

SAM, IT SOUNDS LIKE YOU ARE REFERRING TO THE CHUN SOON EXPERIMENTS IN 2008. THEY CONCLUDED THAT THE FRONTAL AND PARIETAL CORTICAL AREAS INFLUENCED THE DECISION UP TO 10 SECONDS BEFORE THE CONSCIOUS DECISION TO PRESS THE BUTTON WAS REALIZED. THE CONCLUSION THAT WE ARE NOT THE SOURCE OF OUR ACTIONS, WAS NOT THEIRS ... BUT YOURS.

THESE *BUTTON PRESS* TESTS MAY ONLY SHOW THAT AUTOMATIC, SIMPLE RESPONSES ARE CONTROLLED BY THE SUBCONSCIOUS, AND THEREFORE AREN'T TESTING FREE WILL AT ALL.

YOU ARE TRYING TO EQUATE AWARENESS WITH INTENT. STUDIES HAVE SHOWN THAT DECISION-MAKING IS A COMPLEX PROCESS SCATTERED OVER MANY AREAS OF THE BRAIN. IT IS NOT A SINGLE EVENT THAT IS LIKELY TO BE ACCURATELY REPRESENTED BY A BUTTON PRESS TEST THAT IS ONLY MONITORING ONE SMALL AREA OF THE BRAIN. STUDYING THIS COMPLEX PROCESS INCLUDES ATTEMPTING TO MEASURE THE "READINESS POTENTIAL" AND "RAMPING UP" AMONG OTHER ACTIVITIES.

Clearly, findings of this kind are difficult to reconcile with the sense that one is the conscious source of one's actions.

SAM, USING EVOLUTION AS AN EXAMPLE ONCE AGAIN, LET'S SAY RESEARCHERS DISCOVER A NEW SPECIES THAT DOESN'T FIT ON THE TREE OF LIFE WHERE THEY EXPECTED. HAS EVOLUTION BEEN FALSIFIED? WELL, IT'S POSSIBLE. BUT WHAT USUALLY HAPPENS IS THAT SCIENTISTS LEARN MORE ABOUT THEIR NEW DISCOVERY AND PUT IT INTO ITS PROPER PLACE ON THE TREE. IT MAY EVEN REPRESENT A NEW BRANCH.

FINDINGS THAT ARE DIFFICULT TO RECONCILE WITH THE CONCEPT OF FREE WILL, DO BRING THE PARADIGM INTO QUESTION. HOWEVER, IT MIGHT BE MORE PRUDENT TO TRY TO DISCOVER WHY THE RESULTS CAME OUT THE WAY THEY DID, AND WHAT THIS NEW EVIDENCE CAN TEACH US ABOUT HOW THE BRAIN FUNCTIONS, BEFORE ASSUMING THAT THE CONCEPT OF FREE WILL IS ONLY AN ILLUSION.

And the distinction between "higher" and "lower" systems in the brain offers no relief: for I no more initiate events in executive regions of my prefrontal cortex than I cause the creaturely outbursts of my limbic system.

SAM, YOUR CLAIM ABOUT THE PREFRONTAL CORTEX IS AN ASSERTION; AS IS YOUR CLAIM THAT HIGHER AND LOWER SYSTEMS IN THE BRAIN OFFER NO RELIEF. WHAT EVIDENCE DO YOU OFFER TO SUPPORT EITHER ASSERTION?

THE HIGHER AND LOWER SYSTEMS TO WHICH YOU REFER, ARE THE CONSCIOUS MIND AND THE SUBCONSCIOUS. LEARNING ILLUSTRATES HOW THE TWO CAN WORK TOGETHER: CONSCIOUS INTENT IS REQUIRED TO LEARN A NEW SKILL (UNLESS YOU CAN EXPLAIN HOW IT IS POSSIBLE FOR A SKILL TO ORIGINATE FROM BIOLOGY WHICH HAS NEVER ENCOUNTERED IT BEFORE). ONCE LEARNED, THAT SKILL BECOMES SECOND NATURE, AND WE HARDLY HAVE TO THINK ABOUT IT AS WE PERFORM IT. IT HAS BEEN RELEGATED TO THE DOMAIN OF THE SUBCONSCIOUS.

The truth seems inescapable:

SAM, IF THE TRUTH WERE INESCAPABLE, THERE WOULD BE A SCIENTIFIC CONSENSUS ON THIS TOPIC. AFTER RESEARCHING THE ISSUE, I DON'T GET THE IMPRESSION THAT YOUR SIDE HAS ANYWHERE NEAR THAT LEVEL OF SUPPORT. SO APPARENTLY MANY NEUROSCIENTISTS HAVE BEEN ABLE TO ESCAPE WHAT YOU CALL "THE TRUTH."

