

JOURNALS FOR THE COURSE
CONSILIENCE: THE COGNITIVE REVOLUTION

2006-2007

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Prologue to the journals-

This has been a very enjoyable course. I loved being made to think about a gradient of ideas. Being able to interview the speakers and to see the minds behind all the ideas we read about made everything so much more fascinating. Discussions amongst classmates and professors will be cherished. I will sorely miss this unique course next year. Maintaining this journal has been very useful in terms of the effort to maintain clarity throughout the lectures and interviews. It was very helpful to consult previous thoughts as they had been recorded in the journal before proceeding to the next speaker in the Caroline Werner Gannett series. Also, now that the course is over, this journal will be something I will treasure, as it clearly shows how this course and the various aspects of it- discussions, interviews, lectures et al- have changed my thought process on these ideas.

For such a delightful course, I have my teachers to thank. Professor Mary Lynn Broe, for always being so enthusiastic about each speaker and arranging all the interviews and lectures. Professor Kristen Waterstram-Rich, for allowing me to be a part of the group despite my utter lack of experience with any such course. It is a wonder that I got by without sounding too daft, and it is all thanks to the two professors and my classmates that I did. For there were times when I did wish I'd been smarter for the course. Having been academically mediocre at best throughout my schooling, I was very happy and encouraged that this course was something I could actually manage. My classmates, Brandy Pappas, Matthew Woodruff, Aaron Fields and Andrew Yee were very supportive and discussions with them have been enlightening and fun.

Rochester, New York

20th September, 2006: Making Sense of Biology

Wednesday

I listened to Dr. Eugenie C. Scott lecture on the evolution vs. creationism debate at the Ingle Auditorium. Never before had I thought about evolution as such a vast concept. It had always been a 'buzz word,' and, I'll admit, the first image that pops into my head when I hear the word has always been that of a caveman. Today, Dr. Scott changed all that by talking of evolution in different fields. She called it a cumulative change over time, and applied it to every field. Anthropological evolution, for instance, could encompass the change in technology through time, or culture, or society. Similarly, changes in the universe through time can be termed cosmological evolution.

Dr. Scott presented an incredibly solid and strong case for evolution in the debate. It helped that she asserted that most people did not understand evolution and only went by the clichéd statement: "Man evolved from apes." This, in fact, is not true at all. Humans have not evolved from apes; we share common ancestors with them.

She made this point clearer by showing phylogenetic trees (these are like genealogical family trees, except that they treat each species/family/order as an individual and link it to its ancestors. The branch to which it is closest is the species with which it shares the latest common ancestor.)

"Evolution," she said, "is descent with modification. Special creation is a medieval idea from the 1600s."

The examples Dr. Scott used to make her case were very impressive. Her amusement at some of the creationists' arguments was delightful. What struck me the most about her lecture was the neat organisation of points. She went about it like my 12th standard biology textbook (albeit she wasn't boring at all, far from it, in fact) discussing each type of evidence in support of evolutionary theory step by step. I was reminded instantly of Ernst von Haeckel's Theory of Recapitulation (also in droll Bio. text of 12th standard): "Ontogeny recapitulates phylogeny." He compared the stages of a developing embryo to stages of species development. His idea (which faced great criticism due to suspicion of his having skewed the diagrams of embryos) was used to propound

Darwinism. Interestingly, von Haeckel was a social Darwinist. He believed in applying Darwinism to social groups, and to him, it implied that certain races were better than others. Scientists today scoff at that view, because globalisation has allowed different races to mingle and learn of one another's differences and similarities, strengths and weaknesses, but mostly, it has taught us all *never* to generalise. More importantly, analysing DNA sequences of all human beings has shown that 99% of our genome is the same in us all, irrespective of race. In fact, there is more genetic variation within a racial group than between racial groups.

Dr. Scott presented substantial evidence in a concise manner. The wrapping of DNA in histones, for instance, was a phenomenon she traced back to its earliest ancestral species. Every species since has had its DNA wrapped up in histones.

She used Theodosius Dobzhansky's famous quote, "Nothing in biology makes sense except in the light of evolution."

Aside from homologous organs and synapomorphies, I found that my favourite was the evidence she provided based on number of chromosomes. Considering that primates have 48 chromosomes, and humans have 46, what happened to the 24th pair of chromosomes in humans? Dr. Scott presented the amazing theory that the 24th pair in primates had been through a funny quirk and formed a centriole.

Rochester, New York

4th October, 2006: God & Other Things.

Saturday

Dr. Scott pronounced herself an atheist at the lecture that night. I remember, after the lecture, there was a question on souls, and a member of the audience wanted to know where the "cut-off" was. As in, did she expect tortoises and rabbits to have souls? Did humans have them? When did the soul *evolve*? Was it a sort of mutation? What would evolution have to say about souls? "Nothing," she said, "because soul is a religious concept. Science can't deal with it. It is a limited way of knowing. It limits itself to the

natural world. Science cannot hypothesise on soul or experiment with it. It is non-material as conceived by religion.”

Put quite simply, she said, the soul was not tangible. It couldn't be experimented with. I felt it was an appropriate answer that kept to the point of the speech and underscored her scientific way of thinking.

