

[[The following is a collection of notes and handouts from two or three different lectures given in 2000, some repetition, not organized into publishable form.]]

The Brain, Biology, Behavior, and Sin

Introduction:

We are increasingly learning how brain damage and chemical imbalances can profoundly influence personality and behavior. In some individuals, "sinful" thoughts and behavior patterns can be changed positively by prescription drugs. These discoveries lead some to a radical reductionist conclusion: that behavior is nothing but the computed outcome of a neural network, "sin" is a meaningless and outdated notion, consciousness is merely an epiphenomenon, and the "soul" doesn't exist. Science is a God-given gift for learning about creation and ourselves, but the answers it gives can sometimes shake up our beliefs. Does the reductionist view necessarily follow from the science? Much of Christian theology about sin and the soul is couched in the concepts of classical dualism. What are the essential, revealed truths about sin and the soul? How can they be maintained, perhaps even illuminated, by the results of modern neuroscience? How can the church take a leading role (rather than merely a reactionary role) in putting these scientific discoveries into a larger perspective?

Some Biblical principles regarding behavior:

- We are to examine our own behavior, confess our sins, and repent of them.
- We are to encourage the spiritually weak who are struggling with temptation.
- We are to minister to the sick, and try to heal them if possible.
- We are to value the variety of non-sinful differences in other people, since these may reflect God's special gifts to them and to the church.

How society typically classifies behavior:

Free choice: The behavior was freely chosen by the individual.

Implication: Hold people responsible for bad behavior, punish them.

Illness: The behavior was caused by a medical condition.

Implication: Treat them with drugs, therapy, and other medical interventions.

Natural: The behavior falls within the variability of how normal, healthy people behave.

Implication: As long as they're not hurting anyone else, leave them alone.

Biological factors which influence behavioral choice:

- Neurodegenerative disease or brain injury. (e.g. brain tumor, Alzheimer's disease, Tourette's syndrome.) Can alter behavior and in some cases personality. Changes can occur slowly or suddenly.
- Psychological trauma. (e.g. being abused as a child.) Can have long-lasting affects in the brain which play a role in later behavior.
- Genetic predispositions. (e.g. some forms of alcoholism, some forms of obesity.) Particular genes affect brain functioning to predispose people towards certain behaviors.

- Evolutionary psychology. (e.g. hypothesis linking social status, serotonin levels, and use of violence.) Attempts to understand human behavior patterns as strategies for survival and reproductive success in a complex social hierarchy.
- Brain biochemistry. (e.g. some forms of clinical depression.) Behavior and personality can be profoundly influenced by neurotransmitter levels and by drugs which alter those levels.

Our behavior, attitude, and personality are very much subject to our conscious, deliberate choices in our everyday lives. But we are learning that our behavior, attitude, and personality are also subject to biological factors beyond our conscious control.

Claim: If we identify biological factors influencing a behavior ==> then we shouldn't hold people responsible for it.

Version 1: Human behavior is completely deterministic. This claim is a gross extrapolation of current data and ignores the data of the meaningful choices we experience in our everyday lives.

Version 2: Compartmentalizing behavior. It is too simplistic to categorize behavior as freely chosen or determined by biological factors. Whatever our biological condition (except in the most extreme cases), we can make deliberate choices to either succumb to, or to overcome, behaviors to which we might have a predisposition. (e.g. overcoming alcoholism through deliberate choices.) Biological factors may make this easier or more difficult.

Holistic view of behavior: Our physical, neurological, psychological, emotional, and spiritual aspects form a unified whole which influence each other in ways we are only beginning to learn about scientifically. For some individuals, the first important step to healing an emotional and spiritual crisis will be a medical treatment (taking a drug, or simply getting the right food, exercise, and rest). For other individuals, such medical treatments would only mask problems which must be addressed, first of all, through counseling, prayer, repentance, and spiritual disciplines. The right strategy of medical, psychological, social, and spiritual approaches must be tailored to each individual's situation, using our best judgment about which to emphasize, and in which order.

"Taking" responsibility: We acknowledge that factors beyond our control were, to a greater or lesser extent, responsible for our current unpleasant situation -- whether that is drug addiction, depression, a quick temper, or a hateful or prideful attitude. Now that we are aware of those factors, we can do something about them. This knowledge increases our responsibility for our behavior, rather than decreasing responsibility.

Brain biochemistry and everyday life: Activities like eating too much junk food, drinking caffeine, or simply getting sufficient food, rest, and exercise can influence our behavior, our attitudes, our temper, our patience, and how well we concentrate during spiritual disciplines. "Physical" activities like eating and exercising have spiritual consequences.

What about "sin"? Christian theology refers to "sin" both as specific choices/actions and as our entire sinful condition ("original sin"). The Son of God came to earth to overcome both of these problems and so restore us to God. Sin does not consist only of nasty behavior towards others. Sin is turning away from God.

