Neuroscience, Psychology, *and* Religion

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Neuroscience, Psychology, *and* Religion

ILLUSIONS, DELUSIONS, AND REALITIES ABOUT HUMAN NATURE

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Contents

Preface

At times, science develops very fast. Neuroscience and psychology are in one of those periods, with research at the interface of these fields moving at a breathless pace. We have progressed from the "Decade of the Brain" in the 1990s, to the "Decade of the Mind" at the beginning of the twenty-first century. It seems as though we are now looking forward to the "Decade of the Mind/Brain." All this development has been fueled by new research technologies, notably developments in brain-imaging techniques. The result: no area of our existence seems safe from the probing eyes of the brain scanners. Even our religious experiences have come within the scrutiny of "neurotheologists." The research findings seem so critical to the understanding of our selves as human beings that they are frequently given wide publicity outside of the academy.

What are we to make of it all? How much of our understanding of human nature are we being called upon to rethink? Do we have a soul? Are we apes on the way up or angels on the way down? Is the human mind, including religion and religious experiences, to be reduced to nothing other than the outcome of the rules governing the functioning of neurons and their molecular structures?

This book attempts to help you, the reader, gain understanding and perspective on what is currently happening in research in neuroscience and psychology. Throughout these chapters, you will encounter thought-provoking material, such as descriptions of brain systems and processes involved in the most sophisticated aspects of mental life and comparisons of the neuropsychology

of humans and nonhuman primates. You will also find accounts of studies of brain function and religious beliefs and experiences. In all of these areas of research, we have attempted to provide you with relevant contexts and perspectives—historical, philosophical, and theological—for rethinking your concepts of human nature.

Neuropsychology is a specialist scientific field that works at the junction between neuroscience and psychology. We are both neuropsychologists. We also share a common research interest in parts of the brain that connect the two cerebral hemispheres, primarily the corpus callosum. One of us, Warren Brown, continues actively researching in this area (at the Fuller Graduate School of Psychology in California), working with collaborators at California Institute of Technology, University of California San Francisco, and Brigham Young University. The other, Malcolm Jeeves, though supposedly retired, continues to interact with scientists and laboratories with international reputations in both neuroscience and evolutionary psychology (at the University of St. Andrews in Scotland).

As well as enthusiastic scientists, we are also both active Christians, sharing the challenges that scientific discoveries pose for some traditional Christian beliefs. In what follows, we invite you to look at our responses to some of these challenges, see where we have got to in our thinking, and decide what you make of it all.

At the end, we give an extensive index and a list of further reading for those who may wish to follow up in greater depth some of the ideas raised by what we have written. We hope you enjoy reading it as much as we have writing it.

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CHAPTER 1

Neuroscience and Psychology Today

The issues of neuroscience arise every day in our modern world. We hear about the sad effects of Alzheimer's disease on the elderly but also those stories of patients waking from comas, regaining their ability to speak—as if nothing had happened. Soldiers return from the battlefield suffering from brain damage they received in combat. Our Western literature also gives occasional glimpses of what happens when the workings of the brain go wrong, and perhaps none is more memorable than the account given by the Russian writer Fyodor Dostoyevsky in his novel *The Idiot*. In this story, the character Prince Myshkin has bouts of epilepsy. During a brief "pause" before a seizure begins, he notices that

> his brain was on fire, and in an extraordinary surge all his vital forces would be intensified. The sense of life, the consciousness of self, were multiplied tenfold in these moments. . . . His mind and heart were flooded with extraordinary light; all torment, all doubt, all anxieties were relieved at once, resolved in a kind of lofty calm, full of serene, harmonious joy and hope, full of understanding and the knowledge of the ultimate cause of things. . . . If in that second—that is, in the last lucid moment before the fit—he had time to say to himself clearly and consciously: "Yes, one might give one's whole life for this moment!" then that moment by itself would certainly be worth the whole of life.[1]

Although this is literary fiction, the description accords well with the extensive literature showing how unusual religious experiences are sometimes associated with temporal lobe seizures. Dostoyevsky himself had epilepsy, and this passage may well describe his own seizure experiences.

