

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/255570890>

# Evolution, Religion, and Race: Critical Thinking and the Public Good

Article · January 2009

---

CITATION

1

READS

394

2 authors, including:



Joseph L. Graves Jr

North Carolina Agricultural and Technical State University

56 PUBLICATIONS 1,589 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Experimental evolution of antimicrobial resistance [View project](#)



BEACON: An NSF Center for the Study of Evolution in Action [View project](#)

## **Evolution, Religion, and Race: Critical Thinking and the Public Good**

Joseph L. Graves Jr. and Gary Bailey

Joseph L. Graves Jr., Dean, Division of University Studies & Professor Biological Sciences, North Carolina A&T State University

Gary Bailey, Religious Studies, Division of University Studies, North Carolina A&T State University

### **I. Critical Thinking, Religion, and Race: Why Critical Thinking Matters**

It is the intention of this paper to address certain issues concerning the relation between science, religion, and the public good. These relations are often discussed without clear, critical articulations of what is meant by the terms and without clear, informed understandings of what others, particularly those outside of a given discipline, mean by the terms. For example, discussants often assume their own particular, experiential understandings of religion, without expressing knowledge of the diversity of religions in the world, or even the diversity of historical manifestations of their own religions. Many discussants are unaware of critical scholarship in the study of religion, including informed and intense argument over definition, theory, and meaning of religion in human history. Likewise, discussants often assume narrow understandings of science. Many equate “science” with the natural sciences, and even more narrowly, with a stable body of knowledge about the natural world, as opposed to broad processes of critical inquiry into many different objects, including natural, social, and aesthetic objects. The 19<sup>th</sup> century Continental understanding of science as critical and systematic inquiry into all possible areas of thought is largely unknown in contemporary discussions in which the term “science” appears.

This paper will do two things. First, we will define what we mean by “science” in differentiation from “religion” and articulate how we believe science and religion should be related. By science we mean a set of critical principles and rules for evaluating and testing data and arguments about the meaning of data. Such principles and rules are appropriate for investigating all areas of experience, including natural, social, and aesthetic phenomena. In order to obviate too-narrow understandings of “science” we will use the phrase “critical thinking” to refer to these principles and rules. As for religion we will remind readers both of the wide diversity of religious traditions and the wide diversity of scholarly interpretation of religion. Whether and to what extent religion and science are compatible depends centrally on how both religion and science are defined and understood. Many broad religious traditions include strands that understand religion and science in ways that make them necessarily antagonistic to one another, as well as strands that understand them in ways that make them compatible, complementary, or even identical. Fruitful discussions about the proper relations between science and religion require careful definitions and presentation of this historical and conceptual diversity. We will argue for the view that all religion should be governed by the principles and rules of critical thinking. In the second part of the paper we will provide examples that demonstrate how religious views that contradict critical, scientific thinking lead to pernicious consequences for those who hold the views, for particular individuals and groups that are damaged collaterally, and for the larger public.

What is science? We mean by “science” the various, broad-based methods of discovery, critical thinking, experimental testing, systematic critique, and collaborative discussion used in principle by all of the modern scientific disciplines, including the social, natural, and text-interpretive sciences. Central to all these disciplines, but employed in different ways on different objects by each, are the following:

- basic principles of logic and inferential thinking: principles of identity, contradiction, and excluded middle, and deductive and inductive inference; perhaps no rule of thinking is more important than the following: treat like cases alike;
- admitting ignorance, asking questions, desiring to know;
- A commitment to admit only that evidence which is in principle available to any and all investigators;
- developing informed, fruitful, falsifiable hypotheses in response to the questions;
- drawing implications of the hypotheses;
- developing controlled, replicable experiments that allow one to test the hypotheses;
- Submission of the entire experimental process and results (questions, hypotheses, and experiments) to the public for discussion and debate
- The willingness to admit error and ignorance throughout the process, even when the evidence appears overwhelmingly strong;
- Careful attention to, and control for, the manifold ways in which human beings deceive themselves and/or are deceived by biases (social, psychological, ideological, etc.).

We believe that it is better to use one's reason, and think critically, than not to use it, and it is better to submit all thinking to these principles and rules than not. This commitment to evidentiary critical thinking is grounded in traditions of human inquiry and human practice which have demonstrated its fruitfulness for both contemplative and practical satisfaction. Human beings desire to know and desire to do things in the world. The various methods of inquiry derived from the components of critical thinking outlined above have proven themselves to be both useful for achieving basic human needs and desires, as well as satisfying in themselves. We readily admit that our commitment to these methods is a matter of faith. There is no non-rational, and therefore non-circular, independent ground which provides a foundation for our belief in and commitment to critical thinking. In that sense, our faith in critical thinking is circular.<sup>1</sup> There is also no access to the meanings and standards of inquiry, truth, goodness, and beauty than through traditions of human reflection and dialogue. Truth, goodness, and beauty, are communal concepts that emerge through dialogue, discussion, vigorous presentation, critique, defense, and modification. Critical thinking is a self-productive activity which requires serious and intense reflexive thinking about thinking, along with the psychological, social, and political conditions that permit thinking about thinking to flourish.<sup>2</sup> The traditions from which we draw include Plato's Socrates discussions of dialectic, Aristotle's logic, and the many ancient,

---

<sup>1</sup> We will not introduce and discuss in this essay efforts by some religious and theological writers to use Postmodern literary theory and philosophical approaches to revivify the persuasive force of particular truth claims for particular religious traditions. Such attempts can be more or less sophisticated. In general, we view such attempts as violations of the principle of treating like cases alike.

<sup>2</sup> See discussions of the nature of thinking and tradition in G. W. F. Hegel, *Phenomenology of Spirit*; *Logic*; *Philosophy of Spirit*; F. D. E. Schleiermacher, *Dialektik*. See also Alasdair MacIntyre, *Whose Justice? Which Rationality?* and *After Virtue*; Hans Georg Gadamer, *Truth and Method*; Richard Rorty, *Philosophy and the Mirror of Nature*; *Contingency, Irony, and Solidarity*; Richard J. Bernstein, *Beyond Objectivism and Relativism: Science, Hermeneutics, and Praxis*; various works by Paul Ricoeur; Jeffrey Stout, *Democracy and Tradition*; and Seyla Benhabib, *Situating the Self: Gender, Community and Postmodernism in Contemporary Ethics*.

medieval, and modern participants in this tradition of logic and dialectic. Our traditions also include Francis Bacon and others who developed the principles and rules of empirical inquiry, John Stuart Mill who developed and articulated principles and rules of hypothetical reasoning and democratic dialogue and freedom of speech, and important representatives of the hermeneutics of suspicion, the practitioners of culture critique, including David Walker, Friedrich Nietzsche, Karl Marx, and Sigmund Freud, all of whom taught us especially to look for hidden motives and causes of cultural phenomena.

What is religion? There is much debate among scholars about the meaning of the word “religion.” For example, many contemporary theorists insist that religion is indefinable, apart from descriptions of its particular manifestations.<sup>3</sup> There simply is nothing, in general, which corresponds to the word. For some of these theorists, the term is a construct that has come to refer to various cultural artifacts (institutions, rituals, meanings) for which there is no essential defining characteristic. Going further, many social critical scholars and theorists insist that “religion” is a category of Western Colonialism, a means of controlling cultural components of “Others.” More traditional scholars offer definitions which vary from descriptive to normative. Furthermore, judgments about the relation between religion and science may or may not depend upon how religion is defined.

Typically, there are cognitive theories, psychological theories, sociological theories, and normative or religious/spiritualist theories.<sup>4</sup> Although they differ on details, classical cognitive theorists (E. B. Tyler, James Frazer, E. O. Wilson) argue that religion has its origin and meaning in proto-natural science: early human beings needed understandings and explanations of the natural world in order to establish a context for practical decision making and environment manipulation.<sup>5</sup> For these theorists, religion has its origin and meaning in pre-scientific cosmologies and anthropologies. In this sense, religion is not so much contrary to science, as it is an inadequate, early stage of thinking that eventually led to scientific thinking. Once modern science developed, religion is dispensable. Contemporary cognitive science theories (Pascal Boyer, Justin Barret, Scott Atran) build on cognitive and evolutionary psychology to argue that the human mind has evolved certain capacities that either directly or indirectly tend to produce the kinds of beliefs that are often associated with religion. For example, several scholars argue that religion, defined as belief in supernatural beings, is directly related to an evolved capacity to

---

<sup>3</sup> Cf., Daniel L. Pals, *Eight Theories of Religion* (Oxford: Oxford University Press, 2006); Malory Nye, *Religion: The Basics* (New York: Routledge, 2003), 6-19; Gary Lease, “The Definition of Religion: An Analytical or Hermeneutical Task?” *Method and Theory in the Study of Religion* Volume 12 Issue 1 / 2 (2000) 287-293, esp., 291; Gregory R. Peterson, “Going Public: Science-and-Religion at a Crossroads,” *Zygon* Vol. 35 No. 1 (March 2000), 13-24, esp. 18-20, 23; William Herbrechtsmeier, “Buddhism and the Definition of Religion: One More Time,” *Journal for the Scientific Study of Religion* 32 (1) (1993): 1-18; in contrast, see Marco Orru and Amy Wang, “Durkheim, Religion, and Buddhism,” *Journal for the Scientific Study of Religion* 31 (1) (1992): 47-61; For a discussion of how best to define religion within the context of U.S. constitutional democracy, see “Toward a Constitutional Definition of Religion,” *Harvard Law Review*, Vol 91 (1978): 1056-1089;

<sup>4</sup> See Daniel Pals, *Eight Theories of Religion*; Mircea Eliade, “Religions: The First Approaches: Philology (Max Müller) and Anthropology (E. B. Tylor)” *International Social Science Journal* Vol. 29 Issue 4 (November 1977): 615-627.