I, as the subject of my experience, cannot know what I will next think or do until a thought or intention arises;

SAM, THAT IS THE CRUX OF THE DEBATE: WHAT CAUSES THOUGHTS AND INTENTIONS TO "ARISE?" YOUR POSITION IS THAT OUR THOUGHTS AND INTENTIONS ARISE WITHIN US AND THEN WE NOTICE THEM. YET, OTHER THAN CALLING THEM BIOLOGICAL CAUSAL AGENTS, YOU DON'T EXPLAIN HOW OR WHY THEY INITIATE INTENTION. OTHER NEUROSCIENTISTS BELIEVE THAT OUR CONSCIOUS MIND LEARNS TO USE VARIOUS STRUCTURES SCATTERED THROUGHOUT MANY DIFFERENT AREAS OF OUR BRAIN TO INITIATE THOSE THOUGHTS AND INTENTIONS.

and thoughts and intentions are caused by physical events and mental stirrings of which I am not aware.

SAM, STUDIES HAVE SHOWN THAT INTROSPECTION IS UNRELIABLE. BUT WHAT YOU ARE FAILING TO MENTION IS, ALL THE MENTAL STIRRINGS OF WHICH YOU *ARE* AWARE. ARE YOU REALLY CLAIMING THAT YOU ARE NOT AWARE OF *ANY* MENTAL STIRRINGS? I CAN SEE HOW THAT STATEMENT COULD HONESTLY BE MADE BY SOMEONE LIKE, SAY RAY COMFORT, BUT I FIND IT HARD TO BELIEVE THAT IT COULD APPLY TO YOU.

Of course, many scientists and philosophers realized long before the advent of experimental neuroscience that free will could not be squared with an understanding of the physical world.

SAM, IT DOESN'T MATTER WHAT THEY REALIZED. THEY DID NOT HAVE ACCESS TO MODERN SCIENCE. THE BATTLEGROUND OF THE DEBATE HAS MOVED OUT OF PHILOSOPHY AND INTO NEUROSCIENCE BECAUSE ONLY NEUROSCIENCE CAN PROVIDE THE EVIDENCE REQUIRED. PHILOSOPHY WILL ADJUST TO THE NEUROSCIENCE, NOT THE OTHER WAY AROUND.

Nevertheless, many still deny this fact.

SAM, THAT IS EXACTLY MY POINT. THIS IS NOT AS SETTLED AS YOU SEEM TO THINK IT IS. AND THOSE WHO REJECT YOUR VIEW INCLUDE MANY QUALIFIED EXPERTS IN THE FIELD OF NEUROSCIENCE.

For instance, the biologist Martin Heisenberg has observed that some fundamental processes in the brain, like the opening and closing of ion channels and the release of synaptic vesicles, occur at random, and cannot, therefore, be determined by environmental stimuli. Thus, much of our behavior can be considered "self-generated," and therein, he imagines, lies a basis for free will. But "self-generated" in this sense means only that these events originate in the brain. The same can be said for the brain states of a chicken.

SAM, HOW DOES EQUATING THE BRAIN STATES OF HUMANS AND CHICKENS HAVE ANY EFFECT ON THE ISSUE OF FREE WILL?

If I were to learn that my decision to have a third cup of coffee this morning was due to a random release of neurotransmitters, how could the indeterminacy of the initiating event count as the free exercise of my will? Such indeterminacy, if it were generally effective throughout the brain, would obliterate any semblance of human agency. Imagine what your life would be like if all your actions, intentions, beliefs, and desires were "self-generated" in this way: you would scarcely seem to have a mind at all.

SAM, AND YOUR POSITION IS DIFFERENT ... HOW?

YOUR SOURCE IS DETERMINISTIC, THEIRS IS INDETERMINANT, BUT THE RESULT SEEMS TO BE THE SAME - THE CONCLUSION THAT WE ARE JUST ROBOTS.

You would live as one blown about by an internal wind. Actions, intentions, beliefs, and desires can only exist in a system that is significantly constrained by patterns of behavior and the laws of stimulus-response. In fact, the possibility of reasoning with other human beings--or, indeed, of finding their behaviors and utterances comprehensible at all--depends on the assumption that their thoughts and actions will obediently ride the rails of a shared reality. In the limit, Heisenberg's "self-generated" mental events would amount to utter madness.

SAM, I WOULDN'T CRITICIZE SO HARSHLY, SOMEONE WHOSE END RESULT MIRRORS YOUR OWN.