“Cosmetic psychopharmacology”

Brain researchers are continually making new discoveries about brain structures and brain biochemistries which mediate and influence our behavior choices. The increasing use over the last decade of psychopharmaceutical drugs such as Ritalin and anti-depressants is probably just the beginning. As brain researchers add to our knowledge, new medical treatments will become available which can alter moods and behaviors. Already the availability of such treatments is affecting how society thinks about and treats aberrant behavior. The field of evolutionary psychology, when coupled with knowledge gained from brain research, has the potential to give us further insights into the ways in which our biological nature affects our behavior choices. Again, these insights into our biology will affect how we think about behavior and choices.

As we learn more about the ways in which our biology affects our behavior, this knowledge raises a host of medical, psychological, sociological, philosophical, and theological questions. To what extent is our behavior determined by biological factors, and to what extent is our behavior under the control of our "free will"? Is that question even well-posed, or do we need to refine our understanding of "free will"? Under what circumstances should the medical profession, or society as a whole, encourage or compel people to take behavior-modifying drugs? What should the church advise its members? When we discover new ways in which biological factors influence our behavior, does that knowledge reduce our responsibility for our behavior? Or can we argue that these discoveries actually increase our responsibility for our behavior? What about the theological concepts of "sin" and "sanctification," which are intimately concerned with human behavior? Are those theological concepts endangered by what we are learning about behavior and biology, or can they actually be refined and reinforced by what we are learning? These questions must be addressed by Christian scholars from a variety of disciplines.

Brain Biochemistry, Behavior, and Sin

NOTHING BUT-TERY

overhead cartoon of Calvin&Hobbes, "What is love?"

Claim -- "Noble sentiments" such as love, altruism, etc. are nothing but biological drives to preserve the species.

--This is nothing but-tery. Yes, there may be a biological basis for these sentiments, but that doesn't mean that is ALL they are.

--As Christians, we have no problem with these "noble sentiments" having, at least in part, a biological basis.

--In fact, as Christians we would EXPECT them to have some biological basis. God made us in his image; God made us capable of love and altruism; it is part of our created nature.

--But this raises another issue. If our biology affects our behavior, both for good and for bad, what are the implications?

CLASSIFYING BEHAVIOR AND "RESPONSIBILITY"

--[[overhead of "science --> not responsible for behavior"]]

--Some people would say that the implication is that we shouldn't hold people "responsible" for their behavior. If we can identify neurological and genetic factors which influence behavior, this PROVES that people should not be held responsible for their behavior -- they should be treated medically or simply left alone.

--[[overhead of 3 categories]]

Responsibility for behavior is an age-old question. How do we, as a society and as individuals, classify "aberrant behavior"? Typically, we try to classify aberrant behavior in one of these three ways: (1) We might say that someone's behavior was a free choice, hold them responsible for that choice, and punish them for doing something "wrong." (2) We might say the aberrant behavior was caused by a medical condition. (3) We might simply call it "natural" for some people to behave in certain ways and not do nothing else to them.

How do we choose? The answer to that question often depends upon context. Consider the example of **reckless driving**. If someone drives past the speed limit, weaving in and out of traffic during rush hour, we hold her responsible. If someone with Alzheimer's disease manages to get the family car when no one is watching and then drives recklessly, we blame it on the disease. If someone builds hotrod cars and competes on race tracks because he gets a thrill from the challenge and the speed, we may think he's a little "nuts," but we just consider it "natural" for him to be that way and leave him alone.

But people don't always agree about how to classify behavior. Consider the example of heroin usage. Most people would punish heroin usage as a crime. Some people insist that addictions such as heroin usage should be treated as a medical condition. A few people of a libertarian bent say that as long as heroin users aren't committing other crimes, we should just let them be.

People have been debating how to classify behavior since long before modern science. Today, people are using the results of science to back up their arguments. **The problem, it seems to me, is that people are still trying to compartmentalize each behavior into one of these three categories.** But scientific studies of behavior usually don't give such clear-cut, compartmentalized answers. Neuroscience seems to be telling us that those few categories we use --- fully responsible or fully non-responsible, natural or illness --- are too simplistic.

**** BIBLICAL PRINCIPLES**

Before going on with this, we should keep in mind some biblical principles about behavior. I would briefly summarize those biblical principles this way:

[[overhead of biblical principles about behavior]]

- 1) We are to examine our own behavior, confess our sins, and repent of them.
- 2) We are to encourage the spiritually weak who are struggling with temptation.
- 3) We are to minister to the sick, and try to heal them if possible.
- 4) We are to value the variety of non-sinful differences in other people, since those non-sinful differences in their personalities may reflect God's special gifts to them and to the church.

You see that these biblical principles parallel, to some extent, the categories of behavior society uses; but there are differences. Whereas society judges and punishes people who willfully do wrong, as individual Christians our job is usually to humbly encourage them to overcome temptation. Whereas society may overlook some "natural" behaviors as long as they don't hurt anyone else, as Christians we say that just because something is "natural" doesn't mean it isn't sinful. We might still need to help that person to change his or her ways.