<sup>5</sup> Cf., E. O. Wilson, *Consilience: The Unity of Knowledge* (New York: Vintage Books, 1998), 260-290; E. B. Tylor, *Primitive Culture: Researches in the Development of Mythology, Philosophy, Religion, Language, Art, and Custom*. 4<sup>th</sup> ed. revised. 2 volumes (London: John Murray, 1871, 1903); Martin D. Stringer, “Rethinking Animism: Thoughts from the Infancy of our Discipline” *Journal of the Royal Anthropological Institute* Vol. 5 Issue 4 (December 1999): 541-556. James B. Frazer, *The Golden Bough: A Study in Magic and Religion: A New Abridgement from the Second and Third Editions* (New York: Oxford University Press, 1998).

detect agency in nature.<sup>6</sup> These scholars argue that it tends to be more advantageous to assume that an unknown  $x$  is an agent than it is to assume that the unknown  $x$  is not an agent. Belief in gods and other non-natural beings is an extension of this natural human tendency. For these theorists, religion can be either dispensable or indispensable. Religion is dispensable if one is interested primarily in the truth or falsity of an object's existence and agency. Religion is, perhaps, adaptively useful, if not indispensable, if believing in non-evidentiary objects and agency is an evolutionarily evolved psychological need which must be met for (most) humans to be happy or psychologically and socially integrated. Psychological theories (Ludwig Feuerbach, Freud, Jung) argue that religion is rooted in human psychological needs or structures: whether the need to create imaginary images that help one feel secure and safe in an otherwise hostile or indifferent but dangerous world (Freud), or the symbolization of ideals of human and cosmological integration or self-transcendence (Jung).<sup>7</sup> For psychological theories of religion, religion may or may not be in conflict with science and thus may or may not be dispensable. For Freud, religion was alienating and dispensable; for Jung, it was not. Feuerbach is more complex since his projection theory allows for the possibility that religion is a valuable means whereby human self-alienation can be overcome, even if religion itself is only a means and not an end.<sup>8</sup> Sociological theories (Marx, Durkheim) argue that religion has its origin and meaning in the community's need to subordinate individuals to the common good: religious rituals, symbols, and institutions function to integrate individuals into the common community project by providing a common language, values, and operant conditioning structures.<sup>9</sup> For these theories, religion may or may not be in conflict with science depending upon the communities and interests the religions serve. Normative or spiritualist theories (Rudolf Otto, Mircea Eliade, Paul Tillich, and most recently John Hick) argue that religion is a means by which human beings strive for or are grasped by a non-human, and non-natural reality: these theories attempt to provide support for the view that religion is valuable and important for humans, insofar as they put human beings in touch with a non-human, non-natural reality that provides meaning for human life in addition to religion's social, psychological, or intellectual utility.<sup>10</sup> Often, these

---

<sup>6</sup> Justin Barrett, *Why Would Anyone Believe in God?* (New York: Altamira Press, 2004): 21ff.; Pascal Boyer, *Religion Explained* (New York: Basic Books, 2004): 144ff.; Scott Atran, *In God's We Trust: The Evolutionary Landscape of Religion* (Oxford: Oxford University Press, 2002): 59ff.; Holmes Ralston, III, *Genes, Genesis and God: Values and Their Origins in Natural and Human History*, (New York: Cambridge University Press, 1999): 292-371; Stewart Guthrie, "A Cognitive Theory of Religion" *Current Anthropology*, Vol. 21, No. 2 (April 1980): 181-203; Theodore Vial, "How Does the Cognitive Science of Religion Stack Up as a Big Theory *à la* Hume?" *Method and Theory in the Study of Religion* 18: 351-371; David Sloane Wilson, "Testing Major Evolutionary Hypotheses about Religion with a Random Sample," *Human Nature* Vol. 16 No. 4 (Winter 2005): 382-409; <sup>7</sup>See Sigmund Freud, *The Future of an Illusion* and *Totem and Taboo*; Carl Jung, *Archetypes of the Collective Unconsciousness*, second edition, translated by William McGuire (Princeton: Princeton University Press, 1969); *Psychology and Religion* (The Terry Lectures), (New Haven: Yale University Press, 1960); and "Religionless Christianity," translated by Mrs. Stephen Benko, *Journal of the American Academy of Religion* Vol. 39, No. 1 (March 1971): 43-47.

<sup>8</sup> Ludwig Feuerbach, *The Essence of Christianity*, translated by George Eliot (New York: Prometheus Books, 1989); *The Essence of Religion*, translated by Alexander Loos, (New York: Prometheus Books, 2004).

<sup>9</sup> See Durkheim, Emile, *The Elementary Forms of Religious Life*, translated by Karen E. Fields (New York: Free Press, 1995); Karl Marx, *Marx and Engels on Religion*, translated by (Fredonia Books, 2002).

<sup>10</sup> See Mircea Eliade, *The Sacred and the Profane: The Nature of Religion* (New York: Harcourt Brace Jovanovich, 1987); John Hick, *An Interpretation of Religion: Human Responses to the Transcendent*, second edition (New Haven: Yale University Press, 2005); Paul Tillich, *The Courage to Be* (New Haven: Yale University Press, 2000) and *Dynamics of Faith* (New York: HarperOne, 2001); Rudolf Otto, *The Idea of the Holy* (Oxford: Oxford University Press, 1958).

theories utilize metaphors like “depth” to refer to or symbolize the import of religion for human psychological and spiritual health. From the point of view of normative theories of this type also, religion may or may not be in conflict with science, depending upon the nature of the religion and the ways in which the relation to society and modern natural science is constructed. For example, Paul Tillich emphasized the “demonic” capacity of religion, a characteristic of religion which occurs when participants mistake finite objects as infinite.

A fifth type of theory, or quasi-theory, should be mentioned here insofar as it informs the debate between evolution and creationism: the confessional theory. We will call this a quasi-theory since it is specifically formulated as a denial of a theory. This quasi-theory of religion is best known from the early work of Karl Barth and other proponents of the dialectical theology of the early 20<sup>th</sup> century, but the view echoes throughout the Protestant Christian tradition. This view argues that Christianity (i.e., the proponent’s particular brand of Christianity, of course) is not religion, but rather relationship, encounter, with God. Other religions are religion, and even Christians can set up religions, but genuine Christianity is not religion. Robert Scharlemann has explicated the logic of this position: Since the Christian god is defined as that than which non greater can be thought, the Christian god is indefinable.<sup>11</sup> As indefinable, the Christian god does not belong to any category, species, genus that can be encountered in the world. The Christian god is “ultimate,” or “unconditioned.” Relationship with the indefinable “unconditioned” cannot be defined. “Religion” is a category of human thought that, just because it is a category, confines or limits that which it seeks to embrace within the field of conditions or the conditioned. Religion can be defined, researched, described, etc, because religion is a natural human phenomenon. Genuine Christianity, however, is not a natural human phenomenon because genuine Christianity is relationship with that which is not and cannot be defined and thus delimited.

Scholars of particular religions are not any closer than theorists of religion in general to formulating essential definitions of the particular traditions. Religions, if they exist at all, exist as traditions of conversation among voices of sects or groups that, often, share little more than words; the meanings of the words are quite often so divergent that it is difficult to see how they are part of the same tradition. There simply is no “Christianity,” “Buddhism,” “Islam,” etc. There are people who understand themselves to be Christians, Buddhists, and Muslims, but individuals and groups do not necessarily share very similar views and often share very little in common. For example, compare an 18<sup>th</sup> century Christian Universalist, a 4<sup>th</sup> century Greek Orthodox, a late Medieval Roman Catholic Thomist, a 19<sup>th</sup> century American Quaker, and a 20<sup>th</sup> century Appalachian snake handling Christian. What do they have in common except some words (Jesus, God, salvation) and, maybe some rituals (baptism, communion), which they perform and use in really quite different ways to express and motivate themselves to really quite different emotions, actions, and behaviors. Consider another important example from the history of Christianity. Fourth, fifth, and sixth century Mediterranean Christianity was torn by conflict between catholic and Arian versions of Christianity. Arians believed that ascribing divinity to Jesus violated the principle of the unity and oneness of God (monotheism). Catholic Christians believed that Jesus could not be savior without being divine. These different Christians understood “Jesus” in two really different ways. They both, however, understood themselves to be Christians. Over time, catholic Christians won the political battle and their definition of Jesus and Christianity continues to dominate public expressions of Christianity. However, viewed politically, the Arians could just as easily have won the contest for dominance, and nearly did on

---

<sup>11</sup> Robert Scharlemann,

several occasions, and there is no reason why Arianism could not make a comeback in the future and reassert its dominance.<sup>12</sup> This example should sufficiently illustrate the fact that there is no “essential” Christianity, even on a belief as central to traditional “orthodoxy” as that of the nature of Jesus. There are competing versions of Christianity. The Christian tradition consists of an ongoing intramural conversation and debate about how best to define itself. The debate includes parties which are quite closely aligned, and parties which are quite antagonistically opposed to each other.<sup>13</sup>

Generally, individuals and groups emphasize very different things in their religious practice. Some emphasize very personal and private experiences and meanings: for them, religion is about personal interiority. Others emphasize small, in-group, community experiences: religion is about living in community with others. Others emphasize large-scale social-political experiences: religion is about large-scale social, political, economic, and legal institutions and meaning. These are in fact three typical ways in which religion can be encountered in the world, and it is not very clear how they are related to each other. If religion is a private, personal matter, then its potential conflicts with science will be hardly noticeable. Small, in-group community experiences are only slightly more noticeable. Religious people who understand religion as requiring large-scale social-political experiences will have more potential conflicts with others and thus more potential conflicts with science, but not necessarily, since this type of religion can be either antagonistic to, or fully integrated with, modern critical thinking and scientific discourse. Given this theoretical and practical diversity within discussions of religion in general and particular religions and particular religious experience, it is simply not fruitful to discuss “the” general relationship between science and religion. Such conversations ignore the historical and cultural complexity of lived religious experience.

We do not intend here to articulate and defend a particular theory of religion or view of religion. We want to remind readers that there is not a single, agreed upon scholarly or theoretical definition of religion, nor is there a single, agreed upon religion of practice. We also want to remind readers that how one conceives of religion and what the specific contents are of a particular religion will determine whether that religion is good or bad, for whom, and when. We do support a broadly modern view on religion, however. Religion, religious belief, and religious ritual, whatever their type, manifestation, or content, should be subject to the same critical evaluation to which we would submit any other human phenomenon. In illustration and support of this view we cite a relatively clear example from Immanuel Kant: If a religious text, (say, for example, the Jewish and Christian book of Genesis), relates a story which seems to say that God commands God’s human follower (father Abraham) to kill his son (Isaac) in order to demonstrate his (father Abraham’s) faith in the God who commands, the story must be interpreted in such a way that what appears to be a clearly immoral divine command is not the meaning of the story. Kant insists: even if the plain (literal) meaning of the story is that God in fact made this immoral command, the religious believer **must** interpret the story in such a way

---

<sup>12</sup> For an introductory discussion, see Linda Woodhead, *An Introduction to Christianity* (Cambridge: Cambridge University Press, 2004), 45-51. For detailed discussions, see Rowan Williams, *Arius: Heresy and Tradition* (Grand Rapids: Eerdmans, 2002), and R. P. C. Hanson, *The Search for the Christian Doctrine of God: The Arian Controversy, 316-381* (Baker Academic, 2006).