And the indeterminacy specific to quantum mechanics offers no foothold. Even if our brains were quantum computers, the brains of chimps, dogs, and mice would be quantum computers as well. (I don't know of anyone who believes that these animals have free will.)

SAM, I PROBABLY SHOULDN'T BROADCAST THIS IN PUBLIC AFTER YOU JUST SAID THAT NO ONE BELIEVES ANIMALS HAVE FREE WILL, BUT ... I DO.

HOWEVER, I DON'T BELIEVE THAT SPONGES (SEA CREATURES THAT HAVE NO BRAIN) ARE CAPABLE OF FREE WILL BECAUSE THEY LACK THE NECESSARY PHYSICAL STRUCTURES TO FORM THOUGHTS. BUT I THINK NEARLY ALL ANIMALS USE THEIR BRAINS TO VARYING DEGREES TO MAKE DECISIONS. THE HIGHER THE INTELLECT - THE GREATER THE DEGREE OF FREE WILL.

IF THAT MAKES ME A MORON, THEN SO BE IT. I'M CERTAINLY OPEN TO EVIDENCE TO THE CONTRARY.

BUT I'M A LITTLE SURPRISED THAT YOU KNOW OF NO ONE WHO BELIEVES THAT ANIMALS HAVE FREE WILL BECAUSE THERE WAS A BRAIN STUDY THAT WAS ABLE TO PREDICT THE ACTIONS OF MONKEYS IN ADVANCE. NOT MOTOR ACTIONS, SAM, BUT ACTUAL PLANNING. IN OTHER WORDS, THEY WERE CAPABLE OF PROCESSES THAT REQUIRED DECISION-MAKING. I UNDERSTAND THAT YOU DON'T BELIEVE THAT DECISION-MAKING INDICATES FREE WILL; BUT THAT IS ONLY TRUE ... IF YOU ARE RIGHT.

And quantum effects are unlikely to be biologically salient in any case. They do drive evolution, as high-energy particles like cosmic rays cause point mutations in DNA, and the behavior of such particles passing through the nucleus of a cell is governed by the laws of quantum mechanics. (Evolution, therefore, seems unpredictable in principle.) But most neuroscientists do not view the brain as a quantum computer. Again, even if we knew that human consciousness depended upon quantum processes, it is pure hand-waving to suggest that quantum indeterminacy renders the concept of free will scientifically intelligible.

If the laws of nature do not strike most of us as incompatible with free will, it is because we have not imagined how human action would appear if all cause-and-effect relationships were understood. Consider the following thought experiment: Imagine that a mad scientist has developed a means of controlling the human brain at a distance. What would it be like to watch him send a person to and fro on the wings of her "will"?

I DON'T KNOW SAM, MAYBE LIKE SOMEONE MANIPULATING A PUPPET?

Would there be even the slightest temptation to impute freedom to her? No.

SAM, ARE YOU SURE YOU MEANT TO SAY "WATCH HIM SEND?" YOUR QUESTION WOULD ONLY MAKE SENSE IF YOU MEANT TO SAY "WATCH HER GO TO AND FRO?" BUT ACCORDING TO YOUR FIRST ESSAY, YOU DIDN'T CHOOSE THOSE WORDS DID YOU? BIOLOGICAL CAUSAL AGENTS CHOSE THEM AND THEN NOTIFIED YOU.

SAM, MAYBE THE NEXT TIME YOUR BIOLOGICAL CAUSAL AGENTS CONTACT YOU, YOU MIGHT WANT TO TELL THEM ... THEY GOT THAT ONE WRONG.

But this mad scientist is nothing more than causal determinism personified.

BUT SAM, YOU NEED TO PROVE THAT YOUR MAD SCIENTIST CAUSES EVERYTHING. THAT HAS NOT BEEN PROVEN YET. YOUR MAD SCIENTIST MAY NOT BE THE ONLY COOK IN THE KITCHEN.

What makes his existence so inimical to our notion of free will is that when we imagine him lurking behind a person's thoughts and actions--tweaking electrical potentials, manufacturing neurotransmitters, regulating genes, etc.--we cannot help but let our notions of freedom and responsibility travel up the puppet's strings to the hand that controls them.

SAM, YOU HAVE SIMPLY SUBSTITUTED AN IMAGINARY MAD SCIENTIST, REPRESENTING CAUSAL DETERMINISM, FOR THE CONCEPT OF GOD.