In order to respond appropriately to aberrant behavior, it is necessary --- as Christians and as members of society --- to evaluate behavior and try to determine just how "responsible" people are for their actions. With that in mind, let's look at how science is both helping us do that, and making it more difficult.

[[overhead of 5 physical influences on brain/behavior]]

**** Neurodegenerative DISEASES AND BRAIN INJURY**

There are medical case histories where a brain injury, tumor, or neurodegenerative disease like Alzheimer's caused profound changes in a person's personality --- changes often for the worse. Or consider Tourette's syndrome: a fairly rare disease which doesn't so much affect personality, but does affect behavior. Tourette's syndrome is thought to affect parts of the brain responsible for inhibition of actions. Many sufferers describe an "overwhelming compulsion" to perform certain body movements or facial ticks. For an unfortunate few, the compulsion is to say swear words or racial epithets which they absolutely don't want to say, but the very forbiddenness of the words feeds the compulsion. Now, if a normally nice, thoughtful, sweet-tempered person says hateful things when suffering severe Alzheimer's or Tourette's, we can easily forgive them and attribute that behavior to the disease. But of course, there are mild cases of these diseases as well as severe. Alzheimer's is a progressive disease, and these diseases strike both sweet-tempered and ill-tempered people. What these cases illustrate is that there is not always a sharp demarcation between "responsible" and "non-responsible" behavior. When a progressive neurodegenerative disease causes slow changes in personality and behavior, the line between "responsible" and "non-responsible" blurs.

**** PSYCHOLOGICAL TRAUMA**

Trauma to the brain need not be physical or pathological. It can be psychological.

--*[[overhead of C&H "become a psychopath"]]*

--*[[overhead of C&H "gifted child"]]*

--This is what Calvin is complaining about. His childhood experiences will make him a bad person.

But more seriously, consider the strong correlation between people who are child abusers and those who were abused as a child. The psychological trauma of being abused as a child can have long-lasting effects on the brain which play a role in later behavior. Is this a completely causal relationship? Does it determine the behavior? No. Yet the case can be made -- and is sometimes made -- that because of their history, some child abusers are less "responsible" for their actions than others.

**** GENETIC PREDISPOSITIONS**

Advances in genetics are also changing the way we think about behavior. About four years ago in the journal *Nature*, there was an article about a mouse gene with dramatic effects on behavior. The cover photos were striking. They showed two adult female mice with newborn litters. In the first picture, the pups were snuggled up to and nursing from the mother. In the second picture, the mother --- who simply had one gene different from the first mother mouse --- was completely ignoring her pups, which were scattered about the cage unattended. Scientists tried to resist calling this gene the "nurture gene," because of course nurturing is a complex behavior controlled by many genes. It was not immediately known what this one gene specifically does, whether it controls some aspect of nerve growth in the brain, or odor sensitivity, or what. Still, it was a remarkable demonstration of how much affect a single gene can have on behavior in animals as complex as mice.

Genetics is affecting our view of human behavior.

--[[*overhead of C&H "poor genetic material"*]]
--Calvin tries to blame his behavior on his genes.

But our study of genetics isn't so much pointing to CAUSES of human behaviors, but rather as predispositions. There are well-established genetic markers linked to a predisposition for alcoholism. A few years ago, another study claimed to find a link between certain genes and a predisposition for risk-taking behavior, although that study was later strongly challenged. Or consider the example of obesity. Obesity was long associated with gluttony -- one of seven deadly sins. However, there is a certain amount of natural variation in people's metabolisms. Now scientists are finding genes which control metabolism and drugs which can compensate for defective genes. So for any particular case of obesity, it may not be possible to classify it simply as a result of indulgent choices OR a medical condition OR just the natural variation amongst people.

**** EVOLUTIONARY PSYCHOLOGY**

While the field of genetics might suggest that different people behave differently because they have a few different genes, the field of evolutionary psychology largely ignores those few differences and concentrates on the genetic similarities amongst all people. It tries to understand how we, as a species, behave.

--[[*overhead of C&H "bird mating dance"*]]

But of course, we are more complex than birds. And when evolutionary psychology is done right, it tries to take that complexity into account. Evolutionary psychology tries to understand human behavior patterns as strategies for survival and reproductive success in a complex social hierarchy.

--[[*overhead of C&H "what is love?"*]]

--These cartoons gives a very simple and fairly useless example of an evolutionary psychology story. But there are some more detailed and potentially useful hypotheses.

For example, the reasoning might go, an individual at the top of a social hierarchy could best keep his high position by using violence in a minimal, controlled fashion. By contrast, for an individual at the bottom of the hierarchy with nothing to lose and seeking advancement, the best strategy is to take risks in using violence. This behavior is exactly what is seen in most social groups of primates; moreover, social status and violent risk-taking are correlated with levels of the neurotransmitter serotonin in the primate brain, which suggests an actual mechanism for translating social cues into behavior choices.