<sup>13</sup> A classical exposition of the difficulty of discovering an essential interpretation of Christianity is Albert Schweitzer’s *The Quest of the Historical Jesus: A Critical Study of its Progress from Reimarus to Wrede* (Dover Publications, 2005), first published in 1906. An English translation of the text is published online at <http://www.earlychristianwritings.com/schweitzer/>.

that God **does not** make this immoral command.<sup>14</sup> Following Kant, we argue that critical thinking is the proper interpreter of any particular religious tradition. Plato's Socrates articulates a similar position in Books II-III of *The Republic*: religious discourse must be governed by ethical/critical principles.<sup>15</sup> Both for Kant and Plato's Socrates in the *Republic*, religious discourse must always be judged by the principles and standards of theoretical, practical, and aesthetic reason. The facts that different people have different gods, or no gods, and the different gods, or no gods, support and command different things at different times according to different followers, leaves human beings in the situation of having to choose among the gods and choose among the various commands of the various gods as mediated by the various followers of the various gods. The only faculty we have for choosing is our rational, critical thinking faculty, and the best critical method we have is that which we outlined above. This is not to say that reason or "science" totalizes, and renders religion obsolete, or calls for the abandonment of all religion, or is at war with religion. Remember, there is no single meaning of religion and no single meaning or essence of any particular religion, at least no one meaning or essence that has yet, or is likely to, emerge as a human consensus. It is to say that whatever we want to learn from religion, whatever dialogue we ought to have with religion, should be guided by the principles and rules of evidence and argument that constitute broad-based critical thinking.

Let us, before moving on to illustrate our view, address one last issue. This view of the relation of critical thinking to religion necessarily means that particular religions are relativised one to another, and the particular contents of particular religions are subordinated to the principles and rules of critical thinking. This general view of religion in which religion is subordinated to the principles and rules of human critical thinking capacities, is the view developed through extensive debate throughout the 16<sup>th</sup>, 17<sup>th</sup>, and 18<sup>th</sup> centuries in Europe and North America. It is the view that generated liberal and modernist wings of Judaism, Christianity and Islam, and thus the view that provoked reactionary responses known as Fundamentalism. The theoretical justifications for this view were developed over six centuries through sustained, intense, and extensive discussion and debate among serious thinkers with serious concerns about the human good, both individual and civic. The tradition to which we appeal includes Baruch Spinoza, Gotthold Ephraim Lessing, John Toland, Jean Jacques Rousseau,

---

<sup>14</sup> Immanuel Kant, *Religion Within the Limits of Reason Alone*, translated by Theodore M. Greene and Hoyt H. Hudson (New York: Harper Torchbooks, 1960): 100-105, 173-178. Kant writes, "an exposition of the revelation which has come into our possession is required, that is, a thorough-going interpretation of it in a sense agreeing with the universal practical rules of a religion of pure reason" (p. 100). Kant's clearest expression of this view is: "For the theoretical part of ecclesiastical faith cannot interest us morally if it does not conduce to the performance of all human duties as divine commands (that which constitutes the essence of all religion). Frequently this interpretation may, in the light of the text (of the revelation), appear forced—it may often really be forced; and yet if the text can possibly support it, it must be preferred to a literal interpretation which either contains nothing at all [helpful] to morality or else actually works counter to moral incentives" (Kant, 100-101). The classical alternative to Kant's view is Soren Kierkegaard's "teleological suspension of the ethical," by which Kierkegaard's pseudonym, Johannes de Silentio, explicates the "logic" of a view in which non-ethical religious concerns supersede rational ethical considerations. Our view rejects the view explicated by Kierkegaard's pseudonymous author and insists on the need to control all religious views by rational, critical ethical considerations. See Soren Kierkegaard, *Fear and Trembling/Repetition*, translated by Edna H. Hong and Howard V. Hong, (Princeton: Princeton University Press, 1983).

<sup>15</sup> Plato, *The Republic*, translated by Allan Bloom, (New York: Basic Books, 1968): 55-63ff. Socrates argues, "we must supervise the makers of tales; and if they make a fine tale, it must be approved, but if not, it must be rejected" (377b and c). "When a man in speech makes a bad representation of what gods and heroes are like, . . . they mustn't be spoken in our city" (377e – 378b). Similar views are expressed by Plato's Socrates in Plato's *Euthyphro* and by Plato's Athenian stranger in *The Laws*, see especially 810ff.



Immanuel Kant, and many other 19<sup>th</sup> and 20<sup>th</sup> century theorists, critics and scholars. Although this view clearly subordinates all religious phenomena to the principles and rules of critical thinking, it by no means denigrates the value of religious phenomena. The post-critical value of religious phenomena, however, can only be enjoyed by those who are able and willing to do the work of criticism.

At this point we wish to illustrate our view of the relation between critical thinking and religion.

## **II. Pernicious Effects of Anti-Evolution Sentiment and Policies on Human Societies in General and African American in Particular**

Earlier in this conference, Professor Harriet Luckman described how the peculiar variety of American religious fundamentalism developed on the American frontier, in isolation from higher learning, as well as church orthodoxy. In the literature of American lives, some of the most poignant memoirs are those of the frontier women. These women struggled with issues of safety, hunger, bad weather, loss of their infant children, whether they would have a roof over their heads, avoiding spousal violence, fighting for the freedom of whom to love, amongst other issues (Myres 1983.) If we could go back in time and ask these women what would be public good, they might say having enough food to eat, not having to worrying about wars with the Indians or Klan lynch mobs, not having to bury their babies who died from disease, living in a warm comfortable home, being free to decide who to love, and maybe just not being so damned tired all the time. This may seem to be a simple idea of the “good,” but evolutionary psychologists would argue that we would find these desires amongst all of the world’s people, in virtually every historical period.

The power of the scientific method is its capacity to provide resources to meet these basic human needs through the application of its theories via technology. Indeed, without this method, there wouldn’t be anywhere near this number of people alive today. Products of modern natural science, such as selective breeding to create crop varieties (all food is genetically modified, it is just by different genetic techniques), made possible the current growth of the human population. Another of the great advances of science that improved human life was the development of the germ theory of disease, which eventually led to the discovery of antibiotics. Without a proper theory of disease, one could not develop effective cures. This point is well illustrated by the impotence of the 13<sup>th</sup> century Catholic Church which was powerless before the spread of the Black Death (bubonic plague, *Erwinia pestis*.) All of the efforts of the church and all its prayers could not stem the tide of death, and in a few years greater than 1/3 of Europe’s population had died horrible deaths. The nobility and the church hierarchy survived not by supernatural means but by removing themselves to country estates away from the plague contagion. Clearly not all religious persons chose to save themselves via retreat. Some stayed and died with their parishioners. Others choose religious fanaticism. The flagellant movement grew in the late 13<sup>th</sup> century. The adherents of this cult felt that the plague was a curse from God resulting from human arrogance. They felt by reenacting the suffering of Christ that they could stem the tide of the plague. Ironically, the flagellants themselves might have been spreading the plague from city to city. This could have happened either by fleas or by human contact. Christians were not the only religion that attributed the plague to some curse from God. The Sultan of Cairo was advised by his Imams that the disease was a punishment for the rampant fornication of his

people. As a result women were prevented from making public appearances lest they incite men's temptation (Bennett and Hollister 2006.)

The point of the preceding observations is not to pillory religion, but to illustrate why by its very structure and concerns religious ideology is not capable of providing accurate information about the structure and function of the natural universe. The history of religious thought has not been guided by the principles and rules of evidence and argument that constitute a significant part of the methodology of broad-based critical thinking. Indeed, many religious groups and individuals have explicitly argued against such forms of inquiry. Such that even in the 20<sup>th</sup> century, former US Secretary of the Interior James Watt felt that no action needed to be taken to preserve natural resources. He reasoned that this was not necessary because Christ would be returning soon to establish his kingdom on Earth. In 2006, fundamentalist minister John Hagee claimed that Hurricane Katrina was God's punishment on the city of New Orleans for its sinful ways (Mother Jones 2008). Hagee would have been at home in the 14<sup>th</sup> century. He made no such pronouncement in 2008 when Hurricane Ivan devastated the gulf coast of Texas. One can only suppose that this disaster was not a curse from God because this region had more devout Christians living there. The 2008 Republican Party Vice Presidential nominee, Sarah Palin is opposed to birth control, abortion, and the teaching of evolution in the public schools.

Granted that Watt, Palin, and Hagee are extreme examples of uncritical thinking. Unfortunately, their views are widely held in the United States. These views are so popular that a major factor in John McCain's choice of Sarah Palin as a running mate was her appeal to the "Republican" base. The power of this base to influence American politics is so strong that many argue George W. Bush Jr. won the 2000 election behind the fundamentalist resistance to gay rights and marriage. This issue played a key role in southern Ohio, which was one of the key states that gave him the required electoral votes to win. Others point out that his ability to win this election was influenced by the political agenda of another group of religious extremists (the Wahabi Muslims) through the wealth of the Saudi royal family (Unger 2004.) What is clear is that in the United States, inordinate political power is being wielded by self-proclaimed "Biblical literalist" Christian fundamentalists. They are using this political power in an attempt to set the nation's social and cultural agenda. Indeed if the Palin's amongst America's political leaders were to succeed in this task, entire areas of scientific research might be put at risk.