She did not denounce religious beliefs at all during the lecture, indeed, she cited many faith-holding scientists who were firm supporters of evolution. It is, certainly, a main selling point for the theory she supports, as well: the fact that many others who also support it are religious. Theodosius Dobzhansky, for instance, was strongly convinced that “Nothing in biology makes sense except in the light of evolution.” This was a man who was a firm believer in his faith and a staunch evolutionist. I found that very heartening, because I cannot accept the idea of abandoning faith in order to believe in evolution. While there may be authors who will try to force their opinions on their readers, I cannot support that point of view. I still think there is something bigger than the universe; there is something that controls everything, some idea to randomness. It's not human; it's the concept of a God.

Until I find out otherwise, I will continue to hold faith in it. I have no qualms in admitting that I don't know anything at all and that it makes me comfortable, and that I rely on it when I'm in need of hope and when I want something to happen, I pray. Many with whom I have discussed this have scoffed at the comfort I seek in not knowing. If I were faced with the option of being given an answer to the question of whether there is a God or not, would I want to know? I don't think so. First of all, I cannot assume to be important enough to know. Secondly, I prefer to let the question remain.

It is like Erwin Schrödinger's famous cat experiment. Schrödinger, in an attempt to illustrate to his peer physicists (such eminent men as Albert Einstein included) how ridiculous Quantum Theory was when one tried to convert it to an observable scale, designed the following experiment- A cat is to be placed in a big container, known as the Diabolical Apparatus. A glass vial of prussic acid is placed on a table, looming over the cat. If the vial were to be broken, its contents, i.e. the prussic acid, would spill onto the cat, killing it instantly (prussic acid is poisonous to the touch). The vial of prussic acid, in turn, is attached to a Geiger-Müller counter. Should it register radioactive decay of the

particle, a hammer attached to it breaks the vial. The Geiger-Müller counter contains radioactive matter, very small in quantity, such that the probability that one of the particles decays is half. As per Quantum Theory, the radioactive particle either decays or does not decay; therefore the Geiger-Müller counter either registers or does not register. Therefore, the vial of prussic acid either does or does not break, and the cat either does or does not die from prussic acid that either has or has not spilled- all depending on whether the radioactive particle decays.

Also as per Quantum Theory, the radioactive particle is only forced to choose a state upon observation. Until it is observed, it exists in any or all states. The question is the same: Would you want to observe? Would you force the radioactive particle to choose a state? Do you want to know if God exists? Or are you content with something that gives so much comfort, if not to yourself, clearly to many billions of your fellow species? It depends on who you are. As T.S. Eliot put it, “Do I dare disturb the universe?” Would you “force the moment to its crisis”? And how is the radioactive particle to make the choice? Chance? Fate? God? Canadian playwright Daniel Currie-Hall puts the “It-depends-on-who-you-are” idea beautifully: “Will you be Hamlet or Othello? Put Hamlet in Othello’s place, and he wouldn’t lay a finger on Desdemona until he’d checked his facts. Send Othello to Denmark and he’d bump off Claudius and assume the throne within a week.”

When I look back on decisions I’ve made in life, I’ve usually made them on impulse, choosing to go by my instincts rather than rationale. I’ve usually forced the moment to crisis. Why does even *hypothetically* finding out about God make me want to retreat? Simple answer: because it’s not for myself. I think of the 98-year-old *muezzin* who wakes up at 4 a.m. to call the faithful to prayer at the mosque, the coughing *pujari* who refuses to break his Vedic chants out of reverence for the scriptures, the ancient priest in a church who painstakingly puts his soul into his sermon...People who pray, with all that hope, despite the uncertainty, for the most obscure things. I remember praying for the wicket of Sachin Tendulkar, the best batsman on the Indian cricket team during many matches, desperately hoping against all hope even when the umpire raised his finger to signal the fall of a wicket, thinking “No! This cannot be true! Please let this be some nightmare instead of the truth!” Who was I even communicating with in my

head with closed eyes like people across the world do when they pray, silently sending desperate hopes out into the world and revealing their deepest and most earnest wishes? How is it that in that one instant before the umpire actually made his decision, I could feel a billion other prayers whizzing about? Think about it. What's been the most random thing you've prayed for? Love? Safety? Solutions to problems? Performance? I know a friend who prayed to do well on his exams to make his mother happy. Nobody *really* prays for material things, because with something as pure as hope, it's rarely for oneself- it's always got to do with others. We don't truly appreciate how unselfish our truest selves are. We care more for others than we ourselves can imagine, and our prayers and hopes for them are stronger than hopes for ourselves. Cynics may call it foolish, but I like to think of it as hope for this earth.

A million uncertainties simply add to how low our confidence as a species is. We are still unsure about what being alive actually means. I used to wonder about protoplasm when I was first taught about it in the 8th standard, in the year 2001. My teacher had said nobody was able to analyse protoplasm, because the instant they took it out of the cell, it 'died' or stopped being protoplasm. What is it about this magical substance that we have absolutely no clue how to study? It's so striking in its resemblance to the soul, that when I heard Dr. Scott say, "You can't put a soul into a test tube and study it," my thoughts immediately jumped to protoplasm. We haven't been able to study it either. We haven't been able to put *life* into a test tube and experiment with it either. We still do not know what life is. Is the living part of protoplasm the part that makes it a bit of soul? Am I being utterly ridiculous with these ideas? Of course, my idea is primitive and unscientific at best, and there is no apparent way to test it.

