Design? Yes!
But is it intelligent?

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Intelligent Design Argument

Intelligent design theory is easily stated in four easy steps.

1. Observation and analysis of natural phenomena, from astrophysics to microorganisms here on earth to sub-atomic chemistry.

2. Discovery that a structure is "irreducibly complex."

3. First conclusion: An intelligent designer created the "irreducibly complex" structure.

4. Second conclusion: The intelligent designer is the researcher's preferred deity or purposive force. Advocates of intelligent design theory generally deny this step (since such discrimination is impossible), but do make the conclusion anyway at a personal level.

The ID advocates in this volume believe that the Christian God created the "irreducibly complex" structures, which cannot occur naturally. Thus they earn the title, "ID creationists," to be distinguished from "young-earth (YE) creationists," who also believe that the Christian God created "irreducibly complex" biological structures, but also that the earth has a history of not more than 10,000 years. YE creationists base this view upon their reading of the Bible, and fossil evidence, geological indications of a Great Flood, and many objections to evolutionary biology. Both groups of creationists believe strongly that aspects of biological organisms were supernaturally, intelligently designed, and that the existence of the Christian God can be deduced from the existence of "irreducibly complex" biological structures. Taken together, these groups of creationists are only a drop in the bucket of worldwide believers in intelligent design.

Who believes in intelligent design theory (or a less academic sounding version)? Five times so far, Gallup has polled public beliefs about evolution, in 1982 (corresponding to the centenary of Charles Darwin's death), 1991, 1993, 1997, and 1999 (www.gallup.com/poll/releases/pr990830.asp) The results are all close, almost indistinguishable statistically. These are the figures for 1999.

God created man pretty much in his present form at one time in the last 10,000 years or so. 47%

Human beings have developed over millions of years from less advanced forms of life, but God guided this process. 40%

Human beings have developed over millions of years from less advanced forms of life. God had *no part* in this process. 9%
No opinion. 4%

The percentage for the third question is too large. When you subtract the "naturalists" who believe in some intelligent design from sources other than "God" (Tao, etc.), the true naturalists shrink to the neighborhood of 5%. About 90% choose intelligent design. So it goes for the USA.

But what about the rest of the world? Virtually every place will have a lower percentage of late arrival humans, but will have a correspondingly higher percentage in the "God guides the process" (as long as other purposive intelligences are included), thus barely changing the vast majority who believe in intelligent design of biological organisms.

Intelligent design thinking, or perhaps more accurately the *feeling of intelligent design,* is the foundation stone of belief in a deity or at least some kind of intelligent designer. No other argument for the existence of a deity is more accessible or persuasive. Examination of biological organisms, including humans, leads immediately to belief they are intelligently designed.

This belief is only the first step. All else flows more easily from the existing belief in an intelligent designer, including life after death, ultimate foundations for ethics, ultimate meaning in life, and human free will. This ball of wax sure is attractive.

Jehovah's Witnesses stopped by yesterday when I was away in town. They know I am an atheist but we have a very warm relationship. They usually stop when they have something for me. This time it was an issue of their journal, *Awake!* (January 22, 2000), the cover showing a young girl holding out her hand, a lovely butterfly perched on her outstretched finger, with the title: "Life: A Product of Design." The first two articles in the issue give more detailed accounts of intelligent design–for example, the skin of crocodiles, spider webs, woodpeckers surviving smashing their bills on trees, hummingbird thermal efficiency, production of firefly lights, and many more.

What had produced these remarkable adaptations? The question is answered in the section, "Behind the Design–A Designer." Building on the work and authority of Michael Behe (including four quotes from his *Darwin's Black Box*, *Awake!* concludes: "Is it not reasonable, therefore, that this Agent also has a purpose, one that includes humans? If so, what is that purpose? And can we learn more about our Designer himself?"(pp. 8-9)

In article three, "The Great Designer Revealed," we discover (surprise!) a picture with an open Bible and two pictures of wild parrots and a tropical fish, with the heading, "The Bible and the book of nature reveal the Great Designer." Witnesses resoundingly reject biological evolution, but do believe in an old earth, distinguishing themselves from YE creationists. *Awake!* is printed in 20 million copies, and in 83 languages.

Intelligent design theorists live in a highly receptive world. Walking through New York City, or Hong Kong, or local villages and towns, anywhere almost, at least nine of ten people think organisms are intelligently designed. Advocates of the "new" ID argument in this book are not bucking the tide of opinion, they are riding the crest of overwhelming, worldwide support.

The current ID creationists wish to distance themselves from this vastly larger branch of YE (young-earth) creationists, but to the outsider, the two groups have more in common than differences. Both are ID creationists, but one group believes in an older earth and the other a young earth. The YE creationists also think they pay more attention to the Bible; so do the ID creationists, though somewhat more liberally, to this observer. Perhaps more pertinent, YE creationists also believe they can do science perfectly well. YE creationists are not pleased with the "superiority" attitude of the ID creationists.