Ironically, this isn't the time for impeding the power of science. The United States and the rest of the industrialized world is now in the midst of severe financial crisis. The financial crisis for the US is partially caused by its dependence on imported oil. This dependence is in turn part of a greater danger; an energy economy that relies on the burning of fossil fuels. Science has already explained why this is problematic. At the present rate of global consumption, fossil fuels may be depleted within a few hundred years. In addition, the burning of fossil fuels adds to the CO<sub>2</sub> content of the Earth's atmosphere. This and other greenhouse gases have been demonstrated to playing a major role in anthropogenic climate change. Polar scientists have already shown that the polar ice caps are now open during summer. Sea levels are rising in the Pacific. Higher average temperatures are allowing the expansion of the habitat range for disease vectors. Agriculture areas that were once receiving adequate rainfall are experiencing shifting patterns of precipitation. To address these issues the entire arsenal of modern science will be required. The problem, however is that in the United States, increasing numbers of its citizens are not prepared to critically think through the mind-boggling possibilities of the present conjuncture. This results for many Americans due to the growing influence of religious

fundamentalism. Thus, this version of uncritical religious discourse is already causing harm. Indeed its spread may lead to irreversible catastrophe in the same way the flagellants may have hastened the spread of the Bubonic plague in 14<sup>th</sup> century Europe.

### **Critical Thinking About Religion, Biology , and Race**

American society is unique. It is one of the few examples of a nation whose indigenous population was replaced in mass by immigrants from another continent. This also happened in Canada and Australia. However, Canada and Australia did not experience the amount of racial slavery that was integral to the growth of America as a world power. This process was also different for countries such as the Republic of South Africa since here a European derived minority held political power for a time but this minority never became more numerous than the indigenous population. At the center of the transition of the process by which America transitioned from a continent numerically dominated by its indigenous inhabitants to one numerically, socially, and culturally dominated by European descendents were notions of religion, biology, and race. Few scholars would dispute the previous claim. However, what is less acceptable to them, and almost taboo for the general public is the claim that racial and religious ideology still are playing major roles in the social subordination of specific non-European derived populations within the modern nation. In the following sections we shall illustrate how non-critically examined religious belief and racial ideology are still causing significant harm to the well-being of African Americans.

The African American saga began in Jamestown in 1619. This was one year before the Pilgrims arrived in what they would name New England. They would not have survived the first winter if not for a man named Sqaunto of the Wampanoag nation. The American holiday of Thanksgiving commemorates the early friendly relations between these people and the Pilgrims. These relations deteriorated quickly. The cultures and customs of these different societies were too incompatible. The English viewed the Amerindian nations as savages, whose actions served the devil. By 1622 violence against the Indians was becoming more common. By 1630 a significant Puritan colony was established in Massachusetts. The Puritans mission in America was explicitly religious. They wanted to establish a civilization that would be a model for what they saw as a decadent and immoral England. This mission meant that they wanted land and wanting land put them in immediate conflict with the local Amerindians for resources (Gillon 2006.) By 1638, the Puritan colony had grown to 11,000 persons. They justified the seizure of Amerindian land as part of their covenant with the Christian God. Conversely, Amerindian religious thought venerated the land, but to them land, animals, and plants were all spiritual entities. Thus the action of the English settlers who were clearing forests, trapping and hunting wildlife at unprecedented rates, planting agricultural fields, and attempting to build permanent cities were sacrilegious. There could not have been an easy resolution to these differences in religious practice, especially when at least one side felt that the other was demonic and primitive. This is a glaring example of the problem of uncritically practiced religion. European Christians could not bring themselves to understand that their religious revelations were in no way “superior” to those of the Amerindians. Instead they “proved” the superiority of their God by the brutal massacre and subjugation of the people who had originally attempted to live with them peacefully (Mystic River massacre 1637, the Pequot War 1638, and the resolution to these events came with the end of King Phillip’s War in 1676.)

The treatment of African slaves by the English was just as bad. However, while the American Indians had the means to maintain warfare against the European immigrants to

America until the 1870's, this was not really true of the Africans. As slaves, the African descended persons were at a severe disadvantage from the onset. Initially, African and European servants were treated similarly. However, by the beginning of the 18<sup>th</sup> century all of the slaveholding states had enacted legislation that differentiated the African slave from the European indentured servant (Graves 2005a). African resistance to slavery was uneven and consisted primarily of running away. There were a few notable slave rebellions but all ended with larger mortality for the slaves compared to the masters. Initially Africans attempted to maintain their cultural integrity, but with so many tribes interspersed together and with the power of the slave master to physically torture those who resisted indoctrination, the indigenous African cultures amongst the slaves had all but disappeared by the 3<sup>rd</sup> generation of slaves (ironically the original Angolans landed in Jamestown in 1619 had already been converted to Christianity, Hine, Hine, and Harold 2006.)

These examples illustrate why religion, race, and biology played a foundational role in the forming of the United States. The nation's founding leaders were primarily Protestants of Western European descent. They differed from those they subordinated by their religious beliefs (Protestantism versus Amerindian Shamanism and hybridized West African Shamanism and Christianity), as well as their physical appearance (Northwestern European features versus Amerindian (similar to both E. Asian and E. European) and Sub-Saharan African. These differences combined to develop the socially constructed race theories which until the mid-19<sup>th</sup> century were predominantly directed by religious as opposed to scientific ideology (Graves 2005a, pp. 37-51.) What is less appreciated is how the religious aspects of these socially constructed race theories still dominate the way the majority of Americans think about race.

### **Race and Creationism**

The United States of America is also unique amongst modern industrialized nations regarding its orientation toward scientific explanations of human origins. The United States finished 33<sup>rd</sup> of 34 industrialized nations in a survey of public acceptance of evolution (Miller, Scott, and Okamoto 2005.) There is still a great deal of resistance to the scientific fact that modern humans are descended from pre-existing forms of life. In June 2007, the Gallup Poll Organization queried Americans on their views on the origin and development of life on Earth. Particularly relevant to this paper are the results from the question that addressed whether humans were the result of a special act of creation by a supreme, supernatural being (God): *Creationism, that is, the idea that God created human beings pretty much in their present form at one time within the last 10,000 years* is definitely true, probably true, probably false, definitely false, no opinion. Of those surveyed, 39% felt that this was definitely true, and 27% felt that it was probably true. Conversely only 15% felt that this claim was definitely false, 39% report belief in God-guided evolution, while only 9% report belief in evolution without God. These numbers have remained stable since 1982 when Gallup first asked these questions.

Sociological research indicates that certain education, class, and geographic factors correlate with adherence to creationist views in the United States. It is also likely that acceptance of this view is strongly influenced by the ethnicity/socially-constructed race of the respondent. African Americans, who generally belong to more fundamentalist/Biblical literalist Christian denominations, would be expected to show an even higher response in the definitely true category. For example, 85% of African Americans report themselves as Christian, with membership in Protestant denominations at 78% (15% evangelical, 4% mainline, and 59% historically black churches.) Only 5% of African Americans report as Catholics, 1% as Jehovah

Witnesses, 1.5% as Mormons and other Christians, PEW Forum 2008.) If we assumed that all the Catholics followed the Papal edict concerning evolution, then based on these figures, we should expect less than 10% of African Americans to have no religious objection to evolution (including the 1.5% of African Americans who describe themselves as atheists and agnostics.) This percentage would be the lowest for any American ethnic group except for American Indians (lower than European Americans, Hispanics, and Asian Americans.)

There are logical consequences for American views about race that follow from the belief that: “*God created human beings pretty much in their present form at one time within the last 10,000 years.*” This would imply that God created the races of human beings as well. This is not a new idea. European and American naturalists of the 18<sup>th</sup> century all operated under the assumption that human racial variation was created by the Christian God. They further reasoned that since all acts of creation had significance, the differences between the races also had significance. For these naturalists, this generally meant that the differences of the others were signs of inferiority relative to the European norm. Europeans stood above all other races on the Platonic scale of nature relative to God’s perfection. Louis Agassiz (1807 – 1873), a contemporary of Charles Darwin, explained that human races resulted from schemes of creation in which particular animals and plants were designed to fit specific physical environments (zones of creation, Gould 1981.) Agassiz was a polygenist. These naturalists thought that there had been separate creations of human species. This notion follows the idea that God created pre-Adamite races. The descendents of the pre-Adamite races thus did not share the covenant that God established with Abraham. Graves 2005a demonstrates that the polygenist theory of human origins was the most popular naturalist view of the 19<sup>th</sup> century in both the United States and United Kingdom. It also had a considerable number of religious adherents in the form of the Pre-Adamite races (Harris, 1867; Causland 1868; Moore 1868; Winchell 1890.) The idea that the races of man were meant to be separate also had theological traction in the 20<sup>th</sup> century. Throughout the Civil Rights movement in the United States, the Southern Christian Leadership Conference (which was African American) cited Biblical passages that supported the idea that all Christians were united spiritually in the body of Christ. Thus it followed from their argument that segregation was not only immoral but sinful. To this the segregationists replied that the unity of the church was spiritual not physical. God had created physical differences between the races and had placed them in different regions of the world. From this they implied that God meant to keep the races separate and they relied on Biblical citations such as Deuteronomy 32:8, “*When the Most High gave the nations their inheritance, when he divided all mankind, he set up boundaries for the peoples according to the number of sons of Israel*”, and Paul in Acts 17:26, “*From one man he made every nation of men, that they should inhabit the whole Earth; and he determined the times set for them and the exact places where they should live.*” They claimed that these passages supported the contention that God wanted the different types of people to be separate (Dailey 2004.) It is significant that late in the 20<sup>th</sup> century, segregationist attitudes toward public schooling were still significantly correlated with the belief that God had created separate and different abilities for the races. European Americans who favored segregation of African Americans in Tennessee believed that God had created African Americans with inferior mental ability (Pride and May 1999.)

The religious idea that humans may be the descendents of more than one creation has not completely subsided in American life. At least one book was written in 2007 that attempted to resuscitate the Pre-Adamite races (Mayer 2007.) Despite the popularity of polygenism in the 19<sup>th</sup> century, the most commonly held view for the origin of human races in America was monogenist.

The monogenist view accepts only one Adam, but proposes that the difference races of men are descended from Noah. The development of the races follows from the curse that Noah brought against his son Ham and his descendents (Genesis 9:21-25.) This story tells that Noah and his three sons, Shem, Japheth, and Ham along with their wives were taken aboard the ark. God brings the flood to destroy all flesh. During the time aboard the ark, Ham ridicules his father's nakedness, while Shem and Japheth avert their eyes and cover their father. Noah responds by cursing Ham's son to be "the servant of servants." When the flood subsides, the people and animals depart the ark. Modern fundamentalist Christians claim that Shem gave rise to the nation of Israel, Japheth to the European and Asian races, and Ham to the African races. Henry Morris, director of the Creation Research Institute, claimed that the Hamitic races are inherently limited by consequences of Noah's curse. He claims that even the early inventions of the Hamitic peoples were taken over by the Japhethites (Europeans) and that the Hamites were enslaved by the latter.