To see that the addition of randomness--quantum mechanical or otherwise--does nothing to change this situation, we need only imagine the scientist basing the inputs to his machine on a shrewd arrangement of roulette wheels, or on the decay of some radioactive isotope. How would such unpredictable changes in the states of a person's brain constitute freedom?

SAM, YOU ARE SPENDING AN AWFUL LOT OF TIME ARGUING AGAINST ONE SMALL GROUP WHO HOLD THE BELIEF THAT QUANTUM INDETERMINACY INDICATES FREE WILL. I DON'T THINK THAT IS THE POSITION OF MOST OF YOUR OPPONENTS.

All the relevant features of a person's inner life could be conserved--thoughts, moods, and intentions would still arise and beget actions--and yet, once we imagine a hypothetical mad scientist dispensing the appropriate cocktail of randomness and natural law, we are left with the undeniable fact that the conscious mind is not the source of its own thoughts and intentions.

SAM, IF IT WERE AN UNDENIABLE FACT, AS YOU CLAIM, NEUROSCIENTISTS WOULD NOT BE AS DIVIDED AS THEY ARE ON THE SUBJECT OF FREE WILL. REALITY SHOWS THAT YOUR "FACT" MAY NOT BE NEARLY AS UNDENIABLE AS YOU WOULD HAVE US BELIEVE.

This discloses the real mystery of free will: if our moment to moment experience is compatible with its utter absence, how can we say that we see any evidence for it in the first place?

SAM, THAT'S YET ANOTHER HYPOTHETICAL BIG "IF." WE DO SEE EVIDENCE OF FREE WILL EVERY TIME WE DIRECT OUR HAND TO MOVE. THAT DOESN'T MEAN THAT FREE WILL IS MOVING IT, IT ONLY MEANS THERE IS EVIDENCE THAT SOMETHING WE CALL FREE WILL MIGHT BE MOVING IT. THEREFORE, WE *CAN* SAY THAT WE SEE EVIDENCE FOR FREE WILL.

None of this, however, renders the choices we make in life any less important.

SAM, YOU JUST SPENT 2 ESSAYS ATTEMPTING TO PERSUADE US THAT "WE" DON'T MAKE CHOICES; THAT "WE" ARE NOT THE AUTHORS OF OUR OWN THOUGHTS; THAT THEY ARE CREATED BY SOMETHING THAT WE AREN'T EVEN AWARE OF. SO WHY DID YOU SAY "THE CHOICES WE MAKE" INSTEAD OF "THE CHOICES MADE FOR US?"

HAD YOU REMAINED CONSISTENT, YOUR SENTENCE WOULD HAVE READ, "NONE OF THIS, HOWEVER, RENDERS THE CHOICES MADE FOR US IN LIFE ANY LESS IMPORTANT." SAM, WHEN WORDED IN THE CONTEXT OF WHAT YOU BELIEVE, IT BECOMES OBVIOUS THAT YOU HAVE REFUTED YOURSELF, BECAUSE THERE IS NO IMPORTANCE TO CHOICES WE THINK WE ARE MAKING, IF THEY ARE MADE FOR US.

As my friend Dan Dennett has pointed out, many people confuse determinism with fatalism.

SAM, ACCORDING TO THE DICTIONARY, DETERMINISM AND FATALISM ARE SYNONYMS; SO IT SHOULD NOT BE SURPRISING THAT MANY PEOPLE CONFUSE THEM. IN FACT, AFTER READING THEIR DEFINITIONS, I'M SURPRISED ANYONE CAN TELL THEM APART. BUT THEY ARE DIFFERENT WORDS SO PLEASE GO ON.

This gives rise to questions like, "If everything is determined, why should I do anything? Why not just sit back and see what happens?"

SAM, IF YOU DON'T WANT TO STARVE TO DEATH THEN YOU HAD BETTER GO FIND SOME FOOD. THE HUNGER URGE DOES COME FROM CAUSAL AGENTS OVER WHICH WE HAVE NO CONTROL, BUT THE OPTIONS AVAILABLE FOR DECIDING HOW BEST TO OBTAIN THAT FOOD DO REQUIRE HIGHER LEVELS OF MENTAL ACTIVITY (CONSCIOUSNESS). CONCLUSION: NO MATTER HOW HUNGRY THEY GET, ANIMALS PROBABLY DON'T CATCH A LOT OF THEIR FOOD ... WHILE ASLEEP.

But the fact that our choices depend on prior causes does not mean that they do not matter.

SAM, WHEN YOUR PRIOR CAUSE TELLS YOU TO GO TO THE TOOLBOX TO GET A PHILLIPS SCREWDRIVER, BUT YOU ACCIDENTALLY PICK UP AND RETURN WITH A FLAT BLADED SCREWDRIVER BY MISTAKE, WHAT PRIOR CAUSE MADE YOU CHOOSE THE WRONG SCREWDRIVER?