ID creationists also generally reject evolution by descent, entirely apart from natural

selection. Phillip Johnson, the acknowledged leader of the movement, in his most biological book, *Darwin on Trial*, spends five chapters (4-8) arguing against evolution by descent. He attacks whale and wing evolution by descent, giving the impression that the Christian God made whales and wings. The Christian God could very well have guided every bit of the entire evolutionary process, but ID creationists require their intelligent designer to make "mousetraps" along the way. Dembski, Wells, Nelson, and others in this volume reject evolution by descent and argue that evolutionists have no good evidence for it. The ID creationists and YE creationists are not so far apart.

Why do advocates of the ID argument constantly paint themselves as a beleaguered minority? Perhaps the opinions of philosophers, evolutionary biologists, religious methodological naturalists (who act like naturalists when doing science, but disbelievers in naturalism in their true selves), writers of science textbooks at all grade levels, NOMA (S.J. Gould's Non-Overlapping Magisteria) believers, and liberal arts faculty generally count for more to the intelligent design theorist than mere overwhelming popular support.

Will's views on intelligent design

I am very sympathetic to those who believe in intelligent design. The sense of loss experienced by friends and students after concluding that intelligent design of biological organisms is nonexistent, is deep and sometimes very difficult. When belief in intelligent design dies away, the other associated beliefs become tenuous: life after death, etc. I always recommend to students taking an evolution course to guard carefully their views of intelligent design in biological organisms. Give it up, and the slide to naturalism flows quickly.

Intelligent design theory, in its ID movement garb, is basically a version of "God of the Gaps." The standard problem is that this position is constantly retreating, as the "irreducible" structures become understood as "reducible." Plato's *Timaeus* is a direct argument for intelligent design of the heavens, earth, and biological organisms. The organization and harmony of the heavens or organisms necessitated the existence of an intelligent creator. Galileo, Kepler, Isaac Newton and so many other famous scientists used the same basic argument. Between Plato and Newton, the argument from intelligent design could operate over a huge variety of celestial phenomena and organisms.

The retreat since Newton's day of the obvious examples of intelligent design is striking. Now Michael Behe has to plumb the depths of biochemical structures in the cell to find "irreducibly complex" mousetraps. Even in the fullness of time, many of his examples will never be completely solved from a naturalist perspective, simply because the structures are buried in some two to three and one half billion years of evolutionary history. Likely stories will abound, however, suggesting naturalistic ways the evolution *could* have happened.

I read the following quotation to students in my evolution course for non-majors in biology:

> The real difficulty for the mechanistic theory is that we are forced, on the one hand, to postulate that the germ-plasm is a mechanism of enormous complexity and definiteness, and, on the other, that this mechanism, in spite of its absolute definiteness and complexity, can divide and combine with other similar mechanisms, and can do so to an absolutely indefinite extent without alteration of its structure,. On the one hand, we have to postulate absolute definiteness of

> structure, and on the other absolute indefiniteness.

I then ask the students what is this material, and they shout in unison, DNA! The next paragraph continues:

> There is no need to push the analysis further. The mechanistic theory of heredity is not merely unproven, it is impossible. It involves such absurdities that no intelligent person who has thoroughly realised its meaning and implications can continue to hold it.

Students are amazed. Who is this? The author is John Scott Haldane, renowned physiologist and father of the famous evolutionist J. B. S. Haldane, writing in 1914 (*Mechanism, Life and Personality*).

Beginning with the notion of genes in the first decade of the 20th century, many scientists thought that heredity must be "irreducible." The problem was that nucleic acids were too boring in structure to be the hereditary material, and proteins basically unsuited. Yet this material basis of heredity had to replicate like crazy (the hereditary material had to be simple to do that) and then transfer very complex information to the organism (the hereditary material must be very complex indeed). For more than 40 years J. S. Haldane's view was common among scientists.

Heredity probably would have been on Michael Behe's list had he worked in 1914. DNA turned out to be the basis of the most materialistic, mechanical system of inheritance, exactly what J. S. Haldane envisioned, but considered impossible. An "irreducibly complex" phenomenon of nature became the materialistic science of today.

Perhaps someone can explain to me why I cannot see intelligent design in biological organisms. Precisely because I looked and looked and found no intelligent design contributed strongly to my move to atheism. Yet ID creationists can see intelligent design where I see none. If supernatural design were clear, why can I not see it? The examples given in *Rhetoric and Public Affairs (*volume 1, no. 4, on which this book is based), seem general and weak except for Behe's biomolecular machines. Advocates of ID end up citing Behe over and over again. One might think that a volume on ID would have lots and lots of robust examples.

Dembski claims that the ID argument gives good suggestions for research. His best example is the apparently selectively neutral DNA, the vast majority of which codes for nothing. Following ID, the researcher should proceed on the assumption that all the DNA is actually functional (the Creator creates nothing useless?). All ID advocates must oppose Kimura's neutral mutation/random drift theory, or even Tomoko Ohta's nearly neutral theory of evolution. I consider these two revolutionary giants to have made the greatest contribution to evolutionary biology since the work of Charles Darwin, even if in mammals the proportion of selectively neutral DNA moves from about 95% of the total to 80%.

