



Science and Faith

"... through Him and for Him" (Colossians 1:16)

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Feature article

Evolution and Theology

Asa Gray

"The attitude of theologians toward doctrines of evolution, from the nebular hypothesis down to "Darwinism," is no less worthy of consideration, and hardly less diverse, than that of naturalists. But the topic, if pursued far, leads to questions too wide and deep for our handling here, except incidentally, in the brief notice which it falls in our way to take of the Rev. George Henslow's recent volume on "The Theory of Evolution of Living Things." This treatise is on the side of evolution, "considered as illustrative of the wisdom and beneficence of the Almighty."

Gray (1810 - 1888) was Fisher Professor of Natural History (Botany) at Harvard University. This except is taken from *Darwiniana: Essays and Reviews Pertaining to Darwinism* (1878) D. Appleton and Co., New York.

Consider the creatures

Butterflies, beauty and brains

Mike L Anderson

Several things may come to mind when a beautiful butterfly flutters by - say frivolity, leisure or transience. A brain is not one of them. Yet, actually, strategy is going on. The naturalist W. H. Bates lamented that butterflies were "creatures selected as the types of airiness and frivolity," but predicted that their study would eventually become greatly valued. Is there really something clever going on with butterflies when they flutter about? If so, how did a creature with a neural knot for a brain stumble upon it? Could we humans learn something from them about life tactics?

It turns out that some rather difficult challenges have been solved in butterflies. To appreciate the problem we have to put ourselves in their little shoes. To a butterfly, a vacant plant is a bounty. It is a little like a human finding a loaf of bread the size of a building. If they prayed it would be, "Give us this day our lifetime supply of bread." It would mean enough food for her many offspring for virtually their entire lives. They



couldn't move without stepping on it. No need to be very mobile. In fact, it is better not to be, in case the insect misplaces the food plant. What, then, is the problem? The trouble is that for such a little creature, vacant plants are very widely separated from each other. To find one in the first place requires much mobility. The insect needs to be mobile, but it also needs to be sedentary. Conflicting demands are placed on it.

An extreme lifestyle

What to do? Does it do just one or the other or go in-between? Neither. It has a better tactic - do sedentary during one phase of its life and mobile in another. It has a radical division of labour in its life-cycle called complete metamorphosis. The creature starts its life as a sedentary, celibate, feeding machine - the caterpillar. The young caterpillar eats many times its body weight in a single day. Talk about extreme eating! In the larval stage, it may look primitive and worm-like, but it is actually a very adaptive, advanced condition.¹ During the pupal stage it is about as mobile as a plant. During the adult stage, the butterfly is a flying, frugal, extreme sex machine. Monarch butterflies travel thousands of kilometers² and lay hundreds of eggs. Many species of butterfly do not feed at all as adults. Talk about extreme dieting! The focus is on finding food for one's offspring, not eating it. Metamorphosis is a strategy for dealing with rich, but highly dispersed food sources and is a marvellous method for coping with opposing pressures.³



Butterflies have parallel strategies for other opposing pressures. For instance, they need showy wings to attract mates, but camouflaged wings to avoid being seen by predators. Do they go just brightly coloured, cryptic or in between? Some species have discovered that the best strategy is neither. When fluttering around a mate to impress, they display the gaudy upper sides of their wings. When sitting still for concealment, they fold their wings, hiding the upper sides and displaying the drab colour of the undersides.

The insects that do the "both/and" strategy such as the beetles, flies, bees, wasps, ants, butterflies and moths and are supremely successful. They account for the majority of all animal species!⁴ Maybe, just maybe, they are onto something.

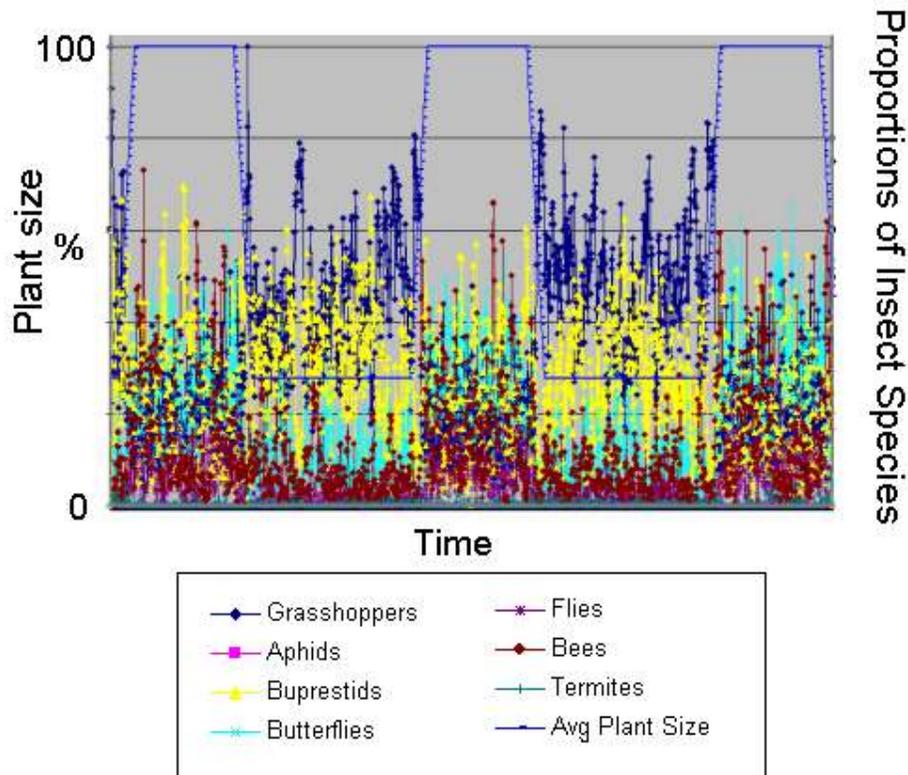
How did a beauty come up with such a brainy strategy?

It cannot be through the butterfly's brains because it does not have much. We have to look higher – just God maybe, or just evolution or something in-between? Let me suggest, neither – that both God and evolution are behind metamorphosis.