There are a number of problems with Morris's argument. First, all of the world's populations have been enslaved by groups from other population at various times. Thus it is impossible to single out the slavery against Africans as the episode of slavery that resulted from the curse of Ham. Secondly, the idea that Africans were Hamitic is a modern idea. Braude (1997) demonstrates that there is no consensus on the identity of the Noahic lineages in medieval Europe. The midrashic and Talmudic stories of Ham being smitten on his skin are vague and unclear and do not mention any skin color change. The 13<sup>th</sup> century German scholar Eike Von Repgow argued that Ham's sons settled in Africa to refute the claim that these sons had given rise to slaves and serfs. He argued that it was Europeans who were slaves and serfs. This again illustrates the weakness of religious narrative with regard to explaining natural phenomena. Various Christian and Jewish traditions in different time periods interpreted the curse of Ham with respect to the circumstances of their own time. There is no rule-driven methodology that can dispute any of the specific claims within the context of religious discourse. Saying that the Hamites settled in Europe is just as valid as saying that they settled in Africa.

Given that the majority of Christians in the United States adhere to some form of fundamentalist Protestantism it is safe to say that the majority of modern American thoughts about the meaning and significance of human variation can be located within this world view. The situation is made worse by the fact that the majority of American college students have little education regarding human evolution (Graves 2002.) For example, a 1992 poll that found that significant number of college students believed that the color a person's skin depended on whether God favored or punished their ancestors. Researchers at Arizona State University found that 18.4% of their undergraduates agreed with or were not sure that dark skin resulted from God's curse (Lawson and Worsnop 1992.) At that same institution in 2001, 25% of my students believed that human races began at "the beginning of time" (Graves 2002.) In 2006, 15% of students polled at North Carolina A&T State University believed that humans and dinosaurs co-existed. These figures were similar to a survey of California freshman conducted in 2000 (Graves 2002.) In a 2008 survey at NCATSU asking when modern humans first appeared 28.7% believed this claim. In that same poll, only 11.6% answered that modern humans evolved within the last 200,000 ybp.

### **Testing creationism's claims concerning race**

The majority of African Americans belong to Protestant denominations that are fundamentalist. The National Baptist Convention for example claims that every bit of the Bible is factually true. Ironically, unlike the Southern Baptist Convention (which is predominantly European American and was founded on segregationist principles), the NBC hasn't invested a great deal of energy in the Evolution/Creation debate. This may be in part, because the NBC has always been more concerned with issues of social justice. Despite its relatively progressive stance compared to the SBC, it is argued here that the fundamentalism of the NBC is causing harm to the African American community. Specifically its fundamentalist views make it more difficult to attract talented African American students into careers in science (specifically those disciplines in science that may contradict fundamentalist doctrine, e.g. Archaeology, Anthropology, Human Genetics, or Evolutionary Biology.)

When we examine the claims of fundamentalist Christianity versus those of evolutionary biology with regard to human genetic variation and the concept of race the former fails miserably to explain what we observe. The fundamentalist narrative has logic implications. It predicts that modern humans are ~10,000 years old and that the original humans had physical characteristics similar to modern day Middle Easterners. In this vein, Biblical fundamentalism is no different from any of the other religious narratives of creation. For example, American Indian creation narratives claim that their great spirit created their people on their ancestral tribal land. Modern American Indian traditionalists vehemently reject the notion that they are derived from or share ancestry with any other human populations (especially Africans.) For example, some American Indians of the Northwest claimed that they should have sovereignty over the remains of the Kennewick man fossil under the assumption that because the bones were found in territory that their tribe once inhabited, that the remains had to be one of their tribal ancestors (Tall Bear 2003.). For the American Indians tribes, the anatomical or genetic evidence concerning Kennewick man was irrelevant. They argued that neither of these could be used to determine the cultural identity of the individual in question. They claimed this despite the fact that the Kennewick fossil had anatomical features there were significantly different from modern Amerindians (Swedlund and Anderson 1999; Chatters 2000.). Eight prominent anthropologists disputed the claim of the American Indians by arguing that there was no evidence supporting the claim that these remains had cultural continuity with those of modern American Indians. This is a clear example where the methodologies of religious and scientific thinking were in conflict. For the American Indians involved, their rejection of the Bering Strait theory is primarily due to its conflict with their traditional religious beliefs and oral histories. In addition, they are suspicious of how the scientific claims may be used to weaken their land rights under treaty with the United States government (and certainly given the US government history of breaking treaties this is a legitimate concern. Tall Bear 2003.)

In this instance, the Amerindian religious objections are no different from those of Biblical fundamentalists. Both groups reject the scientific evidence primarily on the grounds that it contradicts their religious story of human origins. This is a common feature of religious creation narratives, all are constructed to explain the origin of the people who believe in the religion or deity. Thus, Kenyan creation narratives speak of how the Gods created them in their home land, as do Japanese narratives speak of how the Gods created humans in Japan. The scientific evidence only supports those creation narratives that claim that humans first originated in East Africa.

It may seem that due to the religious/supernatural character of these narratives that they cannot be subjected to scientific test. However, most of the fundamentalists do not dispute that

DNA is the genetic code of life. What they dispute is that DNA as the genetic code can evolve to found new species. Many creationists will accept microevolutionary changes within species as legitimate. The concession that microevolutionary changes occur within species results from the fact that these changes have been observed in historical time. There are also many genetic mechanisms that have been observed and by themselves are not required to have resulted from an evolutionary mechanism. For example, crossing over is consistently observed during meiosis (gametogenesis.) This results because portions of the DNA that have high sequence similarity line up with each other during meiosis and often exchange pieces. Evolutionary biologists argue that crossing over is an important source of new variation for natural selection to operate on, however the fact that crossing over exists is not a requirement for evolution and crossing over could exist without resulting from an evolutionary process.

One of the things that results from crossing over is that genetic linkage groups (genes that are inherited together due to close proximity on a chromosome) are disrupted over time. This has been observed in laboratory populations and in domesticated mammals (Clegg et al. 1980; Betancourt and Presgraves 1980; Amaral et al. 2008). It has also been observed that newer populations have larger linkage groups, and that due to crossing over, the average size of these groups gets smaller through time. Thus we can “age” populations by the average size of their linkage groups. This provides us with a way to estimate the age of human populations that is not necessarily linked to a macroevolutionary process. Studies that examine the size of linkage groups have been accomplished in modern humans. They all concur that sub-Saharan Africans have the smallest linkage groups on average, followed by Middle Eastern populations, Europeans = East Asians = Pacific Islanders, followed by American Indians. This result vitiates the fundamentalist Biblical claim that Middle Eastern populations were created first or that modern Africans are descended from Middle Easterners. The evidence shows that it was the other way around (if one is a monogenist.) This result doesn’t invalidate the Amerindian creation narratives because they don’t assume that there was only one God. Thus, the African and European Gods could have created these populations at different times. Table 1 states a number of Christian fundamentalist claims concerning human origins. It also states claims that follow logically from polygenist as well as evolutionary theory. Table 2 reports what modern genetics and fossil evidence reveals concerning human diversity. Table 2 suggests that all of the monogenist claims concerning human diversity are falsified, in the case of polygeny 2/5 predictions are supported, and finally for evolutionary theory 4/4 are supported with 1 claim not relevant since evolutionary theory makes no specific prediction for the phenomenon. From these results we would have to logically conclude that there is no physical evidence that supports monogenist creationist claims concerning the origin of humans. Thus if one wishes to adhere to special creationism while insisting that there be physical evidence for it, you would have to become a polygenist. Of course, the body of physical evidence also suggests that polygenism is false and supports that modern human evolved with their place origin located in Sub-Saharan Africa.

### **What are the consequences of getting human diversity wrong?**

Graves 2005a points out that Charles Darwin was actually one of first naturalists to dispute the claim of the polygenists that there were separate species of humans. Darwin’s thinking also contradicted the core claim of the monogenists. For both groups of creationists, human variation had significance because it resulted from an act of divide creation. For the European mind of the 18 – 20<sup>th</sup> century, that significance was always that the non-European was created inferior and



thus was divinely ordained to fulfill a subservient role in Christian society. Japanese creation myths present them as “pure-blood people” not descended from or related to others. Inherent in this notion is that they are superior to others (Graves 2005b). Darwin on the other hand stated the variations we observed in modern humans could not be of much significance because if they were natural selection would have eliminated the variations generations ago. He also realized that his contention that all humans shared common ancestry and also shared common ancestry with other mammals would be one of his most despised conclusions (both by religious practitioners and professional naturalists, Graves 2005a.) Darwin also reasoned that the origin of modern humans had to be in Sub-Saharan Africa because the closest relatives to modern humans (the apes) resided there. This claim has been now validated both by fossil and genetic evidence (Boyd and Silk 2003.)

There are real material consequences to getting the fact and the mechanism of human genetic relatedness wrong. The primary difficulty with anti-evolutionary explanations of human genetic diversity is that they fail to make any useful predictions about human biology. For example, the ubiquitous phenomenon of human aging when unexplained until the work of theoretical and experimental work of evolutionary biologists beginning in the 1940’s (Rose 2005.) We wouldn’t be able to understand disease without the power of evolutionary theory (Neese and Williams 1996; Ewald 2000.) Nor would we be able to comprehend most of human behavior, including sexual behavior without evolution (Sober and Sloan-Wilson 1998; Miller 2000; Roughgarden 2004; Oakley 2008.) One of the most pernicious modern fallacies can be located in the attempt to resuscitate “racial medicine” (Graves and Rose 2006.) Another example of this in biomedical research arises from the historical failure to properly sample human genetic diversity. In the absence of accurate data, conclusions are being drawn that reify notions of 19<sup>th</sup> century racial classification (Graves 2005c.) There have also been historical fallacies that have resulted in great harm, such as the social-Darwinism (Spencerism) and eugenics.