If I had not decided to write my last book, it wouldn't have written itself. My choice to write it was unquestionably the primary cause of its coming into being. Decisions, intentions, efforts, goals, willpower, etc., are causal states of the brain, leading to specific behaviors, and behaviors lead to outcomes in the world.

SAM, SO IF WILLPOWER IS A CAUSAL STATE OF THE BRAIN LEADING TO SPECIFIC BEHAVIOR, WHY DO YOU CLAIM THERE IS NO EVIDENCE FOR FREE WILL?

Human choice, therefore, is as important as fanciers of free will believe.

SAM, WE AGREE AGAIN. THAT'S MAKES 2 NOW DOESN'T IT?

And to "just sit back and see what happens" is itself a choice that will produce its own consequences. It is also extremely difficult to do: just try staying in bed all day waiting for something to happen; you will find yourself assailed by the impulse to get up and do something, which will require increasingly heroic efforts to resist.

QUESTION SAM, IF WE DON'T HAVE FREE WILL, HOW CAN WE EXERT HEROIC EFFORTS TO RESIST THE PRIOR CAUSES THAT YOU CLAIM ARE DETERMINING OUR ACTIONS?

YOU, AS A NEUROSCIENTIST, MUST SURELY BE AWARE THAT STUDIES (INCLUDING BY LIBET HIMSELF) HAVE SHOWN THAT HUMANS DO HAVE VETO POWER OVER THE PRIOR CAUSES WHICH YOU CLAIM DETERMINE OUR ACTIONS. THIS EXPLAINS THE HEROIC EFFORTS OF PEOPLE TO RESIST PRIOR CAUSES, AS IN THE CASE OF THOSE WHO OVERCOME POWERFUL ADDICTIONS.

VETO POWER IS ALSO SOLID EVIDENCE FOR THE EXISTENCE OF FREE WILL; FOR EVEN IF THE ABILITY TO INHIBIT PRIOR CAUSES WERE THE *ONLY* MANIFESTATION OF FREE WILL, THEN IT COULD NOT BE AN ILLUSION. THE ARGUMENT THEN BECOMES, TO WHAT DEGREE DO WE HAVE IT?

Therefore, while it is true to say that a person would have done otherwise if he had chosen to do otherwise, this does not deliver the kind of free will that most people seem to cherish--because a person's "choices" merely appear in his mental stream as though sprung from the void.

SAM, WHY DO YOU THINK THAT CONSCIOUS CHOICES SEEM TO SPRING FROM A VOID? THE MEMORIES THAT ARE STORED IN THE PHYSICAL STRUCTURES OF THE BRAIN FROM WHICH OUR CONSCIOUSNESS DRAWS ITS INFORMATION BEFORE MANIPULATING THAT DATA, COULD BE DESCRIBED IN MANY WAYS; BUT "A VOID" ISN'T ONE OF THEM.

From the perspective of your conscious mind, you are no more responsible for the next thing you think (and therefore do) than you are for the fact that you were born into this world.

SAM, FROM THE PERSPECTIVE OF OUR CONSCIOUS MINDS WE *ARE* RESPONSIBLE FOR ORIGINATING OUR THOUGHTS AND ACTIONS; THAT IS WHY SO MANY PEOPLE BELIEVE IN FREE WILL. OUR CONSCIOUS MINDS TELL US THAT WE ARE INITIATING THOUGHTS AND ACTIONS. IT IS FROM THE PERSPECTIVE OF PEOPLE WHO DENY THE EXISTENCE OF FREE WILL, THAT WE ARE NOT RESPONSIBLE FOR ORIGINATING OUR THOUGHTS AND ACTIONS.

REGARDING YOUR ANALOGY: THE NEXT THING YOU THINK AND DO IS USUALLY PRECEDED BY AN INTENTION, WHICH IS NOTHING LIKE THE INVOLUNTARY EVENT OF BEING BORN. THEREFORE, THAT SHOULD BE CONSIDERED A FALSE ANALOGY.

Our belief in free will seems to arise from our moment-to-moment ignorance of the specific prior causes of our thoughts and actions.

SAM, BELIEF CANNOT ARISE FROM IGNORANCE. THAT DOESN'T EVEN MAKE SENSE. BELIEF CAN ONLY ARISE FROM EVALUATING INFORMATION. THAT SOUNDED LIKE A BACKHANDED WAY OF CALLING THOSE YOU DISAGREE WITH, IGNORANT.