I have created an artificial life simulation program called *Metatopia* that illustrates how this can be so. (It is available on my website www.mikelanderson.com). *Metatopia* is a little world of plants and insects that mutate and evolve (see screenshot). I wanted to see whether evolution could produce the butterfly. It did! When plants are small and close together (think grass), insects such as grasshoppers predominated (see graph below). As plants increase in size and become separated, butterflies and other insects with complete metamorphosis evolved. In effect, the larva evolved stubby legs and the adults, wings. Not only that, the adults became more reproductive and transient just as they are in real life. Even sociality evolved- so termites and bees appeared. I used chance and selection to provide a system whereby insects can hit upon their own solutions to their problems.

Plant size vs Proportions of insect species



We rightly acknowledge the genius of Charles Darwin for discovering evolution through natural selection, but what about acknowledging the One who invented it all in the first place?

Why let the system come up with the solution rather than designing the creatures directly? One reason, in a word, is love. Well, a hint of love in the case of *Metatopia*. This is what compelled me to give my insects their own independent existence. I wanted to liberate the creatures to come up with solutions - or not - on their own accord. There was satisfaction in giving them this autonomy. It is as if they had their own free will. I wasn't sure what would happen and there are aspects of the outcome that I still do not understand. Creating an open-ended little world was fun!⁵

Similarly, God has lovingly created a world of autonomous creatures and humans that can make their own choices. While the universe ultimately depends on God for its existence, it is important to God that his creatures have genuine freedom. God's love compels him to be an intelligent Creator rather than an intelligent designer. God has brains *and beauty*.

Butterfly wisdom

While we have the God-given gift of freedom to decide whatever course to take, not all decisions are equally valuable. The apostle Paul says, "Everything is permissible for me" - but not everything is beneficial."⁶ Marcus

Cato, the Roman statesman said, "Wise men learn more from fools than fools from the wise." Could something be gleaned from fluttering butterflies concerning making strategic life decisions? I think so. I think they illustrate wise life skills.⁷

1. "If nothing ever changed, there'd be no butterflies," goes the saying.

Butterflies suggest that change can be a good thing. Change is part of life. Each stage has its challenges and its benefits. Proverbs says, "The glory of young men is their strength, gray hair the splendor of the old."⁸

2. When conflicting demands come our way, do things in stages.

Metamorphosis, remember, is a marvelous method for coping with opposing pressures. A caterpillar fixating on flight is not going to eat very well, and a butterfly fixating on munching leaves is not going to fly very well.

Even the Son of God has conflicting pressures. His power demands that he be eternal, everywhere, all-knowing and unfathomable. His love demands that he be temporal, localised, limited and up-close and personal. Does he do one or the other or something in-between? Neither. He did it in stages. He was infinite in eternity past. God Incarnate became confined like a caterpillar. Then he rose again and flew into each of our hearts so that the beautiful Spirit of Christ could reside within us.

If butterflies and Jesus do things in stages, perhaps it is a good strategy?

Even Jesus needed to rest from work. Even he took a catnap on a boat in a storm! Even he needed a time to grow and a time to fly. He only started his ministry at around thirty years old. Before that he was growing "in wisdom and stature, and in favor with God and men."⁹ If he had started earlier, would not many more people have heard his message from his mouth? Would not many more people have been healed? Yet Jesus had an acute sense of divine timing, saying, "My time has not yet come," when pressed to become involved too early.¹⁰ When the crowd wanted to make him king by force, he withdrew.¹¹ When the crowd threatened to throw him off a cliff, he escaped.¹² It was only on the night before his death that Jesus prayed, "Father, the time has come."¹³ Jesus knew when it was time to rest, time to grow, time to leave, time to minister, time to die and time to be king.

So does the Father. He has established a "covenant with day and night and the fixed laws of heaven and earth."¹⁴ In separating night and day, God gave us well-defined periods of sleep and work - mini-stages if you like. What do we do? Do we make hay while the sun shines, but hit the sack when it does not? Or do we switch on the light to extend the day? Most South Koreans begin work at 8 am and end at around 10 pm or later. Employers have converted their people into beasts of burden. Modern conveniences have desensitized us

to nature's cycles. Do we rest poorly because we feel guilty about resting even after the sun is down? And do we work poorly because we are too tired from insufficient rest? Are we moving towards a halfway zone between rest and work?

It was always thought that hunter-gatherers needed to work long hours just to survive. How many in the workforce were lulled into thinking they were better off than their ancestors? However, research has revealed that hunter-gatherer societies today have a workload averaging less than five hours per day.¹⁵

Psalms says, "In vain you rise early and stay up late, toiling for food to eat-- for he grants sleep to those he loves."¹⁶ Not that we have to religiously follow the sun. We can be flexible. God created the sun for us, not us for the sun. Perhaps we can be flexible enough to set an alarm to prompt us to take a lunch-break. Is it not best for productivity to confirm appointments with the bed at night, the couch on your day of rest, the river-bank on the long-weekend fishing trip and the chalet for the holiday? It is not beauty sleep - it is strategic sleep.

3. Caterpillars do caterpillars well, but butterflies badly and vice versa.

It has been said that "In childhood, we yearn to be grown-ups. In old age, we yearn to be kids. It just seems that all would be wonderful if we didn't have to celebrate our birthdays in chronological order."¹⁷ But if I hanker after the advantages of another stage, age or season, I may miss the opportunities of the current one.

"There was no respect for youth when I was young, and now that I am old, there is no respect for age - I missed it coming and going" wrote J.B. Priestly. The Apostle Paul said to Timothy "Don't let anyone look down on you because you are young."¹⁸ What the young lack in experience, they make up for in energy. What the elderly lack in vigor, they make up for in wisdom. Job asks rhetorically, "Is not wisdom found among the aged?"¹⁹ If gray hair is a crown of glory,²⁰ wrinkles are the pleats of a royal robe.

Incidentally, Job says only a few verses earlier, "But ask the animals, and they will teach you."²¹ If butterflies are anything to go by, I can never be too young or too old. I am always in the prime of my life because each stage of life is a vital part of God's scheme of things. Perhaps when I covet another age I should remember this: I am exactly the age God wants me to be. When that stage called death approaches, our very failing faculties can serve a great purpose. It can remind us that that our value in God's eyes does not depend on our performance. It can remind us that the next stage is eternity. It can remind us that even the Son of Man experienced transience. And even he needed to pass the baton on to others. John Milton said it so well as he went blind:

"When I consider how my light is spent
E're half my days, in this dark world and wide,
And that one Talent which is death to hide,
Lodg'd with me useless, though my Soul more bent
To serve therewith my Maker, and present
My true account, least he returning chide,
Doth God exact day-labour, light deny'd,
I fondly ask; But patience to prevent
That murmur, soon replies, God doth not need
Either man's work or his own gifts, who best
Bear his milde yoaik, they serve him best, his State
Is Kingly. Thousands at his bidding speed
And post o'er Land and Ocean without rest:
They also serve who only stand and waite."