A note on the Independent Study group: We're in a course that has been developed around the Caroline Werner Gannett series of lectures that will be held throughout the year. My classmates and I are fortunate enough to be able to interview the speakers who will be coming to lecture on campus. It is quite daunting; my classmates are very mature and intelligent, not to mention they are all very accomplished students. I wish I had joined the Independent Study group in time to interview Dr. Scott. I heard she was very enthusiastic about the interview. Will be sure to interview all the others. The

next speaker is Dr. Randolph Nesse, Professor of Psychiatry at the University of Michigan at Ann Arbor.

I joined the class when I responded to the e-mail sent out by the College of Science about the course. The idea appealed to me instantly, and I contacted the professors in charge of it. I am very excited for the future speakers, especially the two Canadian evolutionary behaviourists who are going to talk about the risks of being a step-child. I feel it is particularly significant. Their work has appeared in my Intro to Bio textbook, so it is all the more exciting to meet them.

The group is studying *Consilience: The Cognitive Revolution*, and putting the creationism vs. evolution debate under the microscope. Pretty much everyone in the group believes in the theory of evolution, as do I. We had our first meeting at Java Wally's, a quaint coffee house on campus. The idea of the course is to develop itself around the series of lectures. The lectures themselves undergo an evolution. Each speaker's topic seems to take the series closer to the workings of the human mind in the light of evolution. After interviewing the speakers, we make journal entries much like this one, and these are to be submitted at the end of the year.

Rochester, New York

31st October, 2006: Darwinian Disease-
Wednesday

Thinking about animals in evolution is simpler. The idea is much easier to digest in terms of animals, plants, and easiest when it comes to bacteria and the immune system. It is somehow more impersonal, and easier on the mind. Easier still, and simultaneously logical and unpredictable is thinking about evolution in terms of bacteria. In Dr. Randolph Nesse's book, *Why We Get Sick*, this has been discussed with plentiful evidence. I felt it was commendable that he completely avoided being anthropocentric, as many do not care to do so. I was fascinated when he carried out a conversation over lunch at Aja Noodle Co. about Himalayan birds that I had seen on a holiday a few years ago, and when I had mentioned that the birds fed on bone marrow by dropping bones from a

height to break them open and access the marrow, he immediately cited a 1978 study by Reto Zach on Northwestern crows and the optimum height they reached to break open whelks. The birds who reached this optimum height did not waste energy by flying higher to drop the whelks or flying too low and requiring to repeat the flight because the whelk wasn't dropped from high enough to crack open. The interview with Dr. Nesse was quite enjoyable, particularly the discussions we had on left-handedness and whether or not right-handed people were kicking left-handers out of the evolutionary scene, since left-handers die using right-handed machinery quite often. At one point, Dr. Nesse even did a Google-search using his mobile phone. It was quite an interactive interview and I felt lucky to participate.

His lecture, titled, "Why did Natural Selection Leave us so Vulnerable to Disease?" outlined the contents of his book. His book was interesting supplementary reading for the Intro to Bio course as well. The evolutionary arms race is something I am quite familiar with. In India, we face the problem of multiple drug resistance tuberculosis (MDR-TB). I had been to see a hospital in a village nearby Hyderabad, India, where there were cases of tuberculosis. The following text is part of what I had written earlier to increase awareness of the disease after seeing for myself the plight of its victims. It is relevant to Dr. Nesse's book, and also details cooperation of the TB bacillus and HIV to kill people off within hours. I posted this on a website in April 2006:

We only have ourselves to blame for the development of MDR-TB. It came into existence because of human malpractices and ignorance. Everybody knows that bacterial diseases are cured easily with antibiotics. The problem begins when people think that simply popping pills to eliminate symptoms cures one completely of disease. They are completely wrong. Even after you've taken the antibiotics and your symptoms have disappeared, the bacteria remain in your body. They stay until you complete the *full* course of antibiotics, which most people refuse to do. They simply refuse to do it. What they do instead is to take the antibiotics until they don't experience the symptoms anymore, and think they're just fine. What they don't realise is that some bacteria still live in their body.

This leads to very grave issues, because, until now, most immunologists and doctors have been overlooking the bacteria that haven't been killed by antibiotics.

If you're familiar with what Darwin had to say on evolution, it won't be difficult to realise that only the fitter TB bacteria have survived. The bacteria floating about in your body are strong, fit and hardy versions of *Mycobacterium tuberculosis*. These are the tough ones, the ones that made it through the attack by the antibiotics. In other words, they've evolved to survive. They live on, and in time, gather the strength to launch an attack on the immune system and cause symptoms of TB again. Only this time, they won't respond to treatment from the first antibiotic used to treat it, because they've evolved. As this cycle continues, the strain of TB becomes resistant to an increasing number of antibiotics, until the infected person dies of the disease.

That isn't the worst. People will probably be laughing this off thinking they're safe because they've been given the Bacillus of Calmette and Guerin (BCG) vaccine. I was, too, until I did a little bit of reading up and realised that unlike most other vaccines, which have an effectiveness rate of more than 95%, the BCG is only effective in 4 out of 5 cases, that's 80% efficacy. Quite pathetic, in terms of vaccines. What's worse, this 80% rate of effectiveness is only in young people. So if you're above 15 years of age, your chance of developing TB keeps increasing as you age and your immunity weakens.

What's really worse? The statistics regarding TB: I got this data from a mix of websites and books, even my Biology textbook.

