



Delight in Creation

Scientists Share Their Work with the Church

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5 Biopsychology and the Soul

by William Struthers

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“Psychology has a long past, yet its real history is short,” wrote Herman Ebbinghaus in 1885. As a scientific discipline, psychology has only existed for about 130 years, but the desire to understand and explain why people do what they do has been a part of the human experience from the beginning. Consider the answers that Adam and Eve gave to God in the Garden of Eden. “Why did I eat the apple? Because she gave it to me.” “Why did I eat the apple? Because the serpent tempted me.” Denial, rationalization, justification, redirecting blame—it is all found throughout scripture. The biblical authors pull no punches when it comes to detailing our less-than-flattering dispositions. So what is psychology, then? Is it a flawed human system that leads people away from biblical truth? Is it really the “psycho-babble” that helps people explain away their sin and give them permission to be narcissists? I am sympathetic toward those who believe that psychology produces nothing more than a guild of therapists who want us all to “think happy thoughts,” but in my experience, it is something much different from counselor training. Psychology is a scientific discipline that has as its object an explanation of the human experience.

Psychology is sometimes understood as an attempt to explain human behavior, emotions, or problems (“psychologizing”). Sometimes psychology is understood as a way to emphasize the human individual in an area of study (“a psychological perspective”). Psychology, as most academics understand it, is an academic and applied science that is an important part of our culture and intellectual world. What makes psychology different from common sense or a particular perspective is that it employs the scientific method. Psychology acts as a bridge between the “hard” sciences such as biology and medicine and the “soft” sciences of human life such as sociology, anthropology, and political science. Because of this shared scientific approach and the object of study (human experience), the applications of psychological theories can have an impact in nearly every area of human life. There are many sub-specialties within psychology, just as there are in the ministry of the Church. Biopsychologists, like myself, study human beings (and other species) from a perspective that is distinctively biological. We use as a starting point the reality that human

beings have genes, cells, tissues, and organ systems which together give us a fully integrated human being: an organism. We study the nervous system and, in particular, the brain, the organ that is integral in our thoughts, emotions, personality, and awareness. All of our conscious and unconscious experiences that are anchored in the brain provide a source of wonder for the Christian biopsychologist. My study of it is part of my worship of the Creator. In all of creation, there are few things that I have seen that are more complex, more elegant, more beautiful, or more awe-inspiring than the human brain.

Bio-Psychology?

So how does someone end up becoming a biopsychologist? Do five-year-old children wake up and say, “When I grow up, I want to study gene expression and the Cingulate cortex of rats injected with experimental drugs?” Perhaps some do, but I most certainly did not. In the fall of 1988, I set off to college convinced that I was going to be a psychiatrist. My friends in high school would always bring their problems to me and I seemed to do a pretty good job helping them sort things out. But being a psychiatrist meant that I would need to study the dreaded pre-med courses, including biology. In high school I did rather poorly in my biology classes, so it came as no surprise that I also did rather poorly in college. It took approximately three weeks of freshman biology for me to be weeded out and to realize that biology was not a strength. Studying plants and insects was simply not interesting to me and my exam scores reflected my indifference. I quickly changed my goal from becoming a psychiatrist to becoming a professional psychotherapist. While I would have to give up a future of prescribing medication to help those who had mental illness or psychological problems, I could still look forward to therapy sessions with troubled individuals.

Not far into my psychology college courses, however, I realized that I had selected yet another path that would not play to my unique gifts, talents, abilities, or passions. The coursework was easier, but I soon realized that I was not emotionally cut out to be a therapist. As I continued to

study the many and various ways that human beings could be broken psychologically (and the many ways that they break each other), I found that I was overwhelmed by it all. There was simply too much grief and pain in the world. There was no way that I would be able to speak any words of comfort to someone who had lost a child, was suffering from depression, or was so cognitively scattered that he truly believed he was Napoleon. In the existential crisis that followed, I spent evenings in my dorm room entertaining thoughts of becoming a pastor, a rock star, a standup comedian, a hobo, or an actor. Each one of these potential professions (with the exception of hobo) seemed to have a certain appeal, but they were all missing something that I could not put my finger on. Each lacked a spark—something that I could get truly excited about and envision myself doing for the rest of my life.