4. Wisdom can be found in humble places.

A little butterfly flitting about may not seem like much. It follows what we disparagingly call "blind instinct." But, instinct is the culmination of millions of years of evolution. There is wisdom behind the butterfly's timely cycles between work and rest, feeding and reproducing, walking and flying. Instinct may be short-sighted, but culture can be worse. Entire nations can rise above instinct into craziness. One can get more strides in per unit time by running than by walking. So, for the sake of productivity, the Chinese run everywhere - frenetically. The government is so concerned that it has instituted an annual Go-Slow Day.

Jesus may well have run when the crowd tried to throw him off a cliff. The rest of the time it seems he believed he could accomplish the Father's mission at less than a hectic pace. Perhaps sophisticated cultures can learn something from the humble carpenter?

Outwardly, this man from an obscure village may not seem like much. Unlike the butterfly, Jesus "had no beauty or majesty to attract us to him, nothing in his appearance that we should desire him."²² However, he was the culmination of a strategy developed by God in eternity.

Why would God use such an odd strategy? Is it not to shame those who are wise in their own eyes? "Where is the wise man?" asks Paul. "Where is the scholar? Where is the philosopher of this age? Has not God made foolish the wisdom of the world? For since in the wisdom of God the world through its wisdom did not know him, God was pleased through the foolishness of what was preached to save those who believe. Jews demand miraculous signs and Greeks look for wisdom, but we preach Christ crucified: a stumbling block to Jews and foolishness to Gentiles, but to those whom God has called, both Jews and Greeks, Christ the power of God and the wisdom of God."²³

It is a strategy that works. I saw an almost cordial debate on the Internet in which a skeptic almost warmed to the idea of a deistic god arrived at through sophisticated scientific reasoning. Then his opponent brought up Jesus. His reaction reeked with disdain. "It's so petty, it's so trivial, it's so local, it's so earth-bound, it's so unworthy of the universe."²⁴

Jesus is not good enough for everyone and that is what God wants. How could I have the gall to try to improve on Jesus? That humble Caterpillar from Nazareth came to fulfill a deep, divine strategy and all in good time.

5. The butterfly is only outwardly doing nothing during the pupal stage.

The pupal stage seems very counter-intuitive. While wrapped in the chrysalis, the insect cannot feed, fight or flee. And if you looked inside you would find larval tissues literally dying.²⁵ Yet, this stage is essential to the overall strategy. For the butterfly to fly, the caterpillar must die. Far from nothing happening, a most amazing transformation is taking place.

The apostle Paul spent 14 years in the desert before he began his missionary journeys. Would he not have got in more trips if he started earlier? Perhaps this long was needed for Saul to die, so Paul could live? Transformation takes time. This is why Paul says that Christian leaders should not be recent converts.²⁶

Even when nothing seems to be happening, God is doing his thing. If this is true for butterflies and Paul, why should it not be true for us?

When the world presses in on us with countless things to be done and problems to solve, it can seem very counter-intuitive to pause awhile. There is that checklist. Would I not get more things ticked off if I started right away? But is not slowing down now vital to flying well later? Being still and knowing that God is God does not appear to be the best way to be productive. But in God's economy, being transformed by him will make us into more useful instruments for him.

On the surface, God Incarnate wrapped in burial clothes is very odd indeed. The Holy, Almighty God seems to passively succumb to his evil creatures. Yet, from God's point of view, it was while his body was cold and immobile that his greatest work was done. It is the pupal stage that takes centre-stage in God's plan for humanity in Jesus. Our redemption, our justification, our reconciliation, our life in eternity and much else were all achieved for us while Jesus was in the tomb. God's power, justice and love were all revealed there. As was his wisdom – his strategy. The tomb did not catch God by surprise; it was God's way of catching us. And it worked. How many hundreds of millions of spiritual offspring has Jesus had because of it? God has beauty *and brains*.

Notes

¹ Truman and Riddiford (1999) The Origin of Insect Metamorphosis *Nature* 401:447-452..

² Capinera (2008) Encyclopedia of Entomology. Springer, p. 2458.

³ Cockburn, A. (1991) *An Introduction to Evolutionary Ecology*. Blackwell Scientific Publications, Oxford, p. 168.

⁴ Wilson, E. O. 1988. The current state of biological diversity. In E. O. Wilson (Ed.) *Biodiversity*, National Academy Press, Washington, D.C. pp. 3–18.

⁵ For practical reasons, *Metatopia* is limited in its open-endedness. Many regard determinism as incompatible with free-will, but there are philosophers that dispute this.

⁶ 1 Corinthians 6:10.

⁷ Butterflies can only illustrate shrewd living. Matters of morality must be derived, of course, from other grounds.

⁸ Proverbs 20:29.

⁹ Luke 2:52.

¹⁰ John 2:4.

¹¹ John 6:15.

¹² Luke 4:30. (see also John 7:30)

¹³ John 17:1.

¹⁴ Jeremiah 33:25.

¹⁵ Voth, H. (2000) *Time and work in England 1750-1830*, Oxford University Press, Oxford, p. 244 However, the variance between hunter-gathering societies is high.

¹⁶ Psalm 127:2.

¹⁷ www.robertbrault.com.

¹⁸ 1 Timothy 4:12.

¹⁹ Job 12:12.

²⁰ Proverbs 16:31.

²¹ Job 12:7.

²² Isaiah 53:2..

²³ 1 Corinthians 1:20-24.

²⁴ Clarke, G. (2009) Is it sane to believe in the resurrection?

<https://publicchristianity.org/library/is-it-sane-to-believe-in-the-resurrection>

²⁵ Buszczaka, M. and W.A. Segraves (2000) Insect metamorphosis: Out with the old, in with the new. *Current Biology* 10(22) R830-R833.

²⁶ 1 Timothy 3:6.