1. Since TB (all forms, even MDR-TB) spreads via droplet infection; a pretty effective way of making sure everyone's getting the disease; this means that if you're in contact with someone who has the disease AND shows symptoms, you've got a 25% chance of developing it.
2. Within a year, a person with TB can infect about 40 other people, if he/she leads a normal social life and meets a good amount of persons.
3. Half the people with TB disease will die of it
4. 10% of infected people will develop the disease.

5. About 30% of the earth's population has TB.
6. 5% of this 30% have MDR-TB.
7. About 20 lakh people die from TB every year.

To sum it up ominously, we're relying on a 100-year old and pathetically effective vaccine to protect us from the second most infectious disease in the world. To be fair to the immunologists, we can't really blame them for being unable to find better cures and vaccines.

This is because the TB bacterium is difficult to work with in the lab. Each bacterium takes 19 hours to multiply, on an average. Most bacteria are much faster, for instance, if it took this long for milk-curdling bacteria to work, it would take about a month or a few weeks at least to curdle a bowl of milk, when it actually happens overnight. This is a problem because it's hard to wait so long for the results of the trials of various drugs and vaccines to appear, and more often than not, these results contradict each other. It's quite a pain to work with *Mycobacterium tuberculosis*.

What MDR-TB really means in terms of what the patient faces is rather sad. The diseased are quarantined from society for two years, and a WHO official personally administers the dosage of medicine which has been prescribed (more potent than the others that the bacteria have survived, and more costly no doubt, a difficult proposition in developing nations like ours) and makes sure the diseased person takes the medicine in their presence (DOT TB control strategy- **D**irectly **O**bserved **T**herapy, which means it's supervised by a WHO official, who will probably be wearing one of those masks and will treat you like you've got a horribly infectious disease, which, in case you've forgotten, you do have in case of MDR-TB!)

The treatment is like taking two years' worth of chemotherapy for cancer, and antibiotics can bring you down and weaken the body. You're kept away from society, something of an anathema who can infect everyone else. What issues this can invoke in the psyche of the person are hard to imagine. Prison for a crime you aren't even aware of committing.

Meanwhile, this nasty little bacterium has decided to team up with HIV, the virus that causes AIDS. It's very easy for the TB bacteria to infiltrate and attack a person who is immuno-compromised, i.e. has a weakened immunity. The result? People with AIDS who contract TB, particularly MDR-TB, can die in a matter of days, even hours.

This partnership is dangerously lethal to humankind. I wish all of us were educated enough to protect ourselves. To do so, we must all be careful with ourselves. I want to be sure that you don't get me wrong. People with TB and HIV or AIDS are not to be treated insensitively. You won't catch their diseases simply by being around them. As a society, we need to show these people that we care, and that we are working to improve conditions for them and to prevent the disease from spreading. I think awareness is the best way.

Stanford, California

November 30th, 2006: Depression as a Function-
Thursday

My last journal entry mainly discussed with the evolutionary mechanisms that Dr. Nesse explains to propound the useful concept of Darwinian medicine. While he may be a pioneer in the U.S., it is important to remember that many others have also recognised the potential of this field. Researchers and doctors in Goethe University in Germany is using combination therapy to mix and match from the 19 available AIDS drugs in the market to do whatever they can to prolong the lives of those infected with HIV. Their idea is to bewilder the virus by constantly forcing it to evolve to resist whichever antibiotic they're giving it, and allow it to lose resistance, so it has to focus on evolving instead of attacking the immune system and the making the person show AIDS. They are prolonging the incubation period of the virus.

One very important aspect I have not discussed yet, simply because I wanted to think it over further in my mind to get a clearer picture, is that of Dr. Nesse's ideas on

depression. His article was very clearly in favour of evolutionary psychologists' insistent claims that our behaviour reflects our genes more than anything else.

He seemed to say that depression had a function, which was to prevent the individual in question from undertaking a task they were likely to fail, at grave costs to their reproductive fitness. His backing for this is that our ancestors would have needed something to deter them from undertaking costly tasks, some opposing force to their motivation, if you like, that would prevent them from perhaps even getting themselves killed. While I agreed with Dr. Nesse completely in his clear presentation of evolutionary mechanisms, in this aspect I find his ideas difficult to accept. I really do not want to sound arrogant on this matter, but I cannot accept that human beings have no free will that allows them to feel depressed to grieve for their dead, or no free will to feel for someone else, or simply be depressed for no absolute reason. Rejection can cause depression. Stress, can cause it, body image, failure can cause it, fall-outs, exams, the birth of a child- all factors that have been known to lead to depression. Depression is not as narrow a concept as Dr. Nesse makes it out to be. It is astonishing that an accomplished psychiatrist such as he does not seem to be able to look beyond the restrained view of human emotions. It's more than just that. The death of a parent, or of a sibling, or any loved one can cause the deepest grief and depression known to us. What evolutionary benefit could that possibly have? There is such a vast range of human emotions during depression; it is surprising how insensitive he is to all of them in his article and matter-of-fact manner of talking of it in the interview. What of people who are so depressed that they commit suicide? Isn't that absolutely opposite to his suggestion that depression actually might have a function that saves fitness?

I did not find his perspective clear in the least. The article, too, went over my head after the beginning. Call it being an obstinate jackass, but I refuse to reconcile to the fact that if I should ever be depressed, it's because it is preventing me from taking up a task that I cannot handle. I would like to think that even if I can't help feeling sad about something; that it is because of things which have happened, and not because of how my genes are wired. Depression is much more than that. Humans are more than mere machines which let their genetic codes dictate their lives.