The phrase "free will" describes what it feels like to be identified with the content of each mental state as it arises in consciousness.

SAM, THAT WAS NOT THE DEFINITION OF FREE WILL ACCORDING TO THE SOURCES I QUOTED IN YOUR LAST ESSAY. PERHAPS YOU COULD SUPPLY A REFERENCE TO SUPPORT YOUR VERSION OF THE DEFINITION?

Trains of thought like, "What should I get my daughter for her birthday? I know, I'll take her to a pet store and have her pick out some tropical fish," convey the apparent reality of choices, freely made.

SAM, WHEN HUMANS ASSUMED THAT THE SUN WAS CIRCLING THE EARTH, THEY BASED THAT BELIEF ON THE EVIDENCE BEFORE THEIR EYES. BUT AS IRREFUTABLE EVIDENCE TRICKLED IN OVER THE CENTURIES DURING THE ENLIGHTENMENT, THE BURDEN OF PROOF, PLACED UPON THOSE WHO PROPOSED A HELIOCENTRIC SOLAR SYSTEM, HAD BEEN MET, AND THE PARADIGM CHANGED.

FREE WILL EXPLAINS CHOICES AND ACTIONS IN A NATURALISTIC WAY WITHOUT RESORTING TO GODS OR ANY OTHER ENTITIES ACTING AS PUPPET MASTERS. THE EVIDENCE, AS YOU YOURSELF JUST ADMITTED, IS "APPARENT." THEREFORE, THE BURDEN OF PROOF IS ON THOSE WHO OFFER A NEW ALTERNATIVE THEORY (IN THIS CASE ... THAT WOULD BE YOU) TO PROVE WHAT CAUSES OUR THOUGHTS, AND THAT THEREFORE, FREE WILL DOES NOT EXIST, AND IS ONLY AN ILLUSION; AS IS THE SUN CIRCLING THE EARTH.

But from a deeper perspective (speaking both subjectively and objectively), thoughts simply arise (what else could they do?) unauthored, and yet author to our actions.

SAM, TO SAY THEY SIMPLY ARISE IS AN ASSERTION. IN ANSWER TO YOUR CHALLENGE "WHAT ELSE COULD THEY DO?" MANY NEUROSCIENTISTS WOULD SAY THAT THEY ARISE AS A RESULT OF OUR CONSCIOUS MIND MANIPULATING THE PHYSICAL STRUCTURES IN OUR BRAIN.

In the philosophical literature, one finds three approaches to the problem of free will: determinism, libertarianism, and compatibilism. Both determinism and libertarianism are often referred to as "incompatibilist" views, in that both maintain that if our behavior is fully determined by background causes, free will is an illusion. Determinists believe that we live in precisely such a world; libertarians (no relation to the political view that goes by this name) believe that our agency rises above the field of prior causes--and they inevitably invoke some metaphysical entity, like a soul, as the vehicle for our freely acting wills. Compatibilists, like Dan Dennett, maintain that free will is compatible with causal determinism.

The problem with compatibilism, as I see it, is that it tends to ignore that people's moral intuitions are driven by a deeper, metaphysical notion of free will. That is, the free will that people presume for themselves and readily attribute to others (whether or not this freedom is, in Dennett's sense, "worth wanting") is a freedom that slips the influence of impersonal, background causes. The moment you show that such causes are effective--as any detailed account of the neurophysiology of human thought and behavior would-- proponents of free will can no longer locate a plausible hook upon which to hang their notions of moral responsibility.

SAM, EITHER OUR CONSCIOUS MINDS DETERMINE OUR THOUGHTS OR THEY DON'T. IF THEY DO, THEN WE ARE MORALLY RESPONSIBLE FOR THE ACTIONS THAT FOLLOW. IF THEY DON'T, THEN HOW COULD IT BE POSSIBLE TO HOLD SOMEONE MORALLY RESPONSIBLE FOR ACTIONS OVER WHICH THEY HAVE NO CONTROL?

The neuroscientists Joshua Greene and Jonathan Cohen make this same point:

Most people's view of the mind is implicitly dualist and libertarian and not materialist and compatibilist . . . Intuitive free will is libertarian, not compatibilist. That is, it requires the rejection of determinism and an implicit commitment to some kind of magical mental causation

SAM, MANY NEUROSCIENTISTS BELIEVE THAT THE DENDRITES, AXONS, SYNAPSES, AND OTHER PHYSICAL STRUCTURES THAT MAKE UP OUR BRAIN WORK TOGETHER TO CREATE A CONSCIOUS MIND WHICH COULD IN NO WAY BE DESCRIBED AS "MAGICAL."