Creationist errors concerning human genetic diversity are even more destructive. Behind all of these is the hidden and sometimes explicit idea that God favors only a particular group of people (e.g. God’s chosen people.) Modern ethnic cleansing is not justified primarily by science, as opposed to religious justifications that exploit ethnic differences. For example, Nazi race theory was not really located in science, but was motivated by the religion of Aryanism (Poole and Poole 1976; Graves 2005a.) The Nazi call for the extermination of European Jewry was also rooted in a deeper Christian anti-Semitism which can be located back into the Middle Ages (Gossett 1963.) In the United States creationist/Biblical literalists have been historically associated with racist terror organizations (such as the Ku Klux Klan.) William Jennings Bryan (who argued the State of Tennessee case in Scopes) was sympathetic to the Klan. He endorsed Klansmen in elections and spoke against an amendment denouncing the Klan at the 1924 Democratic Party convention. Bryan also received political support from the Klan. In 1925 the Ku Klux Klan that was the first organization to urge that creationism and evolution be given equal time in public schools. When Bryan died five days after the Scopes Trial, the Klan burned 3 crosses in his honor (de Camp 1968; Feldman 1999; Alexander 1965; Ashby 1987; Chalmers 1965, Rice 1962.) Throughout the history of the Biblical literalist movement over 40,000 fundamentalist preachers have joined the Klan (McIver 1994.) Notables amongst well known fundamentalists with overtly white supremacist ideology were William Bell Riley (World Christian Fundamentals Association), Billy Sunday, Bob Jones Sr., and J. Frank Norris (Moore 2002.) Latter in the 20th century as most Christian denominations denounced the Klan, the Southern Baptists were silent on this issue. The SBC had originally been formed in 1845 as the

pro-slavery Baptist church (Rosenberg 1989.) Throughout its history the SBC was opposed to integration and anti-racism, denouncing Darwinism as “a soul-destroying, Bible destroying, and God dishonoring theory.” The legacy of Bob Jones, Sr. was evident at Bob Jones University throughout the 20th century (located in Greenville, South Carolina.) This institution did not strike down its policy against interracial dating until 2000. The policy was based on the idea that interracial dating was “playing into the hands of the Antichrist by defying God’s will regarding God-made differences among the races” (Hebel and Schmidt 2000.) This review of the close association between Biblical literalists, creationists, and white supremacy explains why African Americans haven’t actively participated in the anti-evolution movement. Even if they share similar ideology on the infallibility of the Biblical narrative, they are diametrically opposed to this movement’s social base.

### **Failed Social Policies Differentially Impact African Americans**

One of the most important tests of any worldview is do they explain reality and if so what prescriptions they suggest for human activity. Prior to the germ theory of disease, it was a common belief amongst European Christians that many illnesses were caused by demonic possession. If the former theory is true than disease can be cured by medicine and if the latter disease is true than you need to consult a priest for an exorcism. In the present day, few religious people subscribe to the demonic possession theory of disease. Yet and still, religious explanations of important social issues still exist and in the United States these have traction with regard to strongly influencing public policy. For example, the majority of Christian fundamentalists see homosexuality as a deviant behavior that is a sin against God. They claim that they love the sinners, but despise their sin. Due to the influence of this group on American politics, legal protections against anti-gay discrimination are weak. The problem with this thinking is that increasing evidence demonstrates the homosexuality is biologically based (resulting from genetic, environmental, developmental, and chance factors, Hamer 1995; Roughgarden 2004; Cianni, Cemelli, and Zanzotto 2008.) This realism has caused at least some Christians to re-evaluate their views on homosexuality. If this behavior is genetic and therefore is not the result of a choice to disobey God’s law, then it cannot be considered sinful. It should be remembered here that the creationist believes that everything that occurs within humans is the result of God’s design. This example graphically illustrates how two different world views describe reality and in turn what those views would prescribe for human social action.

There are several examples of how fundamentalist/creationist belief harms African Americans who adhere to its tenets. Certainly, in the above case, the religion fundamentalism of African Americans had led them to disproportionately shun homosexual members of the African American community (Stokes and Peterson 1998; Fullilove and Fullilove 1999; Battle and Bennett 2000.) The harm that has resulted has included higher rates of suicide amongst these homosexuals as well as them engaging in more risky sexual behavior thus infecting non-homosexuals as well.

In addition, efforts to stem the tide of HIV infection as well as teen pregnancy rates suffer from fundamentalist ideology. For example, two of the most pressing problems in the African American community today are the HIV epidemic, the increasing percentage of teen pregnancies and the disproportionate rate of underweight babies. The age of mother is an important variable influencing low birth weight (as is poverty.) Evangelical and literalists in African American community argued for and have succeeded in implementing abstinence only programs to deal

with teen pregnancy. For example, 78% of African Americans belong to fundamentalist congregations, and this percentage may have been even higher in the past. The abstinence theme is undoubtedly heard by millions of African American teens, far more than heard by European American teens whose churches aren't as literalist. Yet the data clearly show that HIV and teen pregnancy rates are much higher in African Americans. The African American rate is twice the European American rate. The National Center for Health Statistics reported that the birth rate rose by 3 percent between 2005 and 2006 among 15- to 19-year-old females, after plummeting 34 percent between 1991 and 2005. There is also a nine times higher percentage of Chlamydia and HIV infection in African Americans despite the fact that this group is far more likely to hear abstinence preached in their church. These increases occurred despite the fact that in this period, abstinence-only sex-education programs, received about \$176 million a year in federal funding. Despite their gross failure to stem the tide of teen age pregnancy or sexually transmitted diseases, the proponents of abstinence education continue to defend the programs, and instead blamed the increases on the rise on the ineffectiveness of conventional sexual education programs that focus on condom use and other contraceptives, as well as the pervasive depiction of sexuality in the culture (Stein 2007.)

Evolutionary biologists would approach this problem entirely differently. Under the evolutionary paradigm the core behavioral activity of all species is reproduction and humans are not excluded from this. For this reason, abstinence programs are fool's errands. Human adolescents face a rush of hormones that are preparing them to engage in reproductive behavior. Abstinence only programs assume that by "will" alone these young people will be able to control the urges to engage in sexual activity. Evolutionary theory would suggest that a significant number of adolescents will engage in sexual activity and for that reason it is best to give them sex, safe-sex, contraceptive, and relationship counseling.

### **Creationist ideology causes harm by limiting desire to pursue scientific careers**

Reason suggests that students who are hostile to the methodologies of science should shun science careers. Brazelton et al. 1999 has demonstrated a negative relationship between student religiosity and likelihood to choose science as a career. This general issue is discussed in Harrold and Eve 1995. Graves and Leigh 1994 discussed this specifically for African American students. Mazur 2005 repeats the finding of religious fundamentalism and resistance to evolution.

These studies are suggestive however. In that none of them have really examined enough students to establish a differential impact of African American religiosity, particularly fundamentalism on the choice of specific science careers. For example, North Carolina A&T State University produces substantial numbers of African American students with degrees in Engineering, but virtually none who pursue degrees in biology with an emphasis in evolution. Clearly there is a need for additional studies with substantial sample sizes and conducted in a variety of academic settings to evaluate the influence of creationist ideology with regard to science careers.

### **Conclusion: Critical Thinking in Religion and Science for the Public Good**

This paper has defined "science" in differentiation from "religion." Science is the set of critical principles and rules for evaluating and testing data and arguments about the meaning of data.

We conclude that these principles and rules are appropriate for investigating all areas of experience, including natural, social, and aesthetic phenomena. In our view “science” is best pursued via “critical thinking.” It was also our purpose to illustrate the wide diversity of religious traditions and the wide diversity of scholarly interpretations of religion. We contend that the extent religion and science are compatible depends centrally on how both religion and science are defined and understood. To make this point, we examined the impact of Christian fundamentalism upon a particular population, African Americans. We demonstrated that in this context, religion and science act in ways that make them necessarily antagonistic to one another. Alternatively we suggest that it is entirely possible to develop dialogs between science and religion that make them compatible, complementary, or even identical. For this to occur science and religion require careful definitions and accurate presentations of their historical and conceptual diversity. We believe that this can only occur for those religious practitioners who are willing to view religion as also governed by the principles and rules of critical thinking. Finally, the case of decidedly negative impact of special creationist ideology upon African Americans suggests that American society has much to gain by bringing such a reasoned dialog into the common practice of the majority of its citizens.

<b>Table 1: Predictions of Biblical Literalist Creationist and Evolutionary Scenarios on Human Diversity Claim</b>	<b>Monogeny</b>	<b>Polygeny</b>	<b>Evolutionary</b>
Origin of humans: Location	Middle East (ME).	Pre-Adamite races could have originated anywhere, but Adamite races in the Middle East.	East Africa
Origin of humans: timeline	Within the last 10,000 years.	Pre-Adamite races could have originated at anytime, but Adamite races within the last 10,000 years.	Within the last 200,000 – 150,000 ybp.
Genetic Diversity	More should exist in the ME.	Pre-Adamite races should have more genetic diversity than the Adamite races.	Greatest genetic diversity should be in Africa, less as you move away from Africa, small populations should have the least.
Skin and eye color.	Lighter skin should have appeared first, darker skin after Noah. All eye colors should have appeared at the same time.	Darker skins appear first, lighter skins of Adamites should appear later.	Darker skin appears first since humans evolved in the tropics. Lighter skins evolve after humans migrate to northern climates (~ 70,000 – 55,000 ybp.) Brown before blue eyes.
Deleterious genes	Descendents of Ham should have more deleterious genes (Henry Morris).	Pre-Adamites should have more defective genes.	No explicit prediction.
<b>Table 2: Results of Genetic Studies on Human Diversity Claim</b>	<b>Monogeny</b>	<b>Polygeny</b>	<b>Evolutionary</b>
Origin of humans: Location	No, East Africa.	No, all humans ancestry traces to Africa.	Yes, East Africa.
Origin of humans: timeline.	No, genomic and individual genes results suggest 200,00 to 150,000 ybp.	No all humans have genes that fit the 200,000 to 150,000 ybp results.	Yes, Africa 200,00 – 150,000 ybp., ME, Europe, Asia – 100,000 – 35,000 ybp, Americas ~ 35,000 ybp.
Genetic diversity	No, more in Sub-Saharan Africa.	Yes, Sub-Saharan Africans > ME.	Yes, greatest genetic diversity in Africa, less in Europe and Asia.
Skin and eye color	No, darker color genes more ancient.	Yes, darker color skins more ancient.	Yes, darker skin more ancient, light pigmentation recent, e.g. blue eye allele is only ~ 6,000 ybp.
Deleterious genes	No, Europeans have more deleterious than Africans**.	No, Europeans have more deleterious genes.	No explicit prediction, although this is predicted by genetic drift an evolutionary mechanism.