Through the interview, lunch and lecture, I wished Dr. Nesse had elaborated on the evolutionary origins of emotion. This is a topic I find most fascinating. It is also in keeping with the promise of the CWG series in focussing on the human mind and its evolution. It is, as Dr. Nesse talks about in his book, the question of looking for ultimate causes of how we behave rather than proximate causes. I am not sure that ultimate causes explain every aspect of our behaviour. That idea seems very restraining of the entire range of human emotions. What evolutionary benefit could emotions like patriotism, honour or valour have? How could developing something like a sense of humour save your fitness or increase your chances of survival?

I'm holidaying in Stanford University, where my sister is pursuing an MS degree, during my Thanksgiving vacation. Have been lucky enough to attend a Decision Analysis class taught by the well-known Professor Ronald Howard, famous for coining the word 'micromort'. (Incidentally, Dr. Howard also heads a very interesting religious discussion group at Stanford, which I also had the good fortune of attending, and he is a practicing Buddhist). A micromort is the one-in-a-million chance of being killed. It is calculated by factoring the probability of death in a particular activity, the amount of money one would pay to avoid it (reduce the probability, essentially, because one can never avoid it completely by 100%) and the amount one actually *can* afford to pay in order to eliminate the risk. It is quite interesting to see the lengths to which some will go to avoid death. One student in the class was willing to pledge 50 million American dollars, obtained by hook or crook, loan and sale, to save himself. Why on earth would he *want* to save himself to live in a debt of USD 50 million? Is the will to survive so strong? Is his thinking influenced by his genes? I do not know if that theory gels with my views of the human mind.

The next speakers in the series, Dr. Martin Daly and Dr. Margo Wilson will be talking about the risks of being a step-child. I have an excerpt of their book, *The Truth About Cinderella*, which Professor Broe handed out to us at the last meeting. Must get down to reading it this weekend before the interview. From what I have read so far, they seem to subscribe to the theory that what we do is largely for evolutionary benefit. I am very much looking forward to meeting them.

Canandaigua, New York

February 17th, 2007: All step-parents? Really?

Saturday

We had three lectures since my last journal entry: The first speakers, on the 6th of December of last year, were Drs. Martin Daly and Margo Wilson, Fellows of the Royal Society of Canada and Professors in the Department of Psychology, Neuroscience and Behaviour. I very much enjoyed their speech, and also more than anything, found them to be delightful people. They were very warm, friendly and up for a laugh with us students. After them, Dr. David Sloan Wilson presented his theories on Evolutionary Social Constructivism. The third speaker, Dr. David M. Buss, is a sensational writer, and he was here only about a fortnight ago. This quarter has been hectic, so I'm using this weekend to detail my thoughts on the lectures so far. This is going to be a long journal entry, but it should hopefully wind up organising my ideas on this course so far.

Firstly, I want to pause and take a look at how the CWG series is evolving. As time passes, the series is shifting its focus from what evolution really means to how it has changed the way humans think. It is exploring human action and emotion. Drs. Daly & Wilson, for instance, discussed their book, *The Truth About Cinderella*. Their findings, after close scrutiny of statistics involving abused children, were that being a step-child posed a monstrous threat to fitness. I will admit that when I first read *The Truth About Cinderella*, I found myself agreeing with their views, because they were very convincing in their manner of putting things across. Call me easily swayed, but it was so difficult to see the other side of things, especially after reading about how it's been a concern in *every* culture, a sort of convergent evolution of ideas, if that is an acceptable way of putting it.

Interviewing Drs. Daly & Wilson, I asked them many things I'd wondered about while reading their book, for instance, what of baby-swapping cases, when the parents don't know that their little bundle of joy isn't really theirs? What of cheating wives who fool their clueless husbands into thinking the child is theirs? See, that is why I believe step-mothers have the potential to be far worse, because they *know* if the child is theirs.

Step-fathers might be worse, too, I wouldn't know, but I can somehow see men more accepting of children who are not their own. Of course, they responded that it was difficult, quite nearly impossible to test these phenomena, as there were no statistics of baby-swaps and infidelities. That is true. However, why, then, did they choose to look into the statistics of abused children? While it is a good place to start, shouldn't the statistics of all children with step-parents and rate of abuse in those cases provide more basis for forming such conclusive theories? And what of ordinary parents who are low enough to abuse their children? Let me not be the one to rush to the defense of step-parents. I would never wish that situation upon *any* child. No child should ever have to go through anything like it.

Even from what I feel about the issue, I want to try and take a step (no pun intended) backwards and look at the issue objectively instead of letting my feelings on the matter impede what might be a holistic and liberal thought. There are many children who are perfectly content with their step-parents. There are many step-parents who love selflessly, as they would their own children. The most heart-warming story, I think, and one that has given me a lot of comfort, and indeed is what makes me able to look at the issue without any bias, is so beautiful that I feel I must include it in the journal. If you're familiar with the film *Love Actually*, you will remember the little boy, Samuel, whose mother Joanna passes away when he is very young. He is left with his step-father, Daniel. The relationship between these two, is very heartening and exceptional. Daniel becomes the exemplar of a father to the little boy after his mother's passing, fulfilling his every need in life. He's unafraid to hug, talk, encourage, cuddle, laugh and joke. He becomes everything a good father should be. He is not fussing about his genes and waste of resources, as he could be expected to as per the theories put forward in *The Truth About Cinderella*. Another case (pop culture, again) is of the film, *The Birdcage*, where the boy's birth mother couldn't care less about him, and spends 20 years without so much as a "Hullo!" or a "Happy birthday!" whereas his homosexual father's spouse, Albert, cares for the boy as much as any mother possibly could, fussing over the state of his laundry and doing everything in his power to ensure his step-son's happiness.