I should add that a great deal of what you'll hear in the popular media under the name of "evolutionary psychology" is pop psychology in a new wrapper. A lot of speculative stories are spun without empirical data to back them up. You can spot these speculative stories whenever people try to link genetics DIRECTLY to behavior, without trying to hypothesize what brain structures or circuitry might be involved in transducing genetic factors into behaviors. It's too early to embrace such stories as truth, but it's also too early to dismiss them entirely. Some real work is being done, by some scientists, to try to link these hypotheses from genetics to brain function to behavior and back again to genetics. If there is some truth to the hypotheses generated by evolutionary psychology, they may provide some additional insights into the next topic: brain biochemistry.

**** BRAIN BIOCHEMISTRY**

By now I suppose you've all heard about the drug Prozac. It is used to treat depression and obsessive-compulsive disorder. For some people, taking the drug can help change attitudes and behavior patterns which we would call aberrant or even "sinful." It can also alter some "neutral" behavior patterns, such as how introverted or extroverted they are.

So altering levels of certain neurotransmitters in the brain can cause some changes in personality and behavior. In most cases, anti-depressants like Prozac are used to correct a physical imbalance in someone's brain chemistry. The drug is simply making these people well, and some patients who take Prozac say they feel "more like themselves" while taking the drug than during the years they lived without the drug. However, we should remember that there is a spectrum of "proper" neurotransmitter levels in each individual. Inevitably, therefore, there are "borderline cases." For someone on the "borderline," how do we answer the questions: are they clinically depressed, or just depressed? Are their neurotransmitter levels too low, or just low? We cannot answer those questions simply on the basis of whether or not they respond to the drug, because some people who would otherwise be diagnosed as perfectly healthy do respond, biochemically and behaviorally, to taking anti-depressants like Prozac.

In our everyday lives, our behavior, our attitude, and our personality are very much subject to our will, subject to our deliberate choices. At the same time, neuroscience is telling us that our behavior, attitude, and personality are ALSO subject to biological factors beyond our conscious control.

**** REDUCED RESPONSIBILITY?**

So what do we do with this knowledge? Does this knowledge from neuroscience REDUCE our responsibility for our behavior? Some people would argue that it does.

--[[return overhead of "proof of not responsible"]]

**** DETERMINISM**

One way this argument is made is by claiming that human behavior is completely deterministic. But does science actually prove the strong claim of Determinism? I don't think so. Science shows us predispositions and factors which influence behavior. In a few cases (for example, Tourette's syndrome) those factors can be overwhelming. But it is a gross extrapolation of current data to claim that Determinism is proven. Not only is Determinism a gross extrapolation, but it sweeps under the rug some other very important data, namely, or ordinary experience of meaningful choice in our everyday lives. So for now, Determinism is a worldview claim is not at all proven, to say the least, by the current scientific data, and seems to contradict our everyday experience..

Some people seem to argue that the Deterministic view of human behavior is actually more compassionate than holding people responsible for their actions. They cite scientific studies (such as the ones on child abuse) to back up the claim that instead of punishing criminals, we should find effective medical treatments to change their behavior, because, after all, they are really not responsible for their behaviors. Although this idea sounds compassionate --- if scientifically premature --- the long-term consequences of this attitude may be anything but compassionate. I sincerely hope that medical treatments may ultimately be useful for rehabilitating some people, but a whole-sale denial of ANY responsibility for criminal actions is profoundly dehumanizing. For then one is essentially denying people the ability and opportunity to choose *anything*, right or wrong, and to take responsibility for those choices. In our compassion to give people the benefit of the doubt and to help them change, we must not deny or take away the very core of their humanity --- the ability, even to a limited extent, to choose between right or wrong. In the long run, such a denial of responsibility will cause more harm than good.

**** COMPARTMENTALIZING BEHAVIOR**

--[[overhead of compartmentalizing behavior]]

But even without adopting Determinism, there is another way people argue that neuroscience knowledge reduces responsibility for our behavior. This argument comes from trying to compartmentalize each behavior into one of the three categories of responsible OR natural OR medical --- along with the underlying assumption that someone is not really responsible for anything in the natural or medical categories. So the argument would go, maybe some behaviors are free choices, but if you can find some genetic marker which correlates with a behavior, or some drug which helps people change a behavior, then you can move that behavior into the "natural" or "medical" category. You can stop holding people responsible for that behavior and instead treat it like a medical condition.

--[[*overhead of C&H "culture of victimhood"']]*

--This is what Calvin is doing. He lists all the factors influencing his behavior until free choice seems to be just squeezed out of the picture.

If you buy into this view, then the more that science learns, the more and behaviors will be moved out of the "responsible" category and into the "medical" category.

I think this approach leads us in the wrong direction. Scientists are continually developing new psychopharmaceutical drugs, like Prozac, which can alter behavior and attitudes. If these drugs are used wisely, they offer great potential for helping to heal people who are suffering. But like any good thing, these psychopharmaceutical drugs can be misused. And if we buy into this compartmental model of behavior -- if we say that any behavior which responds to drugs is a medical condition and thus we are no longer responsible for it, the potential for misusing these drugs is great.