This book introduces readers to the wide range of issues in modern neuroscience and psychology, but it will take a particular interest in the topic raised by Dostoyevsky's compelling account: the role of brain activity in human behavior, experience, and even religious belief. Given the clear relationship between brain activity (abnormal activity, in this case) and its manifestations in psychological and religious subjective experiences, how should we view human experiences? Are human behavior and experience nothing more than the outcome of the physiological functioning of neurons or of the laws of physical chemistry governing the molecules that make up neurons? This consideration finally leads us to the specific question of how human nature can be interpreted from the perspectives of science, religious worldviews, and our inner subjective experiences.

In the past few decades, developments at the interface of psychology and neuroscience have seen remarkable advances. Psychology has also been hitting the headlines where it interfaces with evolutionary biology, generating the new specialty of evolutionary psychology. As the headlines also attest, some scientists have interpreted this progress as a confirmation of atheism—that is, if important properties of human nature, such as religiousness, can be shown to be aspects of the natural world, then any religious view must be ruled out. Both the popular science writer Richard Dawkins and Nobel laureate Francis Crick have published widely read books arguing this point. Crick spelled out what he saw as some of the radical implications of developments in neuroscience in his book *The Astonishing Hypothesis* (1994).

This debate is not new, of course. Throughout the history and development of psychology and neuroscience, leading figures

have written about the implications of this research for traditional religious beliefs. Some have written as theists and others as atheists. Leading figures in psychology who were theists include William James, Carl Jung, Gordon Allport, and Sir Frederic Bartlett. Among the atheists are Sigmund Freud and B. F. Skinner. In neuroscience, a leading theist was Sir John Eccles and a leading atheist Francis Crick, both Nobel laureates. When we see such distinguished scientists in psychology and neuroscience taking these radically different views on religion, the lesson becomes clear: there are no easy answers to these questions. There are no knockdown arguments to settle the debates. In these pages, we will explore the dialogue between a religious worldview and the rapidly accumulating new results from human neuroscience and psychology.

Neuroscience

For the past half century, the field of neuroscience has experienced remarkable growth, from an undesignated scattering of research enterprises to one of the largest, fastest-growing, and most rapidly advancing fields of science. The commitment of both the scientific community and governments to research in neuroscience was underlined in the minds of the public when the U.S. Congress declared the last ten years of the twentieth century "The Decade of the Brain." The consequence of this was a significant increase in research funding for neuroscience. This rapid growth is also reflected in the increase in the number of active researchers in neuroscience over the past thirty years. At the inaugural meeting of the Society for Neuroscience in 1969, there were a hundred participants. In 2005, there were more than thirty thousand. In the same year, leaders of nine nations within the European Community became sufficiently concerned about the wider implications of research in psychology and neuroscience that they set up a commission to report on these.[2]

New technologies have fueled this rapid growth of research. The most important advance is a new means of imaging the human brain in a nonintrusive manner—that is, in a manner akin to taking a simple x-ray. Magnetic resonance imaging (MRI) allows scientists to look at the structure and integrity of brain tissue inside the skull of a patient or research participant. Then, using *functional* MRI (fMRI), it is possible to superimpose on the MRI's brain image an additional representation of areas that are relatively more metabolically active. By this, patterns of brain activity can be observed during a particular mental state or while accomplishing a cognitive task. For example, brain activity can be seen in the language areas of the left cerebral cortex when a person is asked to provide verbs to accompany nouns. Another research tool, positron emission tomography (PET), is very much like fMRI in providing information about the distribution of mental activity in the brain. These are the most often used of an increasingly large array of brain-imaging techniques that are still being developed.

New technologies are also allowing scientists to refine older methods of studying the brain in living subjects. Prior to the advent of brain imaging, neuroscience had focused on experimental studies of animals or relied on the clinical observations and behaviors of people with brain damage or brain disease. Now there is a way to experiment harmlessly with such interruptions to the brain. This is possible with transcranial magnetic stimulation, a technology that gives scientists a reversible method of temporarily disrupting brain activity in selective areas. Thus, research on the effects of the disruption of function is no longer limited to experimentally damaging (or stimulating) brain areas in animals or to studying accidental damage in humans.

With the tools of imaging, neuroscience has also begun to tackle the highest forms of human cognitive and social functioning. For example, researchers have imaged brain activity while a person is involved in moral reasoning or while experiencing empathy for another human being—a topic we will review in later chapters.