For my participation in the panel discussion on Science in the Liberal Arts, I was asked to consider the question of how science should be taught differently in a liberal arts context in order to meet our distinctive goals. I would like to tackle this question in two parts. First, I want to ask what our distinctive goals might be (I want to reframe this question in terms of responsibilities rather than goals); and second, I want to contextualize some answers to this reframed question in Westmont’s particular context as an Evangelical, Protestant Christian Liberal Arts college. In service of this second part, I offer an example of science contextualized to meet distinctive goals of a liberal education: the nature of the soul and the meaning of personhood in light of current work in neurobiology and the cognitive neurosciences.

II

First, then, what are our distinctive goals with respect to science? On the one hand, I don’t know that our goals with respect to science are much different than they are at other types of institutions—good science is good science. On the other hand, good science can be taught in many ways, and the liberal arts context may lend itself to some rather than others of these ways. Rather than speaking about goals, however, I’d like to reframe this question in terms of responsibilities. To whom are we—the faculty and administrators of the colleges and universities providing a liberal education—responsible? And what are those responsibilities?

Most obviously, we have responsibilities to our students. We have contracted with them, explicitly and implicitly, and promised a certain kind of education—a liberal education. We should read our own marketing material to find out just what it is that we are promising.

Second, we have responsibilities to the liberal arts community and tradition: our way of doing liberal arts today partly determines what the definition of liberal arts will be tomorrow. Third, we have responsibilities to the various communities in which our students will find themselves after graduation, the communities within which our institutions are situated. For example, we promise something to the countries of which they are citizens. It is a longstanding tradition in liberal education to produce good citizens and responsible, capable leaders. But as we move into the twenty-first century, we find that we are also in the business of shaping citizens of the global community. Cultivating a citizen of the world presents different challenges than cultivating, say, a citizen of nineteenth century United States or a citizen of the Athenian republic. In addition to countries and the world, there are other, more situated communities to which
we bear responsibilities. In Westmont’s case, these include the Christian community broadly and the Protestant Evangelical community more narrowly. It is not always clear what these more situated communities are, but I believe it is well worth our time to figure out whom we are serving. As our current students live out their lives over the next sixty to eighty years, there are and will be questions of central importance within all of these various communities, many involving science and technology. We have a responsibility to these communities to produce students who can contribute thoughtfully to those discussions. And it’s about more than just discussion—at least some of our science students ought to be making active contributions as practitioners of their science—as doctors, basic researchers, engineers, etc.

Third (and my list is not exhaustive), we have obvious responsibilities to our students’ future employers, including graduate schools. In this respect the liberal arts colleges must not be deficient in their technical and professional training, even though we are not technical and professional schools. A liberal arts science degree must provide not only the historical and multidisciplinary context of a science, but the important skills and knowledge bases of the scientific disciplines in which our students specialize.

In summary, we must carefully consider not only what our distinctive goals are, but to whom we are responsible and what those responsibilities are in our particular institutional contexts. What is my institution promising its students? In which communities is my college situated, and what are the important questions within those communities? Answers to these questions will provide a unique (or at least distinctive) context for teaching science.

III

So how might we go about structuring our curriculum and teaching our courses to meet these goals, to make good on our responsibilities? Certainly there are many fruitful paths to take in answering this question, ones that occupy a good deal of our thinking already: how should we structure our general education curriculum in the sciences so that it maximally benefits science majors and non-majors? How much of our resources should be devoted to laboratory and field instruction, and to supervision of independent research projects for our undergraduates? My concern in the remainder of this paper, however, will center on the connections that we make in our science classes with other disciplines and broader issues.

Liberal arts has, I think, a lot to do with connections. We connect ourselves to our disciplinary histories and to the history of science and civilization generally. We connect our academic disciplines to our faith and/or cultural traditions and to the liberal arts traditions. We connect the various subdisciplines with our disciplines, and we connect our own discipline with other academic disciplines, including those in the other sciences and in the humanities. In the liberal arts, philosophy has played an important role in this respect. At Westmont and the other Christian colleges, theology and Biblical studies have played an equally important role.

In my neuroscience and psychology courses, philosophy’s mind/body problem has provided an opportunity to help my students make connections. One reason for this is that the question of the mind’s relationship with the body is just
inherently interesting—everybody seems to be intrigued by this puzzle, regardless of academic or faith background. It is particularly interesting to students in the Christian tradition, though, because of the theological issues it touches: what is the nature of the soul? Do other animals “have souls,” and if so, how does this fact influence our ethics? What happens to us after bodily death—does the soul continue on? As a psychologist, I’ve always thought that I should be able to bring my discipline (which is, after all, “the study of the soul”) to bear on questions related to the soul; as a neuroscientist, I have been similarly attracted to related questions regarding the mind-body problem. While a discussion of whether the Hebrew and Christian scriptures present an ethereal heaven or a bodily resurrection have little direct bearing on, say, the molecular structure of sodium ion channels and their role in neuronal action potentials, such discussions do seem to increase motivation for scientific understandings of the human person. What, my students wonder, does it mean to be a human person? What do the scriptures and traditions really teach about life after death, about the nature of the soul, or about God’s action in the natural world?