**** COSMETIC PHARMACOLOGY**

Physical pain tells us something important, most of the time. It warns us that part of our body is injured or diseased, and needs rest or medical attention. For some people, the body's pain system is not in proper control. Chronic pain ceases to be a useful warning; it hinders their healing. Powerful analgesics can relieve some of their unnecessary suffering. But suppose we all could take powerful analgesics whenever we felt painful twinges? By using drugs to ignore pain's warning signs, we would multiply our injuries and let disease go untreated, and so hurt ourselves far more severely.

Emotional pain also tells us something important, most of the time. It warns us that part of our psychological, social, or spiritual life needs healing. For some people, imbalances in brain biochemistry cause unnecessary emotional pain, pain which hinders recovery and healing. Psychopharmaceutical drugs such as antidepressants can relieve some of their suffering and aid in healing. But suppose we all could take safe, effective drugs to alter our brain biochemistry whenever we felt twinges of depression, fear, lethargy, guilt, shame, or anything emotionally unpleasant? By suppressing those warning signs, we might cause greater harm to ourselves.

Usually (though not always), it is simple to decide when to medicate physical pain. It is not always so simple with emotional pain. Most people can distinguish healthy grief from pathological depression, but inevitably there are borderline cases. Because of their safety and ease of use, psychopharmaceutical drugs are increasingly being prescribed for what were once considered borderline cases. In fact, some individuals who would otherwise be diagnosed as perfectly healthy do respond, biochemically and emotionally, to antidepressants.

overhead of dangers of cosmetic pharmacology

Researchers are continually developing new psychopharmaceuticals. As these tools become more powerful and more widely available, they offer both greater potential for healing and greater potential for misuse.

One way we might misuse them is by turning to them too quickly to ease emotional suffering. Our society over-values "feeling good" versus building the strength of character which helps us to do good and be good. These drugs will tempt us to settle for emotional pain relief instead of doing the hard work necessary for true healing.

Second, we may be tempted to misuse these drugs to sculpt our personalities and emotional states, to gain a little more of one trait or a little less of another. In his book "Listening to Prozac" (Viking, New York, 1993), Dr. Peter Kramer refers to this as "cosmetic pharmacology." The analogy is to cosmetic surgery. Cosmetic surgery has a spectrum of uses -- from correcting real physical defects on the one hand to prideful, selfish egotism on the other. This same spectrum of uses is becoming possible with psychopharmaceuticals. When every Hollywood actor is surgically sculpted, it reinforces society's idolatrous values. What affect would it have on society if every Wall Street trader took pharmaceuticals to gain a bit more emotional energy and ambition?

Third, we will be tempted to sculpt not only our own personalities, but other's as well. If society values people who are ambitious and energetic, we can prescribe Prozac for people who have less of those qualities. If society values stay-at-home moms who are not ambitious, we can prescribe Valium (as was done in the 1950s) for those who are by nature too active. If society values thin people, new drugs can suppress appetite and alter metabolic rates. If society values quiet and well-behaved children, there's always Ritalin.

Fourth, whenever we find a drug helpful in altering some undesirable attitude or behavior pattern, we will be tempted to forget that deliberate sinfulness may also be part of the problem. We may forget the need for repentance, the need to rely on God as the ultimate source of healing. The secular world dislikes the concept of "sin." Our culture often teaches that if one's genes, childhood experiences, stress, or brain biochemistry contributed to the behavior, then one is no longer responsible for that behavior. But that is far too simplistic. Such a wholesale denial of responsibility ultimately dehumanizes us.

**** HOLISTIC VIEW OF BEHAVIOR**

overhead of holistic view of behavior

But does it even make sense to compartmentalize behavior as either due to free choice OR due to a biological condition? I don't think so. I think that both our everyday experience AND the results of neuroscience are pointing in a different direction. What they indicate is that we cannot separate our biological and psychological aspects. We are whole people. Our physical, neurological, psychological, emotional, and spiritual aspects form a unified whole. They affect each other in ways we are only beginning to learn scientifically.

For example, most recovering alcoholics will tell you that while alcoholism is a disease which may have a genetic factor, the behavior of abusing alcohol is a willfully wrong act. The road to recovery from alcoholism the disease requires daily, difficult, deliberate choices to do the right thing.

The Christian worldview would put it something like this: We are each more prone to some sins than others, and we must learn to avoid situations of temptation. If someone has a genetic predisposition to a particular sinful behavior, they need more help and encouragement from others to help overcome that temptation.

If you are going through an emotional (and therefore spiritual) crisis, you have a number of strategies you could use to address it. You could take a prescription drug, or go on a vacation, or make a change your lifestyle, or get counseling. You could pray, confess, and repent, you could start a spiritual discipline, or go on a spiritual retreat. There is no single strategy that will work for everyone, in every case. For some individuals, the first important step to healing an emotional and spiritual crisis will be a medical treatment (taking a drug, or simply getting the right food, exercise, and rest). For other individuals, such medical treatments would only mask problems which must be addressed, first of all, through counseling, prayer, repentance, and spiritual disciplines. The right strategy of medical, psychological, social, and spiritual approaches must be tailored to each individual's situation, using our best judgment about which to emphasize, and in which order.