During January of my sophomore year, two things happened to me. I started dating the woman who would become my wife and I took a course in behavioral neuroscience. I had fallen in love with my soul mate, and, if there is an intellectual equivalent of falling in love with an area of study, I had found my academic passion: the brain. Long forgotten were the supersquamous epithelial cells and exoskeletons of locusts in my biology class; they were not interesting to me. The brain, however, was captivating. Its simplicity and complexity, its fragility and plasticity were utterly fascinating. I decided that I would spend my academic career studying the brain and investigating the way the mind worked. It was as if scales had dropped from my eyes and I was able to see for the first time. I loved everything about this area from the way that genes turned on and directed neural development to the movement of ions across the cell membranes. I would spend hours marveling at how hormones and brain chemicals (also known as *neurotransmitters*) were involved in depression and the effects of brain trauma which could change a person's personality. My understanding of what makes people tick, why they do what they do, the myriad of ways that neural functioning can be impaired, and what it means to be a human being was transformed from a hodgepodge of theories and intuitions into a systematic, real world, reach-out-and-touch-it framework. Damage to the brain changes the way people think. Low levels of your transmitters

can alter mood. These explanations did not have to rely on the use of a soul or immaterial mind; they were straightforward, intuitive, consistent, and easy to measure. The brain made sense to me as the organ of thought and all of my curiosity seemed to be directed toward this organ. The more I studied it, the more fascinating it became.

After finishing my bachelor's degree, I began my graduate training at the University of Illinois at Chicago where I studied under my doctoral advisor, Dr. David Wirtshafter. Dr. Wirtshafter was a well-known researcher who investigated the neurotransmitter serotonin (the primary neurotransmitter affected by the popular antidepressant Prozac), and I learned what it meant to think as a researcher. He taught me how to ask scientific questions systematically and how to design strategic studies. The bulk of my time over the next several years was spent studying neuroanatomy, pharmacology, and research methodology, while teaching courses at the university. My days were filled with injecting rats, performing brain surgery on rats, slicing brain tissue to put on slides to be looked at under a microscope, performing complex histological stains on these slides, analyzing images of the cells to collect data, lecturing in classes and reading journal articles. It was an exhilarating and exhausting season of life that could begin as early as six in the morning and end well after midnight. Sitting at the microscope, I would take pictures of fluorescing cells that verified neural circuits and analyze slides of neural tissue for protein markers of neural hyperactivity. Even as I write, it is easy to flash back to the thrill that would generate in my spine and rise within me when I collected data. The rush of running a statistical test and finding out that there were significant differences between my samples can be just as exciting as watching my favorite football team (the Pittsburgh Steelers) come from behind and win the Super Bowl. All of the hours spent in dark rooms monitoring rat behavior, delicately slicing tissue, staining, and analyzing microscope images brought a feeling of fulfillment.

The busy life of the graduate student, however, was made even more interesting by my marriage and involvement in church ministry. Somewhere between being a husband, junior high youth leader, and doctoral researcher, there were a number of cognitive boundaries that I drew. Each of my roles

was cordoned off from one another. The research was left at the lab, home was left at home, and church was left at church. This could only last for so long, and toward the end of my doctoral training, I reached a miniature crisis. How could I make what I was learning in the lab fit with my faith? How could I be intellectually honest and study human beings as if they were nothing but the product of genes and tissue functioning? I threw myself at theology texts, including the writings of Augustine and Aquinas, and dove back into scripture. I was trying to make sense of the broken mosaic that I had allowed my mind to become. It was during this period of searching how to integrate my faith and my studies that I was connected with a faculty member at Wheaton College. Through God's divine hand, I began teaching there part time and eventually joined the faculty. My understanding of human beings expanded through the work of colleagues who shepherded me along the way and collaborators at other faith-based schools like Calvin College and Fuller Theological Seminary. It was during this time that my life began to become integrated. Instead of being just another aspect of my life, my faith became an anchor that guided my life in a way that I had never experienced before. So what effect did this have on my studies of the brain? It caused me to look more closely at the scriptures.

“Pleasure Spots” and “Chemical Imbalance”

Some ideas from biopsychology have entered popular culture, but in distorted ways. These common misconceptions are very frustrating to me as a scientist, not just because they oversimplify my field but because they lead to an incorrect understanding of behavior and even morality. I'd like Christians to have a better understanding than the popular culture and not repeat these misconceptions.

One common misconception is that there's a “pleasure spot” in the brain. This statement is a serious oversimplification of how the brain works and can further indoctrinate us into what I will call *biological fatalism*. Biological fatalism is a destructive fad in our time, which has, at its root, the assumption that people are at the mercy of their biology. If a scientist claims to have found a gene for a behavioral problem such as infidelity, an

eating disorder, or hyper-competitiveness, what people tend to hear is, “It's not your fault. Your genes, your brain, and your biology made you do it. You can't help that you like doing X or Y so much. Your brain's pleasure center turns on when you do it, so you can't be held accountable.” This notion that we are at the mercy of our biology denies established psychological research: when you change your way of thinking, you change the way your brain wires itself. Of course there are limitations and such change takes an immense amount of work. Yet some people grasp at biological explanations as excuses for sinful behavior, or feel imprisoned by a false belief that change is impossible. Embracing the truth that we are not determined by our biology can liberate us for healing.