Body, mind, and soul issues also allow connections with philosophy. Issues of emergence and reductionism, nature and nurture, dualism and physicalism are probably more relevant than most of us in the sciences realize. For our students who encounter these issues in general education or elective courses, making the connections in the psychology and neuroscience classroom make philosophy and science both come to life.

Questions about body, mind, and soul are “hot topics” now, as evidenced by the abundance of popular scientific books on the market (LeDoux, Damasio, Crick), and a number of theological books have begun to appear that address the scientific issues (Brown et al., Cooper, Hasker). The intersection of science and faith surrounding body/soul issues has even found its way into popular historical works (Zimmer) and even best-selling fiction (Saltzman). All of these books make excellent readings in relevant science classes, and I find that merely recommending them casually in lecture results in more than a few students buying and reading them. A short list of recent books is given in the works cited list at the end of this paper.

I conclude this paper with a brief presentation of some thoughts on neuroscience, psychology, and the soul. This represents an approach to the mind/body/soul relationship known as non-reductive physicalism and has emerged in both Christian scholarly and philosophical circles as a leading alternative to mind-body dualism on the one hand and reductive physicalism on the other. More generally, it represents a contextualized, integrative approach to teaching science in the liberal arts.

The word psychology literally means the study of the psyche, the soul. If the scientist is committed to the idea of a natural world that works according to its own laws, without non-physical vital substances to animate it, does that force her to conclude that humans have no souls? The progression of the neural and psychological sciences has been decidedly in the direction of humans as lawful, physical systems and away from the idea of a separate, Cartesian, immaterial soul. The Bible, on the other hand, is filled with the language of human souls and

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1This concluding material was previously published in a 2004 collection of papers by the Institute of Liberal Arts (Christian Perspectives on Liberal Arts Education) under the title The Christian Liberal Arts Scholar: A View from the Psychological Sciences.
spirits, constructs that play no small part in the doctrines of the church and the faith of Christians worldwide. How is the Christian scholar, committed to disciplinary excellence and theological fidelity, to reconcile these seemingly incompatible calls?

First, let me suggest that the meaning of soul, whole person, self, and related terms are central concepts in the liberal arts, regardless of the words we use to name them. The Christian scholar in the liberal arts has every reason to retain these concepts as more than merely historically cute phrases. When we in the church and the academy talk about developing the whole person, or about loving the Lord with all our hearts, minds, souls, and strength (to quote the Hebrew Shema prayer of Deuteronomy 6 and its expression by Jesus in Matthew 22), we must have some notion of what we mean.

The question of how we are constituted, of what our parts are and what it means to be a whole person, is obviously intertwined with the questions of nature/nurture, freedom/determinism, and emergence/reductionism. As Christian scholars in the neural and psychological sciences, we are committed to a number of things.

We are committed to the idea that humans have worth and dignity, that we have certain uniquely human capacities (particularly our relational and social capacities, but also certain types of abstract thought and language). In this sense, humans have souls, and the Christian scholar would necessarily reject reductionist accounts of the person that denied these things. Consider, though, that whether these souls are constituted of purely neurophysiological processes or involve some additional, immaterial substance is a separate question.

We are also committed to the idea that human persons have continued existence as individual selves after the death of our bodies. Whether this is exclusively a matter of bodily resurrection (which is, by the way, the primary teaching of scripture on life after death) or involving a disembodied “intermediate state” between death and resurrection is a matter of further consideration.

In addition to theologically-based commitments to the dignity and worth of human persons now and to continued life after death, we are also committed to the methods and principles of our scholarly disciplines. As participants in the “science of the soul,” psychologists must reconcile the ideas of body and mind, of the lawful physical matter of science and the free, eternal soul of theology.

One way to reconcile these concepts is called non-reductive physicalism. The essential claims are (1) that human beings are purely physical, made entirely of the same sorts of matter that the rest of nature is made from, (2) that this matter is arranged in such a way that we have uniquely human capacities, and (3) that these human capacities, although derived entirely from matter, cannot be explained merely by reductionistic accounts of that matter. Such an approach is preferred by biologically-minded psychologists because it comports well with what appears to be the trajectory of the relevant sciences, and because it also comports well with scripture and essential doctrines of the Christian faith.

There are other ways to reconcile the sciences and the soul including holistic dualism, the idea that the human person is a psychosomatic unity (body and soul are distinct, but inseparable), and more radical positions such as radical substance dualism (where the mind/soul is separable from the body). There have been few attempts to develop these various forms of dualism in such a way that they are compatible both with a Christian worldview and with the methods, principles,
and findings of the brain and behavioral sciences. Although I myself am partial to the non-reductive physicalist approach, I expect that such dualist programs, undertaken in the spirit of the Christian liberal arts, would be of real and lasting benefit to both the church and to the neural and psychological sciences.

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Questions like freedom and determinism, nature vs. nurture, reductionism vs. emergence, and the mind/body problem are exemplary of the big questions that endure through the ages. The Christian liberal arts enterprise is in large part about resisting the temptation to eschew these sorts of questions for narrow disciplinary specialty, but it is also in large part about owning a disciplinary specialty enough to bring it to bear on such questions. And it is about doing so in ways that honor Christ.
Works Cited