News briefs (From the Internet)

How an octopus avoids being seen under headlights

Transparency is a common strategy among denizens of the deep sea. Without the transparency they would be silhouetted and easily spotted by predators below them. Certain fish have countered the strategy by using headlights. The so-called headlight fish train a blue light above them. Now researchers have found that a species of octopus, *Japetella heathi*, has found a way of countering the counter. Normally, they are transparent. If they detect headlights, they immediately become red and opaque rendering them effectively invisible to the headlight fish. They use special cells called chromatophores to effect the trick.

<http://www.sciencedaily.com/releases/2011/11/111110125731.htm>

Biologists extend the fruit fly's lifespan by 50 percent

Biologists know that as we age our mitochondria, the organelles that power our cells, become less active. If the mitochondria could be stimulated perhaps we could live longer. A gene which controls the mitochondria, called PFC-1, was boosted in the fruit fly. Indeed, the fly lived up to 50 percent longer. It turns out that we mammals share the gene and it has the same function. The downside, if they can get humans to live longer, is that we will have to pay medical aid premiums for longer!

<http://www.sciencedaily.com/releases/2011/11/111109093945.htm>

The mob psychology behind a "pro-pedophilia" riot

Jerry Sandusky, assistant football coach at Pennsylvania State, has been charged with 40 counts of sexual abuse of minors over a 15 year period. His boss, Joe Paterno, was fired. Thousands of students rallied in support of their beloved coach, battering cars and up-ending a news van. Why? It is about your social identity explains a psychology professor. "The social groups you belong to become a part of the very essence of who you feel you are." While the behaviour seems morally repugnant, it enabled our ancestors to survive. We have evolved to defend our leaders no matter what.

<http://www.scientificamerican.com/article.cfm?id=penn-state-students-rioted-defied-joe-paterno>

<http://news.yahoo.com/joe-paterno-fired-penn-state-students-riot-protest-082630177.html>

Astronomers see the oldest known galaxy

UDFj-39546284. Remember that. That is the name of the oldest known galaxy. Because it is so far away, astronomers are seeing it as it was 13 billion years ago - a mere 0.75 billion years after the universe began. It is a dim galaxy and would have been hard to find without the 2009 upgrade to the Hubble Space Telescope. While, it is understandable to get excited about what God was doing then, let's not forget to get excited about what he is doing now!

<http://www.scientificamerican.com/article.cfm?id=earliest-galaxy>

Security versus freedom in the cyberworld

If you think malware can be unfailingly identified, think again. Since malicious programs are designed to reproduce and spread, the consequences could be devastating with emergency, financial and other systems crippled. Malware is difficult to identify for many reasons. For instance, the evil may not be found in individual lines of code, but in the way the code is strung together. What to do? Some have suggested that we forego civil liberties and allow the government to scan computer systems. Another possibility is to switch to Linux!

<http://www.scientificamerican.com/article.cfm?id=a-cybersecurity-nightmare>

Beware the self-aware

Some computer engineers are predicting that machines will become conscious and self-aware. How will we know when this watershed moment has arrived? When they make war on us. Logician and philosopher Bringsjord is upbeat. "I would say we could control the future" by responsible uses of artificial intelligence. Hmmm. If we can't control where malware is going, how can we be sure so sure about *awareware*?

Greenemeier, L. (2010) Machine self-awareness Scientific American, June, pp. 28-29

Day-to-day weather is getting more erratic

Until now climate studies have focused on the average weather per month. The problem with this approach is that it will hide day to day fluctuations. Princeton University has conducted the first study on daily weather variation. They found that since the late 1990's the day-to-day climate has become increasingly more erratic and extreme. This could seriously impact ecosystem stability and agriculture and hasten global warming.

<http://esciencenews.com/articles/2011/11/15/erratic.extreme.day.day.weather.puts.climate.change.new.light>

Adolescent sex is bad for one's health

At least for hamsters. Male hamsters at the human equivalent of around 16 years old are paired with females. These males later developed depressive-like behaviour, had lower body mass, smaller gonads and also changes to their brain cells. It is likely that the early sexual activity disrupted proper development of the nervous system.

<http://esciencenews.com/articles/2011/11/15/adolescent.sex.linked.adult.body.mood.troubles.animal.studytem>

Widely used solvent, trichloroethylene, linked to Parkinson's disease

People occupationally exposed to trichloroethylene (TCE) are six times more likely to develop Parkinson's disease than those who are not. This is the finding of a twin study conducted by the Parkinson's Institute. TCE is used in

refrigerators and industrial cleaners. Most of us are exposed to the solvent. It is found in blood, breast milk, water and food. Nearly 25 million kilograms of the contaminant is released into the environment if the United States of America alone. TCE has also causes kidney and liver cancer and lymphoma'

<http://esciencenews.com/articles/2010/02/07/industrial.cleaner.linked.increased.risk.parkinsons.disease>

http://www.latimes.com/news/science/la-me-toxic-risk-20110930,0,526556.story?track=rss&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+latimes%2Fnews%2Fscience+%28L.A.+Times+-+Science%29

A superconducting gem of an idea

Physicists at Tel Aviv University have developed a superconductor based on sapphire crystals that can carry 40 times more electricity than a copper cable of the same size. The finding is significant because it allows for efficient transfer of energy from a renewable energy site (say solar panels in a desert) to a city. Best they start figuring out now how to thwart sapphire cable thieves!

<http://www.physorg.com/news/2011-09-superconductor-fibers-electricity.html>

Humour from the Internet

Social workers

A man has a heart attack and is brought to the hospital ER. The doctor tells him that he will not live unless he has a heart transplant right away. Another doctor runs into the room and says, "you're in luck, two hearts just became available, so you will get to choose which one you want. One belongs to an attorney and the other to a social worker".

The man quickly responds, "the attorney's".

The doctor says, "Wait! Don't you want to know a little about them before you make your decision?"

The man says, "I already know enough. We all know that social workers are bleeding hearts and the attorney's probably never used his. So I'll take the attorney's!"

A man was beaten up by robbers on a road to London. He lay there, half dead and in bad shape. A Vicar came along, saw him and passed by on the other side. Next, a monk came by but also walked quickly on the other side. Finally, a social worker came along, looked at the man and said "Whoever did this needs help!"

How many social workers does it take to change a light bulb?
"The light bulb doesn't need changing; it's the system that needs to change."