--How can you tell which strategy to take? Start with medical treatment or not? I can't give you an answer which will cover every situation. But here's a principle which might help make that decision: Try to figure out which strategy helps you grow the most spiritually --- grow closer to God, to grow increasingly selfless.

For some people, an illness like clinical depression can cripple their spiritual growth. No matter how much they pray or how hard they work at spiritual disciplines, they know they're not making much progress. But the anti-depressant drug changes all that. While they are on the drug, their spiritual life blossoms. They do grow closer to God and more selfless towards others. In this case, it sounds like they're doing the right thing.

For other people in other situations, struggling with a psychological problem, the struggling can be an occasion for real spiritual growth. Taking a medical treatment might anesthetize you to the

problem and stunt spiritual growth. Here's a possible example: suppose you have a bad case of "road rage." You might address the problem spiritually, thinking about your problems with selfishness and impatience, and really work on those problems through prayer, repentance, and spiritual disciplines. And you have a good prospect of making progress this way. But suppose you simply could take a drug which reduced impulsive flashes of anger. It might improve your mood while driving, but if you did nothing else to address the deeper spiritual problems, you would be missing out on an opportunity for growth.

So this is something to check as you chose a strategy: what is helping me to grow closer to God, what is helping me to become more Christ-like in the long run?

God is gracious: Spiritual implications of brain injury or disease

--What about people whose personalities and beliefs (even religious beliefs) change due to injury or disease. Example: an old Jewish man with Alzheimer's who discovered bacon and really liked it and wanted to keep eating it.

--God is gracious. And we don't earn God's saving grace by obeying certain commands, or even by stating our intellectual agreement to a list of propositions. Those things can change due to brain illness or disease. We don't know what "spiritual status" God gives to these situations, but we do know that God is gracious, and we can trust that.

--Also, there are two ways of thinking about "what is a human being." One way is: Who-you-are-right-at-this-moment-in-time. Another way is: Who-you-have-been-throughout-your-whole-life. (Old saying: a man is what he has done during his life.) It may be that who-we-are-in-eternity has at least as much to do with the second answer as the first. (Theological tie-ins: The idea of sanctification. The fact that everything we do has eternal consequences.) If so, we certainly needn't worry about changes which happen to our brains due to disease or injury. In any case, we still trust God's graciousness.

**** "TAKING" RESPONSIBILITY**

overhead of "taking responsibility for behavior"

I would summarize this with the phrase "taking responsibility" for a situation. Note the peculiar phrase, *taking* responsibility. It acknowledges that factors beyond our control were, to a greater or lesser extent, responsible for our current unpleasant situation -- whether that is drug addiction, or depression, or a quick temper, or a hateful or prideful attitude. However, now that we are aware of those factors, we can do something about them, which makes us RESPONSIBLE for doing something about them. We take responsibility. Now we have to choose the effective strategy which combines spiritual, psychological, physical, and perhaps medical activities.

If you compartmentalize behavior as free choice OR biological, then any time you identify factors beyond your control which have affected your behavior, you can claim reduced

responsibility. But if instead of compartmentalizing behavior, we view ourselves as whole, integrated beings, things look very different. Knowledge from neuroscience doesn't REDUCE our responsibility for our behavior, rather, it increases our responsibility. Once we have identified those factors beyond our control -- whether disease or psychological trauma or genetic and biochemical factors -- we can take responsibility for developing an effective strategy for dealing with them.

--[[*overhead of C&H "build more character"*]]

--Calvin thought that by listing factors which influence his behavior, he could reduce his responsibility. But Calvin's dad was exactly right. Now that we've identified the problem, our responsibility for our behavior has actually increased.

**** BRAIN BIOCHEMISTRY AND EVERYDAY LIFE**

Brain biochemistry isn't just a medical matter. It affects each of us every day.

--[[*overhead of C&H "achieve a lower consciousness"*]]

--[[*overhead of C&H "feel neurotransmitters shutting down"*]]

Consider how your mood, your behavior, your attitudes respond to caffeine, or eating too much junk food, or simply getting sufficient food, rest, and exercise. These things can affect your behavior, how you respond to stressful situations, how easily you are angered, how much energy you have, how attentive you are when listening to a friend, how well you can concentrate while reading the Bible, praying, and worshipping. So everyday physical things like what we eat and what kind of physical activity we get have spiritual consequences. They're important.

If you've had a long, horrible, stressful day, you might desire both to pray about it and to eat some "therapeutic chocolate." If you turn first to chocolate, it might be so therapeutic that you forget to pray; alternatively, it might help you think more clearly and pray more effectively. So we need discerning judgment about these things even in our everyday lives.