\*Fossils of anatomically modern humans are first found in sub-Saharan Africa in this time frame, they are not found outside of this region until around 100,000 ybp.

\*\*Lohmueller et al. 2008; Barreiro et al. 2008.

## Literature Cited

- Akey, J.M. Zhang, G., Zhang K., Jin L., and Shriver, M., "Interrogating a High-Density SNP Map for Signatures of Natural Selection," *Genome Research* 12:1805 – 1814, 2002.
- Alexander, C.C., *The Ku Klux Klan in the Southwest*, (Lexington, KY: University of Kentucky Press, 1965.
- Amaral, A.J., Megens, H.J., Crooijmans, R.P., Heuven, H.C., and Groenen, M.A., Linkage disequilibrium decay and haplotype block structure in the pig, *Genetics* 179 (1): 569-79, 2008.
- American Association of Anthropologists, Statement on Race, May 17, 1998; available online at: <http://www.aaanet.org/stmts/racepp.htm>.
- Ashby, L., William Jennings Bryan: Champion for Democracy, (Boston, MA: Twayne Publishers.)
- Atran, Scott, *In Gods We Trust: The Evolutionary Landscape of Religion*, Oxford: Oxford University Press, 2002.
- Barreiro, L.B., Laval, G., Quach, H., Patin, E., and Quintara-Murci, L., Natural selection has driven population differentiation in modern humans, *Nature Genetics*, advanced online publication, February 3, 2008.
- Barrett, Justin L., *Why Would Anyone Believe in God?*, Walnut Creek, CA: Altamira Press, 2004.
- Battle, J. and Bennett, M., Research on Lesbian and Gay Populations in the African American Community: What Have We Learned?, Perspectives pp. 35 – 46., 2000.
- Berger, Peter, *The Sacred Canopy: Elements of a Sociological Theory of Religion* (New York: Random House), 1969, 1990.
- Betancourt, A.J., and Presgraves, D.C., Linkage limits the power of natural selection in *Drosophila melanogaster*, *Proceedings of the National Academy of Sciences, USA* 99: 13616 – 13620, 2002.
- Bowcock, A.M., Kidd, J.R., Mountain, J.L., Hebert, J.M., Carotenuto, L., Kidd, K.K., and Cavalli-Sforza, L.L., "Drift, admixture, and selection in human evolution: A study with DNA polymorphisms," *Proc. Natl. Acad. Sci.* 88: 839–843, 1991.
- Boyd, R. and Silk, J.B., *How Humans Evolved 3<sup>rd</sup> Ed.*, (New York, NY: Norton), 2003.
- Boyer, Pascal, *Religion Explained: The Evolutionary Origins of Religious Thought*, New York: Basic Books, 2001.
- Braude, B., The sons of Noah and the construction of ethnic and geographical identities in the medieval and early modern periods, *The William and Mary Quarterly*, Third Series, Vol. 54, No. 1, pp. 103-142, 1997.
- Brace, C.L., *"Race" Is a Four-Letter Word: The Genesis of the Concept*, (New York, NY: Oxford University Press), 2005.
- Brazelton, E.W., Frandsen, J.C., Mckown, D.B., Brown, C.D.; Interaction of Religion and Science: Development of a Questionnaire and the Results of It's Administration to Undergraduates, *College Student Journal*, Vol. 33, 1999.
- Broome, S.W., Resolution shines a light on Darwin's racism, *Times - Picayune - New Orleans, La.*, April 28, 2001.
- Cann, R., Brown, W., and Wilson A.C., Polymorphic sites and the mechanism of evolution in human mitochondrial DNA, *Genetics* 106: 479-99; 1984.
- Cann, R., Stoneking, M., and Wilson A.C., Mitochondrial DNA and human evolution, *Nature* 325:31-36, 1987.
- Causland, D.M., Adam and the Adamite, or the Harmony Between Scripture and Ethnology, (London: Richard Bentley), 1868.
- Cavalli-Sforza, L.L., Menozzi, P. and Piazza, A., *The History and Geography of Human Genes* (Princeton, N.J.: Princeton University Press), 1994.
- Chalmers, D.M., *Hooded Americanism: The History of the Ku Klux Klan*, (New York, NY: Franklin Watts), 1965.
- Chatters, J., The recovery and first analysis of an early Holocene human skeleton from Kennewick, Washington, *American Antiquity* 65(2), pp. 291-316, 2000.
- Ciani, A.C., Cermelli, P., Zanzotto, P., Sexually Antagonistic Selection in Human Male Homosexuality, *PLoS ONE* 3(6): e2282. Clegg, M.T., Kidwell, J.F., and Horch, C.R., Dynamics of correlated genetic systems V. Rates of decay of linkage disequilibria in experimental populations of *Drosophila melanogaster*, *Genetics* 94: 217-234.
- Corn, D. "McCain's Spiritual Guide: Destroy Islam," *Mother Jones Magazine*, March 12, 2008, [http://www.motherjones.com/washington\\_dispatch/2008/03/john-mccain-rod-parsley-spiritual-guide.html](http://www.motherjones.com/washington_dispatch/2008/03/john-mccain-rod-parsley-spiritual-guide.html).
- Dailey, J., Sex, segregation, and the sacred after Brown, *The Journal of American History*, June 2004, pp. 119 – 144.
- Darwin, C., *The Voyage of the Beagle: Charles Darwin's Journal of Researches* (1839), edited by J. Brown and M. Neve (New York, NY: Penguin Classics), 1989.
- Darwin, C., *On the Origin of Species: By means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life*, (London: J. Murray), 1859.
- Darwin, C., *The Descent of Man and Selection in Relation to Sex* (London: J. Murray), 1871.

- De Camp, L.S., *The Great Monkey Trial*, (Garden City, NJ: Doubleday), 1968.
- Desmond, A. and Moore, J., *Darwin*, (London: Michael Joseph), 1991.
- Du Bois, W.E.B., "The Conservation of Races", 1897, in *W.E.B.: A Reader*, ed. A. Paschal, (New York, NY: Collier/MacMillan), 1971.
- Eiseley, L., *Darwin's Century: Evolution and the Men Who Discovered It*, (New York, NY: Double Day/Anchor Books), 1961.
- Ellwanger, P., What has evolution done for the black man?, on Origins: Creation Evolution & Some of their Connections, <http://hometown.aol.com/thomasaquinas87/origins/racism/black.pdf>, 2008.
- Ewald, P., *Plague Time: How Stealth Infections Cause Cancers, Heart Disease, and Other Deadly Ailments*, (New York: The Free Press, 2000.)
- Feldman, G., *Politics, Society, and the Klan in Alabama, 1915 – 1949*, (Tuscaloosa, AL: University of Alabama Press), 1999.
- Friedman, R.E., *Who Wrote the Bible?* (New York, NY: Harper/San Francisco Press), 1997.
- Fullilove, M.T. and Fullilove, R.E., Stigma as an obstacle to AIDS action: The Case of the African American Community, *American Behavioral Scientist*, 42(7): 1117-1129, 1999.
- Gasman, D., *The Scientific Origins of National Socialism: Social Darwinism in Ernest Haeckel and the German Monist League*, (New York, NY: American Elsevier), 1971.
- Gossett, T.F., *Race: The History of an Idea in America*, (New York, NY: Schocken Books), 1963.
- Graur, D. and Li, W., *Fundamentals of Molecular Evolution 2<sup>nd</sup> Ed.*, (Sunderland, MA: Sinauer Associates), 2000.
- Graves, J.L., Why We Should Teach Our Students About Race, *Reports of the National Center for Science Education*, v22 n3 p23-26 May-Jun 2002.
- Graves, J.L. *The Emperor's New Clothes: Biological Theories of Race at the Millennium*, soft cover edition, 2<sup>nd</sup> printing with a new preface by the author, Rutgers University Press, 2005a.
- Graves, J.L., *The Race Myth: Why We Pretend Race Exists in America*, soft cover edition with a new preface by the author (New York, NY: Dutton Books), 2005b.
- Graves, J.L., What we know and what we don't know: Human Genetic Variation and the social construction of race, for *Is Race Real?*, a collection of essays solicited by The Social Science Research Council, edited by Craig Calhoun, President Social Science Research Council, April 6<sup>th</sup> 2005c.
- Graves, J.L. and J. Leigh (1994) Materialist philosophy, Evolutionary Biology, and African-American Students II: Empirical Evidence, in: *Race in a Global Society; University of Oklahoma Symposium in African-American Studies*, November 1993.
- Hamer, D. and Copeland, P., *Science of Desire: The Gay Gene and the Biology of Behavior*, (New York, NY: Touchstone), 1995. Hebel, S. and Schmidt, P., Bob Jones U shifts its policies on interracial dating by students, *The Chronicle of Higher Education*, March 17: A39, 2000.
- Harris, G., The plurality of the races, and the distinctive character of the Adamite species, *Anthropological Review*, Vol. 5, No. 17, pp. 175-187, 1867.
- Harrold, F.B. and Eve, R.A., *Cult Archaeology and Creationism: Understanding Pseudoscientific Beliefs About the Past*, (Iowa City, IA: University of Iowa Press), 1995.
- Hedges, S., Kumar, S., Tamura, K., and Stoneking, M., Human origins and analysis of mitochondrial DNA sequences, *Science* 255:737-739, 1992.
- Hick, John, *An Interpretation of Religion: Human Responses to the Transcendent*, second edition, New Haven: Yale University Press, 2004.
- Hick, John, *The New Frontier of Religion and Science: Religious Experience, Neuroscience and the Transcendent*, New York: Palgrave MacMillan, 2006.
- Holden, C. and Bagla, P., "Bush squeezes between the lines on stem cells," *Science* vol. 293: 243-245, 2001.
- Hull, D., *Darwin and his Critics: The Reception of Darwin's Theory of Evolution by the Scientific Community*, (Cambridge, MA: Harvard University Press), 1973.
- Irons, P., *The Courage of Their Convictions*, (New York, NY: The Free Press), 1988.
- Jackson, D.Z., At Bob Jones U., A Disturbing Lesson About The Real George W., *Boston Globe*, February 9, 2000.
- Jeffries, J., *The Natural History of the Human Races*, (New York, NY: E.O. Jenkins), 1869.
- Kant, Immanuel, *Religion Within the Limits of Reason Alone*, translated by Theodore M. Greene and Hoyt H. Hudson, New York: Harper Torchbooks, 1934, 1960.
- Lawson, A.E. and Worsnop, W.A., Learning about evolution and rejecting a belief in special creation: Effects of reflective reasoning skill, prior knowledge, prior belief, and religious commitment, *Journal of Research in Science Teaching*, 29: 143-66, 1992.