Wise as serpents and harmless as doves

Seeing things or seeing the light:

the argument from personal experience Mike L Anderson

Seeing things or seeing the light:

the argument from personal experience Mike L
Anderson

Is it a man, is it a plane no it's a ...

We were teens at a scouting camp on the banks of a dam. In the middle was an island. The boys were telling stories about a very old man on the island that ate children. It seemed to me that as afternoon wore on, the stories became increasingly embellished with the macabre then he ghoulish. I pooh-poohed it all of course.

"Oh, yeah?" was the chorus." If I was so sure, they challenged, I should stay on the island for the night.

"No problem," I asserted. "Pay me and I'll do it." A collection was taken. Soon, a little pile of coins was waiting for my return.

I got my sleeping bag and torch, placed it in a kayak. The shadows were starting to get long as I set off. The excited chatter and laughter of the scouts faded into the background. All I could hear was the soft dipping of the paddle and the lapping of the waves against the kayak. The island was getting closer. In the distance, I could just make out a beach. This is where I would sleep tonight I decided. No need to venture into the surrounding vegetation. To resist my nerves I tucked in my head and pushed on and on.

I looked up to check my bearing and there, standing on the beach in a dark suit, was a man looking intently at me! In the place of his face was ... a skull!! I know what you are thinking. "That is impossible." But I know what I saw. For a moment the kayak continued towards him as I froze in shock. Then I quickly turned the boat. Something made me look back, just in time to see the man take off. The "man" was actually a bird with a pale head. But I was too shaken to complete my adventure, preferring the jibes of the scouts to a night on the island.

The incident illustrates that there is something amiss with the "seeing is believing" argument. If I had returned without seeing the bird, I would not have had a knock-out argument for the paranormal. True, I had a personal experience, but that only leaves me with an anecdote. God alone sees things as they are. For the rest of us, what we see is modulated by our limitations, foibles and circumstances. The bogeyman stories, the twilight, my state of mind and less than perfect vision had all primed me to "see" the worst. "There is more to seeing than meets the eyeball," as philosopher Norwood Hanson famously expressed it.¹ What we see is partly influenced by what the brain expects to see or hopes not to see! So, while superficially, "Seeing is believing" may seem empirically-minded, it is a fallacy.

And researchers have found that personal experience is the most important reason many individuals give for their belief in the paranormal.² It is small wonder, then, that so many Americans (three out of four according to a 2005 Gallup Poll) believe in some form of the paranormal.³

One of my favourite examples of the fallacy comes from Charles Johnson, president of the "Flat Earth Society. He said that his Australian had "sworn out an affidavit that she never hung by her feet in Australia ... We consider that a very important proof that the world is flat." It did not seem to occur to them that they were too small to properly take in the shape of the earth.⁴

Seeing God?

It is easy to spot the fallacy when committed by flat-earthers and believers in ghosts. But what about having visions of God or hearing the voice of Jesus? Does the principle not apply here too? Is atheist Richard Dawkins right when he says that the "argument from personal experience is the one that is most convincing to those who claim to have had one. But it is the least convincing to anyone else, and anyone knowledgeable about psychology. You say you have experienced God directly? Well, some people have experienced a pink elephant, but that probably doesn't impress you. Peter Sutcliffe, the Yorkshire Ripper, distinctly heard the voice of Jesus telling him to kill women, and he was locked up for life. George W. Bush says that God told him to invade Iraq (a pity God didn't vouchsafe him a revelation that there were no weapons of mass destruction)." ⁵

As an aside, Dawkins fails to mention the possibility that the two, well, lied - Peter Sutcliffe to feign insanity, George W. Bush to garner public support for war. A little biblical history would have helped him here. When King David pretended to be mad before King Achish, the latter responded with, "Am I so short of madmen that you have to bring this fellow here to carry on like this in front of me?"⁶

Nevertheless, God has given Dawkins an insight. The argument from personal spiritual experience as an attempt to close discussion is also a fallacy. Is it not especially a fallacy? If I do not see material things as they are, how can I expect to see spiritual things as they are? Does God not forever remain infinitely bigger than my experience of him? Would it not take a God to really see God? I cannot expect to suddenly develop God-like powers of perception in a prayer or revival meeting. He may or may not have met with me, but is it an argument I can foist on others?

What did Jesus see?

The argument from personal spiritual experience might have greater merit if the person so arguing was prophesied about, died and rose again. Yet even Jesus said, "If I testify about myself, my testimony is not valid. There is another who testifies in my favor, and I know that his testimony about me is valid."⁷ Even God incarnate abided by the biblical principle that more than one witness is needed to establish the truth of something.⁸ Even, Jesus recognised his human limitations, and deferred to Another. Jesus's faith was based less on what he saw and more on what the Father said. God has said much. For instance, there is the familiar line in Isaiah, "But he was pierced for our transgressions, he was crushed for our iniquities."⁹ And there is "Therefore my heart is glad and my tongue rejoices; my body also will rest secure, because you will not abandon me to the grave, nor will you let your Holy One see decay."¹⁰

Jesus is the central figure of the Old Testament and the point of a big story that began with God in eternity. The argument from big history is so much greater than the argument from personal experience. If this is true for Jesus, how much more true is it for us? No single human experience could ever capture God, nor even a lifetime of experiences.

It is hard to be cautionary about positive personal spiritual experiences when we are revelling in it. But what happens when the experiences turn sour? Consider Jesus when he felt his Father had abandoned him on the cross.¹¹ If Jesus was looking to positive spiritual experience, would he not be set up to abandon his faith?

What did the Apostle see?

The Apostle Paul had a personal spiritual experience of note - he went up to the third heaven. Yet he was forbidden to blab about it. What he does tell us is the curse that came with it. He was given a thorn in the flesh to keep him from boasting. Perhaps this is why Jesus says to Thomas, "Because you have seen me, you have believed; blessed are those who have not seen and yet have believed."¹² Paul had a personal encounter with the risen Christ, yet chose to mention it last, after the appearing to Peter, the Twelve, the five hundred, James and all the apostles.¹³

The Apostle Peter also had a personal spiritual experience of note - the transfiguration. After mentioning in it his letter, he says, "And we have something more sure, the prophetic word."¹⁴ And he chose not to even mention the transfiguration while seeking to persuade the crowd at Jerusalem. Instead, he appealed to public knowledge and quoted the Old Testament.