From discussion: There is a danger here that we might get **too** introspective. Remember a very good spiritual discipline: helping others who are suffering more than you are. That spiritual discipline is good in many ways, and is a great antidote for becoming too introspective and self-absorbed.

**** WHAT ABOUT "SIN"?**

In this week's title, I mentioned the word "sin." If someone behaves in a nasty way towards other people, and that nasty behavior is heavily influenced by biological and biochemical factors, does it still make sense to call it "sinful"?

overhead of sin = individual sins and original sin

Actually, it does, if we remember what Christian theology teaches about sin. The Bible talks about "sin" both as individual choices AND as our entire sinful condition -- sometimes called "original sin." The concept of "sin" covers both our individual decisions to do evil things, and our general predisposition to do evil things. And the gospels and letters in the New Testament teach that Jesus Christ came to overcome BOTH of those problems and so to reconcile us to God.

We need to remember that "sin" does not start with, nor consist entirely of, nasty behavior towards other people. Sin starts with turning away from God. No matter what your genes, childhood experiences, or biochemical condition --- no matter how nice or nasty you happen to be at this moment due to factors beyond your control --- you always have the choice to turn towards God, or to turn away from God.

C.S. Lewis wrote about this in his book "Mere Christianity." The following is taken from the chapter entitled "Nice People or New Men."

You cannot expect God to look at Dick's placid temper and friendly disposition exactly as we do. They result from natural causes which God Himself creates. Being merely temperamental, they will all disappear if Dick's digestion alters. The niceness, in fact, is God's gift to Dick, not Dick's gift to God. In the same way, God has allowed natural causes, working in a world spoiled by centuries of sin, to produce in Miss Bates the narrow mind and jangled nerves which account for most of her nastiness. He intends, in His own good time, to set that part of her right. But that is not, for God, the critical part of the business. It presents no difficulties. It is not what He is anxious about. What He is watching and waiting and working for is something that is not easy even for God, because, from the nature of the case, even He cannot produce it by a mere act of power. He is waiting and watching for it both in Miss Bates and in Dick Firkin. It is something they can freely give Him or freely refuse to Him. Will they, or will they not, turn to Him and thus fulfill the only purpose for which they were created? Their free will is trembling inside them like the needle of a compass. But this is a needle that can choose. It can point to its true North; but it need not. Will the needle swing round, and settle, and point to God?

He can help it to do so. He cannot force it. He cannot, so to speak, put out His own hand and pull it into the right position, for then it would not be free will any more. Will it point North? That is the question on which all hangs. Will Miss Bates and Dick offer their natures to God? The question whether the natures they offer or withhold are, at that moment, nice or nasty ones, is of secondary importance. God can see to that part of the problem.

Of course God regards a nasty nature as a bad and deplorable thing. And, of course, He regards a nice nature as a good thing -- good like bread, or sunshine, or water. But these are the good things which He gives and we receive. He created Dick's sound nerves and good digestion, and there is plenty more where they came from. It costs God nothing, so far as we know, to create nice things: but to convert rebellious wills cost Him crucifixion. And because they are wills they can -- in nice people just as much as in nasty ones -- refuse His request....

"Niceness" -- wholesome, integrated personality -- is an excellent thing. We must try by every medical, educational, economic, and political means in our power, to produce a world where as many people as possible grow up "nice;" just as we must try to produce a world where all have plenty to eat. But we must not suppose that even if we succeeded in making everyone nice we should have saved their souls. A world of nice people, content in their own niceness, looking no further, turned away from God, would be just as desperately in need of salvation as a miserable world -- and might even be more difficult to save. For mere improvement is no redemption, though redemption always improves people even here and now and will, in the end, improve them to a degree we cannot yet imagine.

Brain, Biology, and Behavior

Claim: "Noble sentiments" such as love, altruism, etc. are nothing but biological drives to preserve the species.

--This is another example of the fallacy of "nothing but-tery."

--Christians theology has no objections to these "noble sentiments" having, at least in part, a biological basis. In fact, we would expect them to have some biological basis. God made us in his image; God made us capable of love and altruism; it is part of our created nature.

Biblical principles regarding behavior:

--We are to examine our own behavior, confess our sins, and repent of them.

--We are to encourage the spiritually weak who are struggling with temptation.

--We are to minister to the sick, and try to heal them if possible.

--We are to value the variety of non-sinful differences in other people, since these may reflect God's special gifts to them and to the church.

How society typically classifies behavior:

Usually, society tries to classify each behavior *entirely* into one of these three categories:

Free choice: The behavior was freely chosen by the individual.

Implication: Hold people responsible for bad behavior, punish them.

Illness: The behavior was caused by a medical condition.

Implication: Treat them with drugs, therapy, and other medical interventions.

Natural: The behavior falls within the variability of how normal, healthy people behave.

Implication: As long as they're not hurting anyone else, leave them alone.