Yes, these are movies, and do not represent the statistics of abuse. But it is more than just what I feel. There is an entire world of people with diverse feelings on this matter who are much more important.

My own explanation for this issue is that it is more due to the stress that both parties, step-parent and step-child, face in the new situation that causes erratic and sometimes violent behaviour, which admittedly, might arise from both parties. It has nothing to do with genes or evolution. Humans may manifest such macabre tendencies as alpha males of lion prides killing off step-cubs in the actions of baby-beating step-fathers and poisonous step-mothers, but we are sapient not only of ourselves but our surroundings and our interactions with other humans. I only wish evolutionary behaviourists were more willing to accept that there are things far greater than genes when it comes to behaviour. They underestimate the power that an upbringing can have on a child and the human being that he or she becomes. Not only upbringing- education, environment, travels, people, siblings, observations (and, again, what they have been brought up to be sensitive to and pay attention to) profoundly affect their actions and can make them gentle, giving, kind and loving individuals, or beastly, pathetic excuses for human beings with as much sensitivity as a vegetable peeler. It all depends on the individual. Generalisation is gross negligence.

Canandaigua, New York

February 18th, 2007: Independent Decision-Making-
Sunday

Continuing from last night's entry, I'm going to try and finish detailing what I thought of Dr. Buss's lecture. It is perfect to be vacationing this weekend in Canandaigua in the middle of a strenuous quarter. For now, on with the discussion of speakers-

Dr. David M. Buss wrote a very sensational book called, *The Murderer Next Door: Why the Mind is Designed to Kill*, about why the mind was designed to kill. He propounds Homicide Adaptation Theory, which states that murder is an evolutionary stratagem and our ability to perform murder as a species has evolved from our ancestors'

ability to do so and benefit in fitness. The book, *The Murderer Next Door*, was disturbing to say the least. The accounts in it are graphic in violence. I am not at all accustomed to hearing of people with such violent thoughts.

Dr. Buss was interesting to interview. This was at a point of time when I seriously felt that the course was beyond my understanding and intelligence, so it was a huge relief to be able to ask questions that did not sound stupid, as I was so afraid my questions at Dr DSW's interview had sounded. In particular, I wanted to know about the evolutionary benefits of different types of murder. How, for instance, is suicide evolutionarily adaptive? If life is too painful, it is understandable why some people choose to kill themselves. It might lessen the burden on people they love the most and it might give them respite from a life which is nothing but troubled. It is fully understandable.

How can anybody seriously hammer on about it being caused by the genetic hardware? It is bewildering, and I cannot accept such a restraint upon human thought and decisions. I might sound banal, the way I'm going on about this, but I cannot believe that human beings do what they do because of what genes they have. Firstly, for that to be true, there needs to be some sort of evidence that extends through successive generations. The behaviour needs to be an established pattern and there has to be something about it that either imprints upon the young or causes some sort of mutation that makes them innately behave in that way. There is no such evidence. Evolutionary psychologists are merely taking the easy way out in proposing these theories. It is dangerous, because there will be many who take their views seriously and go about life believing such theories. "Murder, because of my genes, your honour," is going to be the next thing we'll all hear at the Supreme Court. "I was unfaithful to the marriage because my genes made me go for the fitter individual", "I beat him up because he doesn't have my genes and I couldn't give a hoot what happened to him", "I raped her because I very badly wanted to pass on my genes", "I stole all his money because my genes made me try to get resources required to attract a mate by hook or crook", "My genes made me."

Does it not sound ridiculous? Any sane person would have stopped reading before it got to a point where it began to sound as if we were all mere puppets in the hands of genetic make-up, and our experiences and upbringing counted for nothing. Consider murderers- most of them have had disturbed childhoods. Rare is the loved murderer,

rapist or recidivist. Why, even people with horrid childhoods grow up to be sane and loving parents. At the end of the day, what we are taught by life and the attitude we develop to it makes us who we are, and in turn, affects our actions. If this were not true, why should children be given an upbringing anyway? Why not just let their genes take over? Why do we look after children? For kicks, I'm going to answer this like an evolutionary psychologist would, and try to explain why I feel their answers so lacking. I can understand their answers applying to some animal species, as they do not always focus as much on upbringing as human beings do. It boils down to the question of nature vs. nurture.

After all, human beings are social animals. They develop best when they interact with one another and form relationships. There has been much difficulty, especially in recent times, in clearly stating what it is that makes us human. Jane Goodall's studies of chimpanzees showed that they, too, were able to use tools. Fossils have since been discovered, of Neanderthals that were clearly capable of speech. Dolphins are said to be able to communicate as effectively as humans. What sets us aside from the rest of the animal kingdom?

There is no clear answer. Humans *are* animals. They have shown themselves to be just as savage. One can validate this claim by merely considering film evidence: The crooks in *Hannibal Rising* who cut up baby Mischa Lecter and ate her during World War II. The instance of Commodus, Emperor of Rome and son of Marcus Aurelius, relishing the blood and gore of the amphitheatre in *Gladiator*.