"Men of Israel, listen to this: Jesus of Nazareth was a man accredited by God to you by miracles, wonders and signs, which God did among you through him, *as you yourselves know*. This man was handed over to you by God's set purpose and foreknowledge; and you, with the help of wicked men,* put him to death by nailing him to the cross. But God raised him from the dead, freeing him from the agony of death, because it was impossible for death to keep its hold on him. David said about him: "I saw the Lord always before me. Because he is at my right hand, I will not be shaken.""¹⁵ As powerful as the experience of the transfiguration must have been, Peter put it in perspective as a small part of a very big story.

If Jesus, Paul and Peter put personal experiences into perspective, how much more should I do so with my paltry ones whether they are real or imagined, good or bad? They are only part of one story. The danger is that little old me could try to make my story into *the* story. My personal experiences hang on God; he certainly does not hang on my personal experiences.

Seeing the big story

The big story is that God has taken our smallness seriously - that we are too small to take in his shape. And so he became small. In his definitive encounter with humanity, he came shaped as a Nazarene. A lot of people saw Jesus risen from the dead; even more saw him die on the cross and anyone can see that all this was written about in the Old Testament. God said it would happen and it happened. God speaking through Scripture and acting in history is big. The big story is certainly vastly bigger than my personal experience. Here is the place to look to be sure we are seeing the light and not seeing things. God surely wants us to have a personal encounter with him. However, our faith needs to hang on something much bigger than the vicissitudes of personal experience. Oswald Chambers said it well, "My goal is God Himself, not joy nor peace, Nor even blessings, but Himself, my God."

Notes

¹ Hanson, N. R. (1958) *Patterns of Discovery*. Cambridge University Press, p. 7.

² French, C.C. and K. Wilson (2007) Cognitive Factors Underlying Paranormal Beliefs and experiences In "*Tall Tales about the mind and brain: Separating Fact from Fiction*." Edited by Sergio Della Sala, Oxford University, Press, Oxford. p.3.

³ Moore, D.W. (2005) Three in Four Americans Believe in Paranormal
<http://www.gallup.com/poll/16915/Three-Four-Americans-Believe-Paranormal.aspx>

⁴ <http://www.lhup.edu/~dsimanek/flat/flaetart.htm>

⁵ Dawkins, R. (2006) *The God Delusion*. Transworld Publishers, London, p. 88.

⁶ Samuel 21:14.

⁷ John 5:31-32.

⁸ Hebrews 10:28.

⁹ Isaiah 53:5.

¹⁰ Psalm 16-9-10.

¹¹ Matthew 27:46.

¹² John 20:29.

¹³ I Corinthians 15:3.

¹⁴ 2 Peter 1:19 English Standard Version.

¹⁵ Acts 2:22-25, Italics mine.

Feature article

Evolution and Theology

Asa Gray

The attitude of theologians toward doctrines of evolution, from the nebular hypothesis down to "Darwinism," is no less worthy of consideration, and hardly less diverse, than that of naturalists. But the topic, if pursued far, leads to questions too wide and deep for our handling here, except incidentally, in the brief notice which it falls in our way to take of the Rev. George Henslow's recent volume on "The Theory of Evolution of Living Things." This treatise is on the side of evolution, "considered as illustrative of the wisdom and beneficence of the Almighty." It was submitted for and received one of the Actonian prizes recently awarded by the Royal Institution of Great Britain. We gather that the staple of a part of it is worked up anew from some earlier discourses of the author upon "Genesis and Geology," "Science and Scripture not antagonistic," etc.

In coupling with it a chapter of the second volume of Dr. Hodge's "Systematic Theology (Part II, Anthropology)," we call attention to a recent essay, by an able and veteran writer, on the other side of the question. As the two fairly enough represent the extremes of Christian thought upon the subject, it is convenient to review them in connection. Theologians have a short and easy, if not wholly satisfactory, way of refuting scientific doctrines which they object to, by pitting the authority or opinion of one savant against another. Already, amid the currents and eddies of modern opinion, the savants may enjoy the same advantage at the expense of the divines-- we mean, of course, on the scientific arena; for the mutual refutation of conflicting theologians on

their own ground is no novelty. It is not by way of offset, however, that these divergent or contradictory views are here referred to, but only as an illustration of the fact that the divines are by no means all arrayed upon one side of the question in hand. And indeed, in the present transition period, until some one goes much deeper into the heart of the subject, as respects the relations of modern science to the foundations of religious belief, than either of these writers has done, it is as well that the weight of opinion should be distributed, even if only according to prepossessions, rather than that the whole stress should bear upon a single point, and that perhaps the authority of an interpretation of Scripture. A consensus of opinion upon Dr. Hodge's ground, for instance (although better guarded than that of Dr. Dawson), if it were still possible, would--to say the least--probably not at all help to reconcile science and religion. Therefore, it is not to be regretted that the diversities of view among accredited theologians and theological naturalists are about as wide and as equably distributed between the extremes (and we may add that the views themselves are quite as hypothetical) as those which prevail among the various naturalists and natural philosophers of the day.

As a theologian, Mr. Henslow doubtless is not to be compared with the veteran professor at Princeton. On the other hand, he has the advantage of being a naturalist, and the son of a naturalist, as well as a clergyman: consequently he feels the full force of an array of facts in nature, and of the natural inferences from them, which the theological professor, from his Biblical standpoint, and on his implicit assumption that the Old Testament must needs teach true science, can hardly be expected to appreciate. Accordingly, a naturalist would be apt to say of Dr. Hodge's exposition of "theories of the universe" and kindred topics--and in no captious spirit-- that whether right or wrong on particular points, he is not often right or wrong in the way of a man of science. Probably from the lack of familiarity with prevalent ideas and their history, the theologians are apt to suppose that scientific men of the present day are taking up theories of evolution in pure wantonness or mere superfluity of naughtiness; that it would have been quite possible, as well as more proper, to leave all such matters alone. *Quieta non movere* [don't move the settled] is doubtless a wise rule upon such subjects, so long as it is fairly applicable. But the time for its application in respect to questions of the origin and relations of existing species has gone by. To ignore them is to imitate the foolish bird that seeks security by hiding its head in the sand. Moreover, the naturalists did not force these questions upon the world; but the world they study forced them upon the naturalists. How these questions of derivation came naturally and inevitably to be revived, how the cumulative probability that the existing are derived from preexisting forms impressed itself upon the minds of many naturalists and thinkers, Mr. Henslow has briefly explained in the introduction and illustrated in the succeeding chapters of the first part of his book. Science, he declares, has been compelled to take up the hypothesis of the evolution of living things as better explaining all the phenomena. In his opinion, it has become "infinitely more probable that all living and extinct beings have been developed or evolved by