BUT SAM, WHILE WE ARE ON THE SUBJECT OF MAGIC, HOW IS YOUR DESCRIPTION OF CAUSAL AGENTS LESS MAGICAL?

. . . contrary to legal and philosophical orthodoxy, determinism really does threaten free will and responsibility as we intuitively understand them (Greene J & J. Cohen. 2004).

It is generally argued that our sense of free will presents a compelling mystery: on the one hand, it is impossible to make sense of in causal terms; on the other, we feel that we are the authors of our own actions.

SAM, AS RESEARCHERS CONTINUE TO LEARN MORE ABOUT THE FUNCTIONING OF THE BRAIN, THEY MAY DISCOVER HOW TO BETTER EXPLAIN FREE WILL IN CAUSAL TERMS. THAT SEEMS TO MAKE MORE SENSE THAN ASSUMING THAT THE ENTIRE PARADIGM IS WRONG WHEN YOU ONLY HAVE VERY AMBIGUOUS EVIDENCE TO SUGGEST THAT IT MIGHT BE WRONG.

However, I think that this mystery is itself a symptom of our confusion. It is not that free will is simply an illusion: our experience is not merely delivering a distorted view of reality; rather, we are mistaken about the character of our experience. We do not feel as free as we think we do. Our sense of our own freedom results from our not paying close attention to what it is like to be ourselves in the world. The moment we do pay attention, we begin to see that free will is nowhere to be found,

SAM, HOW DO I PAY CLOSE ATTENTION TO BEING MYSELF IN THIS WORLD? I TRIED IT BUT NOTHING HAPPENED. MAYBE I JUST DON'T KNOW HOW TO DO IT? WHAT EXACTLY AM I SUPPOSED TO THINK THAT WILL MAKE ME UNDERSTAND THAT I HAVE NO FREE WILL?

and our subjectivity is perfectly compatible with this truth. Thoughts and intentions simply arise in the mind.

SAM, NOW WHO IS THE ONE RESORTING TO MAGIC? YOU CANNOT JUST ASSERT THAT THOUGHTS AND INTENTIONS SIMPLY "ARISE IN THE MIND" WITHOUT PROVIDING SOME KIND OF EVIDENCE TO SUPPORT THAT. YOU DIDN'T EVEN PROVIDE A MECHANISM; AT LEAST GHOST WORSHIPPERS OFFER US GOD AS AN EXPLANATION. YOU DIDN'T EVEN DO THAT.

FREE WILL AT LEAST PROVIDES A NATURALISTIC ANSWER. I TELL MY HAND TO MOVE AND IT MOVES. THE FACT THAT MY HAND WENT EXACTLY WHERE I TOLD IT TO, IS EVIDENCE OF FREE WILL - NOT PROOF OF FREE WILL - ONLY EVIDENCE OF IT. BUT SAM, THAT'S MORE THAN YOU'VE OFFERED.

What else could they do?

SAM, THOUGHTS AND INTENTIONS COULD ARISE AS A RESULT OF BEING DIRECTED BY OUR CONSCIOUS MINDS USING THE PHYSICAL STRUCTURES IN OUR BRAINS. THAT IS NOT MEANT TO IMPLY A SEPARATION BETWEEN THE CONSCIOUS MIND AND THOSE STRUCTURES; ONLY THAT THE CONSCIOUS MIND IS MERELY THE MANIFESTATION OF THE PROCESS THAT IS CREATED BY THE COORDINATION OF THOSE STRUCTURES WORKING TOGETHER.

The truth about us is stranger than many suppose: the illusion of free will is itself an illusion.

SAM, ONE THING THE AUDIENCE SHOULD UNDERSTAND ABOUT THIS DEBATE IS MOTIVATION. INTERPRETING DATA SO AS TO SUPPORT THE WIDELY HELD CONCEPT OF FREE WILL WOULD ONLY BORE MOST PEOPLE, AND EVEN IF PROVEN TRUE, WOULDN'T EVEN WIN YOU A PRIZE AT A HIGH SCHOOL SCIENCE FAIR.

BUT TELLING EVERYONE THAT THEY DON'T HAVE FREE WILL AND THAT IN REALITY THEY ARE MERELY BIOLOGICAL ROBOTS, *THAT* WILL ATTRACT QUITE A POWERFUL RESPONSE AS YOU YOURSELF POINTED OUT AT THE BEGINNING OF THIS ESSAY.