Biological factors which influence behavioral choice:

Neurodegenerative disease or brain injury. (e.g. brain tumor, Alzheimer's disease, Tourette's syndrome.)

Can alter behavior and in some cases personality. Changes can occur slowly or suddenly.

Psychological trauma. (e.g. being abused as a child.)

Can have long-lasting effects in the brain which play a role in later behavior.

Genetic predispositions. (e.g. some forms of alcoholism, some forms of obesity.)

Particular genes affect brain functioning to predispose people towards certain behaviors.

Evolutionary psychology. (e.g. hypothesis linking social status, serotonin levels, and use of violence.)

Attempts to understand human behavior patterns as strategies for survival and reproductive success in a complex social hierarchy.

Brain biochemistry. (e.g. some forms of clinical depression.)

Behavior and personality can be profoundly influenced by neurotransmitter levels and by drugs which alter those levels.

Our behavior, attitude, and personality are very much subject to our conscious, deliberate choices in our everyday lives. But we are learning that our behavior, attitude, and personality are *also* subject to biological factors beyond our conscious control.

Claim: If we identify biological factors influencing a behavior ==> then we shouldn't hold people responsible for it.

Version 1: Human behavior is completely deterministic. This claim is a gross extrapolation of current data and ignores the data of the meaningful choices we experience in our everyday lives.

Version 2: Compartmentalizing behavior. It is too simplistic to categorize behavior as freely chosen *or* determined by biological factors. Whatever our biological condition (except in the most extreme cases), we can make deliberate choices to either succumb to, or to overcome, behaviors to which we might have a predisposition. (*e.g. overcoming alcoholism through deliberate choices.*) Biological factors may make this easier or more difficult.

"Cosmetic pharmacology": As we learn more about biochemical influences on behavior, we will better be able to help suffering people. We will also have a greater temptation to *misuse* this knowledge, in ways analogous to how cosmetic surgery is sometimes used for idolatrous reasons. We might use this knowledge to ease our emotional suffering without dealing with the underlying problems. We might try to "sculpt" our personalities. We might inappropriately convince or coerce others to do the same. Whenever we find medical techniques helpful in altering some undesirable attitude or behavior pattern, we will be tempted to forget that deliberate sinful choices are part of the problem.

Holistic view of behavior: Our physical, neurological, psychological, emotional, and spiritual aspects form a unified whole which influence each other in ways we are only beginning to learn about scientifically. For some individuals, the first important step to healing an emotional and spiritual crisis will be a medical treatment (taking a drug, or simply getting the right food, exercise, and rest). For other individuals, such medical treatments would only mask problems which must be addressed, first of all, through counseling, prayer, repentance, and spiritual disciplines. The right strategy of medical, psychological, social, and spiritual approaches must be tailored to each individual's situation, using our best judgment about which to emphasize, and in which order. The right strategy will help us to grow spiritually, to grow closer to God.

God is gracious: Brain disease and injury can cause changes in personality and beliefs. However, we don't earn God's saving grace by obeying certain commands, or even by stating our intellectual agreement to a list of propositions. We don't know what "spiritual status" God assigns to situations of brain disease or injury, but we do know that God is gracious, and we can trust that. Our eternal relationship with God has already begun in the here-and-now. "Nothing can separate us from the love of God."

"Taking" responsibility: We acknowledge that factors beyond our control were, to a greater or lesser extent, responsible for our current unpleasant situation -- whether that is drug addiction, depression, a quick temper, or a hateful or prideful attitude. Now that we are aware of those factors, we can do something about them. This knowledge *increases* our responsibility for our behavior, rather than decreasing responsibility.

Brain biochemistry and everyday life: Activities like eating too much junk food, drinking caffeine, or simply getting sufficient food, rest, and exercise can influence our behavior, our attitudes, our temper, our

patience, and how well we concentrate during spiritual disciplines. "Physical" activities like eating and exercising have spiritual consequences.

What about "sin"? Christian theology refers to "sin" *both* as specific choices/actions *and* as our entire sinful condition ("original sin"). The Son of God came to earth to overcome both of these problems and so restore us to God. Sin does not consist only of nasty behavior towards others. Sin is turning away from God.

Suggested non-technical readings about biochemistry and behavior:

"Seeking the Criminal Element" by W. Wayt Biggs. *ibid* p.102-110.

"The Biology of Violence" by Robert Wright, in *The New Yorker*, March 13, 1995, p.68-77

"One Pill Makes You Larger, One Pill Makes You Small" by Sharon Begley, in *Newsweek* February 7, 1994, p.37-40.

Listening to Prozac by Peter D. Kramer. (Viking, New York, 1993).

The Man Who Mistook His Wife For a Hat and Other Clinical Tales by Oliver W. Sacks. (Harper, New York, 1990).

Christian perspective on neuroscience:

The Open Mind by Donald M. Mackay. (InterVarsity Press, Leicester, England, 1988). Chapters 1 and 5.

"Nice People or New Men" in *Mere Christianity* by C.S. Lewis. (Macmillan, New York, 1984).