There is an abundance of information to disagree with such claims. Humans should be characterised by their gentleness, as are lots of other animals. I have not seen anything as gentle as a dog supervising her pups as they play, gently pulling them apart to prevent them from hurting one another. In fact, I often think humans are quite barbaric in behaviour. Humans are the only species on earth where individuals force each other into sexual intercourse. Humans are the only ones so cold and calculating as to have assassinations and murder of innocents, and are the only species with such a shrewd ability to deceive.

Even so, humankind is exceptional in the care that it provides to its young. This care has evolved through the ages. It has come about with a mix of other evolved

cognitive tendencies. Consider memories, for instance. Our ability to love with the intensity that is so evident is due, in part, to our ability to remember. We care for our sick and infirm despite their 'reproductive uselessness,' in terms of evolutionary psychologists, because of our memories of them and our hopes for their future.

Caring for children, too, has evolved through the millions of years of human evolution. The young of any animal, however repulsive its adult form may be, appears to the human eye to be adorable and worthy of caring. It is the tendency of humans to nurture. Primitive cave people perhaps sat their children on their knees and taught them to draw on the cave walls. A random cavewoman might have thought it a good idea to allow her little cave child to interact with another cave person's child, and so began the idea of human play. The proximate explanation is simple enough. We care for our young because we love them, and our memories of them and hopes for their future make us want to enrich their lives and let them live freely while keeping them safe as possible.

The ultimate, and evolutionary explanation, then, is one that traces the origin of love as our species evolved. And, indeed, as lots of other species originated. What is our relation with the dog, for instance? As it became more domesticated, it became more capable of love. Indeed, dogs have sacrificed their lives for their caregivers, and will not hesitate to protect them from any harm, beehive, drowning tide or armed attacker. My pet, Noonie, will loyally raise his hackles and growl at anybody, even if they are our guests, if they dare to raise their voice to me. Such loyalty and unconditional love is rare, and I don't even have my dog's genes. I'm not even the one who feeds him; the servants do it! Why should he want to protect me? I'm not his offspring, nor his resource provider. I have merely given him a lot of affection and fun times through the years, and this is of little value in terms of reproductive fitness. Yet he values it nonetheless, much like I value with all my heart the way his little Dachshund frame roars with all the might of a lion should anyone try to lift a finger or be even remotely threatening in my presence.

Anyhow, the ultimate explanation is that of genes. Our young contain our genes, and we feel the need to protect them and care for them in order to have them pass on our genes. That is precisely what an evolutionary psychologist would say.

However, I feel this explanation is shockingly lacking in the light of human-human interactions. Why, then, do soldiers give up their lives for their fellow soldiers in

battlefields? Why do we, at grave costs to ourselves and to our reproductive fitness, care for step-children with as much love and affection as we would show to our own? Why does a cuckoo drop its eggs off in a crow's nest and why does the crow take care of it? Why do people perform "honour killings"? Why genocide? Why war? Why do people die for principles or for country? These and myriad other questions remain to be answered. Is the mind too complex to understand itself? If, as evolutionary psychology suggests, nature vs. nurture does not make a difference, why educate and care for children at all? If everything is instinctive, is nurture immaterial? Why, then, is it our instinct to nurture?

This instinct to nurture extends not only to our young, who carry our genes. It can extend to pets, friends, orphans and any creature that looks like it needs to be cared for. The gene rule lies, and I do not believe it. I think it's slipshod and treats freedom and evidence of human emotion with light-fingered contempt.

San Francisco, California

March 5th, 2007: Unnecessary Violence-
Monday

The gruesomeness I cited previously still exists and upsets me greatly. I do not like to think of human beings as being anything but gentle creatures. For instance, I wish people would look into themselves carefully and look at why they are able to hurt others, whether emotionally or physically. Also I want people to consider why they think it fit to pile their plates with chicken wings and throw the plate away untouched. Such scant respect for the animal which has died is vile. Personally, being an ethical vegetarian, I recommend it to everybody, but lots of people have called that ridiculous. It is high time human beings stopped being so pompous as to believe other animals exist for our benefit. We killed off the Greak Auk by eating it. How many other species are to suffer this fate? Our violence towards other creatures, simply because they are not human, is shocking. American laws do not spare pet dogs, either. Once a dog bites someone, it is so disturbingly easy for them to have it put down! I think it's outrageous. Nobody looks at the unselfish love that the dog gave unconditionally. All they see is the temporary hurt it

couldn't help causing, after all, it is 'in the dog's genes' to behave that way. Why all this killing? Why are humans so keen to cause hurt, not only to each other, but to other creatures? No, I want humans to be careful with each other and the creatures on this planet. I do not know about having the "right to kill" but I do understand that just as I would not want my life cut short, because I enjoy life so much, I would not want to cut short anybody else's life.

I have found this behaviour more pronounced in this country. One of the reasons I think this is so is because it is under such strict laws, everybody is so protected, animals as well, and people live in cocoons. The country itself is so isolated from the rest of the world, that people here do not see the violence of war, and children here are growing up unaware of risk and true violence, that they compensate for all of that by being violent to one other and to hapless, innocent animals. I shudder to think of all the murders that would happen if even a handful of such violent and angry citizens were let loose in a country like mine, where railways are open and anybody can hop onto a train or bus as they please. Animals are free to walk about on roads, and we do not think we can kill them simply because the roads were built by humans. We stop our cars to let the animal pass. I would like to see such respect for all forms of life in every land.