- Lewontin RC. The apportionment of human diversity. In: Dobzhansky T., Hecht M.K, Steere W.C., editors. *Evolutionary Biology* 6. New York: Appleton-Century-Crofts. 1972. pp. 381–398.
- Li, J.Z., Absher, D.M., Tang, H., Southwick, A.M., Casto, A.M., Ramachandran, S., Cann, H.M., Barsh, G.S., Feldman, M., Cavalli-Sforza, L.L., Myers, R., Worldwide genetic relationships inferred from genome-wide patterns of variation, *Science*, Vol. 319: 1100-1104, 2008.
- Lohmueller, K.E., Indap, A.R., Schmidt, S., Boyko, A.R., Hernandez, R.D., Hubisz, M.J., Sninsky, J.J., White, T.J., Sunyaev, S.R., Nielsen, R., Clark, A.G., Bustamante, C., Proportionately more deleterious genetic variation in European than in African populations, *Nature Genetics* Vol. 451: 994-998, 2008.
- Long, J.C. and Kittles, R., “Human genetic diversity and the non-existence of biological races,” *Human Biology* 74(4): 449 – 471, 2003.
- Mayer, G.T., *New Evidence for the Existence of Two Human Origins*, (Bloomington, IN: Authorhouse), 2007.
- Mayr, E., *The Growth of Biological Thought: Diversity, Evolution, and Inheritance*, (Cambridge, MA: Harvard/Belknap Press), 1981.
- Mazur, A., Believers and disbelievers in evolution, *Politics and the Life Sciences* 23(2): 55 -61, 2005.
- McIver, T. The Protocols of Creationism, *Skeptical* 2: 76-87, 1994.
- McKee, J.K., Poirer, H. and McGraw, W.S., *Understanding Human Evolution*, 5<sup>th</sup> Ed., (Saddle River, NJ.: Prentice Hall), 2005.
- Mecklin, J.M., *The Ku Klux Klan*, (New York, NY: Harcourt Brace Co.), 1924.
- Miller, J.D., Scott, E., and Okamoto, S., Public Acceptance of Evolution, *Science* 313: 765-766, 2006.
- Montagu, A., *Man’s Most Dangerous Myth: The Fallacy of Race*, 3<sup>rd</sup> Edition, (New York: Harper and Brothers Publishers, 1952).
- Moore, J.S., *Pre-Glacial Man and Geological Chronology*, (Dublin: Hodges, Smith, and Foster), 1868.
- Moore, R., Two perspectives on teaching evolution: America’s anti-evolution movement, *Academic Questions*, Spring: 69 -78, 2002.
- Moore, R., Teaching Evolution: Do State Standards Matter? *BioScience* 52(4): 378-81, 2002.
- Moore, R., Racism and the public’s perception of evolution, *Reports of the National Center for Science Education*, 22(3): 16-18, 23-25.
- Morris, H., *The Beginning of the World: A scientific Study of Genesis*, 2<sup>nd</sup> Edition, (Green Forest, AR: Master Books), 1991.
- Myres, S.L., *Westering Women and the Frontier Experience 1800-1915*, Ray Allen Billington, Series Gen. Ed., Series: Histories of the American Frontier Series, (Albuquerque, NM: University of New Mexico Press), 1983.
- Nei, M. and Roychoudhury, A., “Gene differences between Caucasian, Negro, and Japanese Populations,” *Science* 177: 434-435, 1972.
- Nei, M. and Roychoudhury, A., “Genic variation within and between three major races of man, Caucasoids, Negroids, and Mongoloids,” *Am. J. Human Genetics*, 26:421-443, 1974.
- Neese, R.M. and Williams, G.C., *Why We Get Sick: The New Science of Darwinian Medicine*, (New York, NY: Vintage Books, 1996.)
- Norton H.L., Kittles R.A, Parra E., McKeigue P., Mao X., Cheng K., Canfield V.A., Bradley D.G., McEvoy B., Shriver M.D., Genetic evidence for the convergent evolution of light skin in Europeans and East Asians, *Molecular Biology and Evolution*, 24(3):710-22, 2008.
- Nye, Malory, *Religion: The Basics*, New York: Routledge, 2003.
- Oakley, B., *Evil Genes: Why Rome fell, Hitler Rose, Enron Failed, and My Sister Stole My Mother’s Boyfriend*, (New York, NY: Prometheus Books.)
- Pals, Daniel L., *Eight Theories of Religion*, second edition, New York: Oxford University Press, 2006.
- Pennisi, E., Breakthrough of the Year: Human Genetic Variation, *Science* vol. 318: pp. 1842-3, 2007.
- Pew Research Center, Optimism About Black Progress Declines: Blacks see growing values gap between poor and middle class, <http://pewsocialtrends.org/pubs/700/black-public-opinion>, November 13, 2007.
- Pride, R.A. and Vaughan, H., Neighborhood Again? Race, educational interest, and traditional values, *Urban Education* 34(3): 389 – 410, 1999.
- Purdom, G., Answers in Genesis: Junk DNA, <http://www.answersingenesis.org/articles/am/v2/n4/junk-dna-part-2>, 2008.
- Rice, A.S., *The Ku Klux Klan in American Politics*, (Washington, DC: Public Affairs Press), 1962.
- Rolston, Holmes III, *Genes, Genesis and God: Values and Their Origins in Natural and Human History*, Cambridge: Cambridge University Press, 1999.



- Rose, M.R., *The Long Tomorrow: How Advances in Evolutionary Biology Can Help Us Postpone Aging*, (New York, NY: Oxford University Press), 2005.
- Rosenberg, E.M., *The Southern Baptists*, (Knoxville, TN: University of Tennessee Press), 1989.
- Roughgarden, J., *Evolution's Rainbow: Diversity, Gender, and Sexuality in Nature and People*, (Berkeley, CA: University of California Press), 2004.
- Smith, W.B., *The Color Line: A Brief in Behalf of the Unborn*, (New York, NY: McClure, Phillips & Co.), 1905.
- Stokes, J.P. and Peterson, J.L., Homophobia, self-esteem, and risk for HIV among African American men who have sex with men, *AIDS Education and Prevention*, 10 (3): . 278-292, 1998.
- Stringer, C. (1990) The Emergence of Modern Humans, *Scientific American*, December, p. 98.
- Svedlund, A. and Anderson, D., Gordon Creek Woman meets Kennewick Man: New interpretations and protocols regarding the peopling of the Americas, *American Antiquity* 64(4), 569-576, 1999.
- Tall Bear, Kimberly, DNA, blood, and racializing the tribe, *Wicazo Sa Review*, Spring 2003, pp. 81- 107.
- Templeton, A.R., Human origins and analysis of mitochondrial DNA sequences, *Science* 255:737, 1992.
- Templeton A.R, Human races: a genetic and evolutionary perspective, *American Anthropologist*, 00:632–50, 1998.
- Tishkoff, S.A., Dietzsch, E., Speed, W., Pakstis, A.J., Kidd, J.R., Cheung, K., Bonn -Tamir, B., Santachiara-Benerecetti, A.S., Moral, P., Krings, M., P  bo, S., Watson, E., Risch, N., Jenkins, T., Kidd, K.K., Global Patterns of Linkage Disequilibrium at the CD4 Locus and Modern Human Origins, *Science*, March 8, p. 1380, 1996.
- Tishkoff, S.A., Pakstis, A.J., Stoneking, M., Kidd, J.R., Destro-Bisol, G., Sanjantila, A., Lu, R.B., Deinard, A.S., Sirugo, G., Jenkins, T., et al., “Short tandem-repeat polymorphism/alu haplotype variation at the PLAT locus: Implications for modern human origins,” *Am. J. Hum. Genet.* 67: 901–925, 2000.
- Tishkoff, S. and Kidd, K., “Implications of biogeography of human populations for ‘race’ and medicine,” *Nature Genetics Supplement*, No. 11, November 2004, pp. S21-S27.
- UNESCO, *Race and Science: The Race Question in Modern Science* (New York: Columbia University Press, 1961) and “No scientific basis for race bias found by world panel of experts,” *The New York Times*, July 17, 1950. The list of notable geneticists who reviewed the 1950 UNESCO statement before its publication included E.G. Conklin, Th. Dobzhansky, L.C. Dunn, Julian S. Huxley, and Hermann J. Muller.
- Unger, C., *House of Bush, House of Saud: The Secret Relationship Between the World's Two Most Powerful Dynasties*, (New York, NY: Scribner), 2004.
- Vigilant, L., Stoneking, M., Harpending, H., Hawkes, K., and Wilson, A., African populations and the evolution of human mitochondrial DNA, *Science* 253:1503-1507, 1991. Whittam, T.S., Clark, A.G., Stoneking, M., Cann, R., Wilson A.C., Allelic variation in human mitochondrial genes based on patterns of restriction site polymorphism, *Proc. Natl. Acad. USA* vol. 83: pp. 9611-9615; 1996.
- Winchell, A., *Preadamites or A Demonstration of the Men Before Adam; Together with A Study of Their Condition, Antiquity, Racial Affinities; and Progressive Dispersion Over the Earth*, (Chicago: S.C. Griggs and Co.), 1890.
- Wright, S., *Evolution and the Genetics of Populations, Volume 4: Variability within and among natural populations*, (Chicago: U. Chicago Press, 1978).

Published by the Forum on Public Policy

Copyright   The Forum on Public Policy. All Rights Reserved. 2008.