Another misconception is the notion of “chemical imbalance.” Actually, chemicals do a pretty good job of balancing themselves according to the laws that govern them (within certain constraints). A better way to state the issue is that there is a *deficiency* of a chemical in the brain. In other cases, the neurotransmitter is not in short supply, but the receptors aren't working properly (by way of analogy, simply adding more gas doesn't make a car drivable if it doesn't have tires on the wheels). The body is so much more than just a pot of chemicals that can be easily fixed by adding more chemicals. If you've ever been close to someone who struggles with depression, then you know that taking antidepressants is not like adding salt or pepper to a soup to make it tastier. Human beings are not just chemical equations to be balanced. Diet, exercise, psychological stress, trauma, hormones, social interaction patterns, personality, the death of a loved one—all of these factors can impact a person's emotional state. They must all be addressed in the treatment of someone who is struggling with a mental health problem.

Biopsychology and the Bible

As a man of faith, my understanding of who I am is rooted in my understanding of scripture. This understanding is complemented by my understanding of my biology, particularly my understanding of the human brain. The question of what it means to be human is answered more

completely when I listen to both the witness of scripture and the science of psychology, which intersect in several key areas.

The Soul and Embodiment

What does it mean to be human? Many, especially in the Western world, will assert that people are immaterial, spiritual souls that are trapped in bodies. Does belief in science, which explores the realm of the body, mean that we must lose our belief in the soul? The fear in many Christian circles is that we'll reduce ourselves to nothing more than a physical substance. If there is no distinct substance that exists after death, then there is nothing else—no heaven or hell, no free will or sin. If humans are reduced to material machines, even though they are very complex and highly evolved things, we lose any special place within creation.

However, Christians around the world confess the resurrection of a body and not the immortality of the soul. It was my understanding of the nervous system and my exploration of scripture that directed me to discover that I don't *have* a soul; rather, I *am* a soul, an embodied creation who bears the image of God. If there is one thing that biopsychologists bring to the table which forces Christians to reevaluate who human beings are and what they are for, it is the concept of *embodiment*. The principle of embodiment holds that we exist in a certain place and time, and our physical bodies are necessary for our existence. Neurobiologists will draw attention to studies showing that all of the theological, philosophical, and psychological perspectives about human nature and uniqueness can be explained as a function of our brain activity.

Human Uniqueness

While scripture tells us that humans are unique and distinct by definition (as are all species, by the way), we are driven to look for biological confirmation of our uniqueness compared to animals: humans are the smartest, humans use tools, humans use language, and so on. Unfortunately, whenever a cognitive or behavioral goalpost is erected as the definitive standard, our non-human animal friends find a way to kick the field goal—and we feel

the need to move the goal posts back another ten yards to soothe our wounded species-ego. For example, we found that chimps use tools and that gorillas can learn sign language. The most recent addition to the game is the standard of culture. This set of information, or *memes*, which passed from generation to generation, from societal member to societal member, provides a sort of information-processing survival of the fittest. These memes procreate by being communicated via language and birthed in the mind of the recipient. We set up the capacity for abstract thought, highly complex language, and the coherent internal representation of the external world that is created as the standard that makes humanity unique. It is from here that we are tempted to construct meaning and purpose.

The field known as theological anthropology is concerned with the study of humankind in relation to the divine and humanity's unique place in the universe. Within the Christian story, it is clear that humankind is set apart and the question is whether it is a matter of degree or of kind. Are we just a bit further along with respect to a cognitive capacity—a little ahead of the curve, so to speak, when compared to the rest of creation? Or are we something that is fundamentally different to the core—not just quantitatively different, but qualitatively different?

Interestingly, in all of creation, humans alone seem to have a sense of incomplete fulfillment, as if we are aware of an environment that exists beyond what our senses are capable of tapping into. We have intellectual, cognitive, religious, and spiritual capacities that generate a host of needs, desires, passions, and ambitions that cannot be pacified this side of the Jordan. We have the potential to suffer beyond that of other species (including our nearest primate cousins). We have a capacity for happiness which exceeds the rest of creation. Philosophers and theologians from all cultures across the millennia have expressed these longings. Our quest for self-actualization, self-discovery, and spiritual awareness has occupied a substantial portion of cultural resources. As a result, we need to consider that we have not really identified what our true environment is. Where is true human flourishing found? It is in humanity that creation has become aware of itself—its past, its future, and its maker.