Which is not to say that the gruesomeness does not exist at home. It certainly does. Fifteen percent of our population slaughters sheep every Eid-ul-Zuha, by letting them bleed to death. My friends delight in firecrackers made by impoverished children from Sivakasi who have been sold as bonded labourers to firecracker manufacturers. I once watched the gardener capture a pigeon, wring its neck (I still remember the sound its bones made as he snapped it) and remove its feathers to cook it for his lunch. No, certainly everyone is not gentle. I'm being thick in making it sound like there is no violence there. I have simply been sheltered from it as far as possible. It is jolting but very educative to live life independently and be made aware of cruelty that humans are capable to inflicting upon other living beings.

For instance, the cruel beggar I came across yesterday at the Bay Area Rapid Transport station near Mission Street in San Francisco, whom I watched, from a safe distance, as he made use of the gorgeous spring sunshine and an old magnifying glass to finish off a line of ants walking on the road. Not wanting to irk his ire, I left him to it, but

wondered, what does the life of an ant mean? How would he like it if *his* life ended in somebody's venting session? Why did he *want* to kill them? Why does anybody want to kill?

For instance, in a lab that could just as easily be performed using other types of tissues that do not require the killing of an animal, there is an insistence to have students kill an un-hatched chicken. In dissections in labs, students think little of killing cockroaches and frogs. Please do not misunderstand what I am saying. I fully support scientific research, and the harvesting of stem cells from biomedical waste. What I do not agree with is our presumptuousness in dragging innocent animals into it. What about the numerous aborted human embryos? Why kill when you can use those aborted embryos instead? And this is not to say that I think people who abort their embryos are wrong. It is completely their choice.

For that is what is the meaning of being liberal and free in thoughts and ideas: to understand the perspective of the other person and allow them full freedom to make whatever decision they please about *their own* life without any form of interference, impedance or imposition. While I may never choose to abort an embryo because *I* do not believe I have the right to do so, I fully support another individual who believes they are doing the right thing. It is this distinction that few people seem to be able to make; they think anybody with ideas is out to impose them upon others. Most are quick to paint things in black and white, when, more often than not, things are in shades of grey.

Clearly, when there are people who are capable of accepting that everybody should be free to make their own decisions, how can people continue to believe that we do what we do and think what we think all in terms of genes?

Rochester, New York

April 28th, 2007: More than Memes-
Saturday

I had been looking forward to Daniel C. Dennett's lecture and interview immensely. I must say that it was a great speech and I particularly enjoyed some of the

questions the audience posed afterwards. Of the lectures, I delighted in the way he stuck to Darwinism above the usual way in which the evolutionary psychologists had all done. The interview, too, went off smoothly. Was terribly daunted to attend the dinner because there were no students around, but managed to go through with it without a nervous breakdown, thank goodness.

From the title of the book, I had expected *Freedom Evolves* to be my sort of book, believing in free will and freedom of decision more than the hardwired-genes-evolutionary-psychology point of view. However, it spun a tale of memes and made them as analogous to genes in evolutionary psychology as tea : leaf :: coffee : bean. It's as though nobody amongst the authors seems to believe that the human mind can think for itself without the influence of genes and memes! My God! What next? *Geges*, the influence of computer-generated programmes? Or *Teves*, the effect of the telly on human thought? It's reaching the point of being very, very difficult to accept and very restraining on thought. Even pseudo-free-thought advocates have turned out to be unable to see the human mind as free, and insist upon placing restrictions such as memes upon them.

I had an interesting conversation with my classmate about this, and he said that people like Dawkins and Dennett were in danger of preaching to the uneducated and convincing them of things that were not necessarily true, merely because of their way of putting things across.

I do not mean to be so contrary. I realise now that it reads so in everything I've written so far in this journal. It is simply that we were always taught, as students of life science, to never take anything about life or nature for granted- there will always be exceptions to any rule, concept or idea. It is the freedom that nature allows for these exceptions to exist that I want to incorporate into my thinking.

I see anything that tries to make human action predictable as a threat to exception, which would be better off cherished, *I* feel. There really is tremendous beauty in exceptions. It is up to us to find it, instead of trying to restrict our behaviour and that of nature's into rules, or trying to say that it is dictated by genes and memes.

Cultural ideas are important, yes, and they *are* transmitted based on their popularity, but what of the rebels? As long as there is that one thinker who will process an idea, and, instead of accepting it as every ant does a lance fluke (and this has not and

cannot be proved- how do we know that every lance fluke is able to control every ant?) rejects the idea because it doesn't make sense to that individual thinker? As long as that thinker exists, I feel claims of predictability are futile and restricting of freedom, for should word spread, these thinkers will be discouraged.

One wonders, then, about the exceptions that Nature discourages, and why she does so. Species which do not survive, seeds which do not sprout, flowers which do not bloom- trying to find reasons for every exception is a huge waste of a life that can otherwise be enjoyed, I feel. However, I would immensely enjoy it if I were to hear from someone who wishes to dedicate their life to these exceptions and tell the world why- it will require time travel, I think, because the simultaneous nature of these exceptions will cause many to be missed. While this individual is busy trying to find reasons for all these exceptions, I'll be happy to continue being charmed by the remarkable exceptions of this individual life.

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