natural laws of generation from preexisting forms, than that they, with all their innumerable races and varieties, should owe their existences severally to Creative fiat." This doctrine, which even Dr. Hodge allows may possibly be held in a theistic sense, and which, as we suppose, is so held or viewed by a great proportion of the naturalists of our day, Mr. Henslow maintains is fully compatible with dogmatic as well as natural theology; that it explains moral anomalies, and accounts for the mixture of good and evil in the world, as well as for the merely relative perfection of things; and, finally, that "the whole scheme which God has framed for man's existence, from the first that was created to all eternity, collapses if the great law of evolution be suppressed." The second part of his book is occupied with a development of this line of argument. By this doctrine of evolution he does not mean the Darwinian hypothesis, although he accepts and includes this, looking upon natural selection as playing an important though not an unlimited part. He would be an evolutionist with Mivart and Owen and Argyll, even if he had not the *vera causa* which Darwin contributed to help him on. And, on rising to man, he takes ground with Wallace, saying:

"I would wish to state distinctly that I do not at present see any evidence for believing in a gradual development of man from the lower animals by ordinary natural laws; that is, without some special interference, or, if it be preferred, some exceptional conditions which have thereby separated him from all other creatures, and placed him decidedly in advance of them all. On the other hand, it would be absurd to regard him as totally severed from them. It is the great degree of difference I would insist upon, bodily, mental, and spiritual, which precludes the idea of his having been evolved by exactly the same processes, and with the same limitations, as, for example, the horse from the palaeotherium."

In illustrating this view, he reproduces Wallace's well-known points, and adds one or two of his own. We need not follow up his lines of argument. The essay, indeed, adds nothing material to the discussion of evolution, although it states one side of the case moderately well, as far as it goes.

Dr. Hodge approaches the subject from the side of systematic theology, and considers it mainly in its bearing upon the origin and original state of man. Under each head he first lays down "the Scriptural doctrine," and then discusses "anti-Scriptural theories," which latter, under the first head, are the heathen doctrine of spontaneous generation, the modern doctrine of spontaneous generation, theories of development, specially that of Darwin, the atheistic character of the theory, etc. Although he admits "that there is a theistic and an atheistic form of the nebular hypothesis as to the origin of the universe, so there may be a theistic interpretation of the Darwinian theory," yet he contends that "the system is thoroughly atheistic," notwithstanding that the author "expressly acknowledges the existence of God." Curiously enough, the atheistic form of evolutionary hypotheses, or what he takes for such, is the only one which Dr. Hodge cares to examine. Even the "Reign of Law" theory,

Owen's "purposive route of development and chance by virtue of inherent tendencies thereto," as well as other expositions of the general doctrine on a theistic basis, are barely mentioned without a word of comment, except, perhaps, a general "protest against the arraying of probabilities against the teachings of Scripture."

Now, all former experience shows that it is neither safe nor wise to pronounce a whole system "thoroughly atheistic" which it is conceded may be held theistically, and which is likely to be largely held, if not to prevail, on scientific grounds. It may be well to remember that, "of the two great minds of the seventeenth century, Newton and Leibnitz, both profoundly religious as well as philosophical, one produced the theory of gravitation, the other objected to that theory that it was subversive of natural religion; also that the nebular hypothesis--a natural consequence of the theory of gravitation and of the subsequent progress of physical and astronomical discovery--has been denounced as atheistical even down to our day." It has now outlived anathema. It is undeniable that Mr. Darwin lays himself open to this kind of attack. The propounder of natural selection might be expected to make the most of the principle, and to overwork the law of parsimony in its behalf. And a system in which exquisite adaptation of means to ends, complicated interdependencies, and orderly sequences, appear as results instead of being introduced as factors, and in which special design is ignored in the particulars, must needs be obnoxious, unless guarded as we suppose Mr. Darwin might have guarded his ground if he had chosen to do so. Our own opinion, after long consideration, is, that Mr. Darwin has no atheistical intent; and that, as respects the test question of design in Nature, his view may be made clear to the theological mind by likening it to that of the "believer in general but not in particular Providence." There is no need to cull passages in support of this interpretation from his various works while the author--the most candid of men--retains through all the editions of the "Origin of Species" the two mottoes from Whewell and Bishop Butler.[VII-2]

The gist of the matter lies in the answer that should be rendered to the questions--1. Do order and useful-working collocation, pervading a system throughout all its parts, prove design? and, 2. Is such evidence negated or invalidated by the probability that these particular collocations belong to lineal series of such in time, and diversified in the course of Nature--grown up, so to say, step by step? We do not use the terms "adaptation, "arrangement of means to ends," and the like, because they beg the question in stating it.

Finally, ought not theologians to consider whether they have not already, in principle, conceded to the geologists and physicists all that they are asked to concede to the evolutionists; whether, indeed, the main natural theological difficulties which attend the doctrine of evolution--serious as they may be--are not virtually contained in the admission that there is a system of Nature with fixed laws. This, at least, we may say, that, under a system in which so much is done "by the establishment of general laws," it is legitimate for any one to

prove, if he can, that any particular thing in the natural world is so done; and it is the proper business of scientific men to push their enquiries in this direction.

It is beside the point for Dr. Hodge to object that, "from the nature of the case, what concerns the origin of things cannot be known except by a supernatural revelation;" that "science has to do with the facts and laws of Nature: here the question concerns the origin of such facts." For the very object of the evolutionists, and of Mr. Darwin in particular, is to remove these subjects from the category of origination, and to bring them under the domain of science by treating them as questions about how things go on, not how they began. Whether the succession of living forms on the earth is or is not among the facts and laws of Nature, is the very matter in controversy.