While our cognitive tools—self-awareness, language, complex abstract thought, and the ability to create a coherent understanding of the world—

are seen in non-human animals, it is the human brain that seems to be uniquely equipped for relating to the Creator. Our environment is internally represented as a set of information that interacts with our sense of self. Our brains define what is us, and what is not us, what is really out there, and how things work. The brain works to take this knowledge and find patterns; that is to say, it looks for order and meaning. It is here we begin building a model of human experience which traffics in information processing and enables consciousness.

Image of God

From the very first chapter of Genesis, we begin to see what makes humanity unique in creation: human beings are made in the image of God. The image of God is not a soul-ish substance, cognitive property, behavioral function, or capacity. To treat it as something to be identified or located is to miss the point. Theologian Philip Hefner writes in *The Human Person in Science and Theology*, “For Christians the image of God is instantiated normatively in Jesus. Although this assertion has had a long and rich tradition of interpretation, there is no consensus on exactly what it means; there is no single official or even standard interpretation of the concept of the image of God.” Being made in the image of God is one of the foundational theological starting points for those in the Christian faith when examining humanity’s place in the universe. It is because of our “image-of-God-ness” that we believe that each human life is sacred. We act as God’s agents and representatives in this world. Because of this image, we are interconnected, relating with one another and with the Creator.

But scripture and the witness of the Church tell us that the image of God is also a person: Jesus Christ. In his letter to the Colossians, Paul writes, “[Jesus] is the image of the invisible God, the firstborn over all creation” (1:15). And to the Corinthians, he writes, “The god of this age has blinded the minds of unbelievers, so that they cannot see the light of the gospel that displays the glory of Christ, who is the image of God” (2 Cor. 4:4). So how are we made? To be made in the image of God is to be embodied and embedded in the story of creation. Paul also speaks to this in Romans: “For those whom he foreknew he also predestined to be

conformed to the image of his Son, that he might be the firstborn among many brothers and sisters” (8:29). We are to be conformed to the image of Christ.

Sanctification

Scripture is echoed by the data of biopsychology, which addresses not only that we are human *beings*, we are also human *becomings*. The development of the nervous system from the embryo to childhood to old age offers a glimpse of this process. Our experiences and our responses sculpt our brains and make some behaviors and thoughts more or less likely to happen. As we make decisions that are in line with scripture, we lay down neural circuits that make sin less of an option. What we speak of as freedom in Christ is reinforced by the function of our brain circuitry. It is not freedom to do as we want, but freedom from sin. In the same way, a life of sin and depravity has long-lasting neurological consequences that make a virtuous life less of an option. Addiction to a vice and passion for holiness are two sides of the same neurological coin. I find this understanding of who we are both powerful and exciting. Imagine that the process of our sanctification is part of the neurological blueprint that is laid down in each of us. Our nervous system includes a brain wired to think in such a way that some temptations can cease to be tempting. In this context, the process of maturing in Christ is not a loss of personal freedom, but freedom from the power of sin.

Science can offer a vision of what we can become, but it offers no clear goal. Given that we are unified things, we can then be transformed—sometimes passively, sometimes actively, but always into something different than what we are now. Human life is not a static adventure. It is an ongoing, dynamic process in which we begin as a fertilized egg. Then, we develop *in utero* and are delivered to be nourished, cared for, and challenged. We develop linguistic abilities and abstract symbolic systems. We adopt cognitive sets and meet the challenges of our environments as we become socially embedded in our culture. We ask similar, yet unique questions necessary for survival, making sense of the world as we are constantly changing and adapting, becoming something that we have not been.

Purpose

Our purpose is to be conformed to the image of Christ in the manner in which we live, breath, think, act, worship, and glorify God, and this involves our bodies. My studies of the nervous system may enable me to understand the architecture of human nature, but I need my theology to direct my understanding of our embodied nature. What I find so interesting about scripture is that it does not focus as much on the “stuff” of which we are made (philosophers would call this our *ontological nature*), as it does on what we are made for (our *teleological nature*).

But what is it that we are becoming? My neuro-scientific training doesn't look into the future toward any specific goal; it can only look backwards and into the present. Any claims that it has about purpose are limited to descriptions of function. However, scripture teaches that what we become is just as important as being. We are to live our lives so that we may be sanctified, uniquely conformed to the image of Christ.

Further Reading

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