SCIENTISTS DON'T WIN NOBEL PRIZES FOR VALIDATING MUNDANE, WIDELY ACCEPTED IDEAS. BUT PROVING THAT WE AREN'T THE AUTHORS OF OUR OWN THOUGHTS - THAT WOULD GUARANTEE ETERNAL LIFE, AT LEAST IN THE HISTORY BOOKS. SO THERE IS A MUCH STRONGER MOTIVATION TO INTERPRET DATA IN NEW WAYS, AND THIS WOULD APPLY TO ALL AREAS OF SCIENCE. HOWEVER, THIS DISCUSSION ON MOTIVATION COULD BE RENDERED MOOT BY ONE THING ... IRREFUTABLE EVIDENCE.

SAM, THESE WERE AN IMPORTANT PAIR OF ESSAYS THAT INSPIRED MANY PEOPLE TO THINK DEEPLY ABOUT A VERY IMPORTANT ISSUE. MANY OF US DO NOT AGREE WITH YOU, HOWEVER, MANY DO. GOOD LUCK WITH YOUR CONTINUED RESEARCH. WE ARE ALL AWAITING EVIDENCE THAT WILL SOMEDAY, HOPEFULLY RESULT IN A CONSENSUS ... WHICHEVER WAY IT MAY FALL.

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BY TUNING A LASER TO PULL RATHER THAN PUSH, RESEARCHERS DESIGN A WORKING TRACTOR BEAM

THERE’S NO ESCAPING IT: THOUGH THE TRACTOR BEAM IS A STAPLE OF SCI-FI SPACE-FARING SCENARIOS, IT’S ALSO EXTREMELY COUNTER-INTUITIVE. HOW DOES ONE PULL SOMETHING IN, VIA AN OUTWARD PROPAGATING BEAM? NOW A FEW CHINESE RESEARCHERS THINK THEY’VE FOUND THE ANSWER VIA A THEORETICAL METHOD THAT SHOULD GENERATE A BACKWARD PULLING FORCE FROM A FORWARD TRAVELING STREAM OF PHOTONS.

THE FUDAN UNIVERSITY TEAM WON’T BE CAPTURING REBEL TRANSPORTS WITH THEIR BEAM ANY TIME SOON–IT ONLY WORKS (THEORETICALLY) AT THE NANO-LEVEL–BUT IT DOES ACHIEVE AN INTERESTING TURNABOUT OF PHYSICAL FORCE. WE KNOW PHOTONS EXERT AN OUTWARD MOMENTUM; THIS IS WHAT ALLOWS SOLAR SAILS TO HARNESS SUNLIGHT TO GENERATE SMALL AMOUNTS OF THRUST. BUT CAREFULLY TUNED TO MEET TWO CONDITIONS, A SYSTEM CAN BE CREATED TO TURN “PUSH” INTO “PULL.”

THE CONDITIONS: FOR ONE, THE MOMENTUM OF THE OUTWARD PROPAGATION MUST BE VERY SMALL. SECOND, SEVERAL MULTIPOLES WITHIN THE TARGET PARTICLE MUST BE EXCITED AT THE SAME TIME, SCATTERING THE BEAM. IF THE ANGLE OF THIS BEAM SCATTERING IS JUST RIGHT, THE TOTAL FORWARD MOMENTUM CAN BE NEGATIVE–THAT IS, IT CAN HAVE NEGATIVE THRUST WHICH EQUATES TO REVERSE THRUST, OR PULL–MEANING THE TARGET IS PULLED BACK DOWN THE STREAM OF PHOTONS TOWARD THE SOURCE: AND VOILA! A TRACTOR BEAM.

IT WON’T REEL IN A CRIPPLED SATELLITE OR AN ENEMY BATTLE CRUISER, BUT IT COULD BE USED AT THE NANOSCALE TO MANIPULATE PARTICLES IN INTERESTING WAYS THAT COULD BE ESPECIALLY USEFUL IN OPTICAL SYSTEMS. THAT IS, IF IT WORKS IN PRACTICE AS WELL AS IT DOES IN THEORY.

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FAMOUS QUOTES

DAVID VIAENE (1965) 46 YEARS OLD

HE WAS A PLAYER IN THE NATIONAL FOOTBALL LEAGUE FOR THE NEW ENGLAND PATRIOTS AND GREEN BAY PACKERS. HE PLAYED AT THE COLLEGIATE LEVEL AT THE UNIVERSITY OF MINNESOTA-DULUTH AND THE UNIVERSITY OF WISCONSIN–PLATTEVILLE.

"GODS DON'T KILL PEOPLE.

PEOPLE WITH GODS KILL PEOPLE."