Moreover, adds Dr. Hodge, it has been conceded that in this matter "proofs, in the proper sense of the word, are not to be had; we are beyond the region of demonstration, and have only probabilities to consider." Wherefore "Christians have a right to protest against the arraying of probabilities against the clear teachings of Scripture." The word is italicized, as if to intimate that probabilities have no claims which a theologian is bound to respect. As to arraying them against Scripture, there is nothing whatever in the essay referred to that justifies the statement. Indeed, no occasion offered; for the writer was discussing evolution in its relations to theism, not to Biblical theology, and probably would not be disposed to intermix arguments so different in kind as those from natural science and those from revelation. To pursue each independently, according to its own method, and then to compare the results, is thought to be the better mode of proceeding. The weighing of probabilities we had regarded as a proper exercise of the mind preparatory to forming an opinion. Probabilities, hypotheses, and even surmises, whatever they may be worth, are just what, as it seems to us, theologians ought not to be foremost in decrying, particularly those who deal with the reconciliation of science with Scripture, Genesis with geology, and the like. As soon as they go beyond the literal statements even of the English text, and enter into the details of the subject, they find ample occasion and display a special aptitude for producing and using them, not always with very satisfactory results. It is not, perhaps, for us to suggest that the theological army in the past has been too much encumbered with impedimenta for effective aggression in the conflict against atheistic tendencies in modern science; and that in resisting attack it has endeavored to hold too much ground, so wasting strength in the obstinate defense of positions which have become unimportant as well as untenable. Some of the arguments, as well as the guns, which well served a former generation, need to be replaced by others of longer range and greater penetration.

If the theologians are slow to discern the signs and exigencies of the times, the religious philosophical naturalists must be looked to. Since the above remarks were written, Prof. Le Conte's "Religion and Science," just issued, has come to

our hands. It is a series of nineteen Sunday lectures on the relation of natural and revealed religion, prepared in the first instance for a Bible-class of young men, his pupils in the University of South Carolina, repeated to similar classes at the University of California, and finally delivered to a larger and general audience. They are printed, the preface states, from a verbatim report, with only verbal alterations and corrections of some redundancies consequent upon extemporaneous delivery. They are not, we find, lectures on science under a religious aspect, but discourses upon Christian theology and its foundations from a scientific layman's point of view, with illustrations from his own lines of study. As the headings show, they cover, or, more correctly speaking, range over, almost the whole field of theological thought, beginning with the personality of Deity as revealed in Nature, the spiritual nature and attributes of Deity, and the incarnation; discussing by the way the general relations of theology to science, man, and his place in Nature; and ending with a discussion of predestination and free-will, and of prayer in relation to invariable law--all in a volume of three hundred and twenty-four duodecimo pages! And yet the author remarks that many important subjects have been omitted because he felt unable to present them in a satisfactory manner from a scientific point of view. We note, indeed, that one or two topics which would naturally come in his way--such, especially, as the relation of evolution to the human race--are somewhat conspicuously absent. That most of the momentous subjects which he takes up are treated discursively, and not exhaustively, is all the better for his readers. What they and we most want to know is, how these serious matters are viewed by an honest, enlightened, and devout scientific man. To solve the mysteries of the universe, as the French lady required a philosopher to explain his new system, "*dans un mot*" [in a word] is beyond rational expectation. All that we have time and need to say of this little book upon great subjects relates to its spirit and to the view it takes of evolution. Its theology is wholly orthodox; its tone devotional, charitable, and hopeful; its confidence in religious truth, as taught both in Nature and revelation, complete; the illustrations often happy, but often too rhetorical; the science, as might be expected from this author, unimpeachable as regards matters of fact, discreet as to matters of opinion. The argument from design in the first lecture brings up the subject of the introduction of species. Of this, considered "as a question of history, there is no witness on the stand except geology."

"The present condition of geological evidence is undoubtedly in favor of some degree of suddenness--is against infinite gradations. The evidence may be meagre . . . but whether meagre or not, it is all the evidence we have. . . . Now, the evidence of geology to-day is that species seem to come in suddenly and in full perfection, remain substantially unchanged during the term of their existence, and pass away in full perfection. Other species take their place apparently by substitution, not by transmutation. But you will ask me, 'Do you, then, reject the doctrine of evolution? Do you accept the creation of

species directly and without secondary agencies and processes?' I answer, No! Science knows nothing of phenomena which do not take place by secondary causes and processes. She does not deny such occurrence, for true Science is not dogmatic, and she knows full well that, tracing up the phenomena from cause to cause, we must somewhere reach the more direct agency of a First Cause. . . . It is evident that, however species were introduced, whether suddenly or gradually, it is the duty of Science ever to strive to understand the means and processes by which species originated. . . . Now, of the various conceivable secondary causes and processes, by some of which we must believe species originated, by far the most probable is certainly that of evolution from other species."

(We might interpose the remark that the witness on the stand, if subjected to cross-examination by a biologist, might be made to give a good deal of testimony in favor of transmutation rather than substitution.) After referring to different ideas as to the cause or mode of evolution, he concludes that it can make no difference, so far as the argument of design in Nature is concerned, whether there be evolution or not, or whether, in the case of evolution, the change be paroxysmal or uniform. We may infer even that he accepts the idea that "physical and chemical forces are changed into vital force, and vice versa." Physicists incline more readily to this than physiologists; and if what is called vital force be a force in the physicists' sense, then it is almost certainly so. But the illustration on page 275 touches this point only seemingly. It really concerns only the storing and the using of physical force in a living organism. If, for want of a special expression, we continue to use the term vital force to designate that intangible something which directs and governs the accumulation and expenditure of physical force in organisms, then there is as yet no proof and little likelihood that this is correlate with physical force.

"A few words upon the first chapter of Genesis and the Mosaic cosmogony, and I am done," says Prof. Le Conte, and so are we:

"It might be expected by many that, after speaking of schemes of reconciliation, I should give mine also. My Christian friends, these schemes of reconciliation become daily more and more distasteful to me. I have used them in times past; but now the deliberate construction of such schemes seems to me almost like trifling with the words of Scripture and the teachings of Nature. They seem to me almost irreverent, and quite foreign to the true, humble, liberal spirit of Christianity; they are so evidently artificial, so evidently mere ingenious human devices. It seems to me that if we will only regard the two books in the philosophical spirit which I have endeavored to describe, and then simply wait and possess our souls in patience, the questions in dispute will soon adjust themselves as other similar questions have already done."

Asa Gray (1810 - 1888) was Fisher Professor of Natural History (Botany) at Harvard University. This except is taken from *Darwiniana: Essays and Reviews Pertaining to Darwinism* (1878) D. Appleton and Co., New York.

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