Incidentally, Charles Darwin might help to provide examples for ID theorists. His book, *On the Various Contrivances by which Orchids are Fertilised by Insects* (2nd edition, 1862), is jammed with examples of flower structures insuring that insects are dusted with pollen, and later striped of it, in cross fertilizing plants of the same species. Not only do many of the "contrivances" smack of mousetraps, but the entire system of particular insects adapted to fertilize only one species of orchids appears to be an "irreducibly complex" mechanism. Indeed, Darwin chose to study these plants precisely because botanists had traditionally described them as flowing from the intelligence of a creator. Of course, Darwin did have explanations. He described the contrivances as "beautiful adaptations."

> When this or that part has been spoken of as adapted for some special purpose, it

> must not be supposed that it was originally always formed for this sole purpose. The regular course of events seems to be, that a part which originally served for one purpose, becomes adapted by slow changes for widely different purposes. (p. 282)

The ID movement needs an expert in orchid fertilization to counter Darwin's naturalistic explanations. This advocate of ID will also have to deal with Professor Douglas Gill with the Department of Zoology at the University of Maryland, an expert on insect fertilization of orchids.

In 1998, Edward Larson and Larry Witham conducted a poll of the National Academy of Sciences (USA); 95% of biologists responding disbelieved in any kind of designing deity. Of scores of evolutionists around the world in my sphere, only a tiny proportion believes in intelligent design. I am right in with them. We can see no sign whatever of intelligent design in biological organisms, or intelligent direction in evolution. Design, yes. Intelligent design, no.

I will give only one example of why I reject intelligent design (there are many more–lack of space). The intelligent designer isn't all that intelligent. I asked Dave Raup and Jack Sepkopski to estimate for me how many species of vertebrates existed at the end of the Cretaceous, about 70,000,000 years ago. They said about 50,000. And how many exist now, I asked. They said about 100,000. Then the crucial question: how many of the species of vertebrates 70,000,000 years ago gave rise to all that exist now? They said probably less than 20, but at the outside, 25. Then of the 50,000 or so species, all but 25 went extinct. And in the interval of 70 million years, most of the species of vertebrates that came into existence also went extinct. The inventions of the intelligent designer are poor survivors.

What about natural selection? Natural selection is not a mechanism, does no work, does not act, does not shape, does not cause anything. Biologists are very lax in their language, and so was Charles Darwin. Natural selection is outcome of a very complex process that basically boils down to heredity, genetic variation, ecology, and demographics. What emerges we call natural selection. The process yields organisms with adaptations, which help them to survive and flourish. The process also virtually guarantees extinction when the environment changes sufficiently, which it does. The intelligent designer appears to have no concept of environmental change. The pattern of extinction, however, is precisely what one would expect of the process producing adaptations. If one gets to Carnegie Hall by "practice, man, practice," then one understands natural selection as "demographics, man, demographics," followed by extinction.

Methodological naturalism

First, we must clarify terminology. A "metaphysical" naturalist thinks that everything detected by humans is natural, not supernatural. This I will call "All-Weather" (A-W) naturalism. A "methodological" naturalist thinks that when doing science, make like an A-W naturalist; but in prayer, moral decisions, belief in gods, etc., reversion to supernaturalism is reasonable. This view I will call "Fair-Weather" (F-W) naturalism. When the going gets tough (will I survive death?), F-W naturalists take refuge in the supernatural. A-W naturalists just have to grit their teeth and meet the tough issues head-on.

Religious scientists have a problem. Scientists today, unlike the scientists of more than 150 years ago, generally dislike any presence of the supernatural in the natural. So to be accepted, religious scientists must conduct science without any mention of God, or religion

generally. To escape this problem, lots of religious scientists adopt F-W naturalism. In science, F-W and A-W naturalists are indistinguishable.

F-W naturalists do not wish to be caught in the embarrassing position of finding evidence for intelligent design and then having to take it back. They are also happy to end the special pleading from intelligent design in nature to any particular deity, an embarrassing issue for advocates of ID. An added advantage for F-W naturalists is escape from the designation "creationist." The "God of the Gaps" disappears as a problem. So the attractions of F-W naturalism are great.

These advantages must be weighed against the downside of F-W naturalism. The argument from intelligent design disappears. Hmmm. Giving up that argument, used by the vast majority of people around the world, is quite a blow to religious thinking.

Is there a way out? Sure. A F-W naturalist eschews the intelligent design argument. Science is science. But this person discovers a deity or purpose in some other way, for example reading a religious text such as the Bible or Chuang Tsu, having a personal experience with the deity, believing on the authority of others, or using a torturous academic argument for the existence of the deity. F-W naturalists, once belief in the deity is established, can then mysteriously detect the deity's handiwork in nature. This rationalization is a perfect example of having sashimi and eating it too (I am married to a lovely Japanese woman, and we like sashimi much more than cake). Having intelligent design and not having intelligent design hardly seem compatible.

Another major problem with F-W naturalism is that it is plain old A-W naturalism. Everything that A-W naturalism applies to is something subject to F-W naturalism. Problem: did Mary give virgin birth to baby Jesus? The A-W naturalist responds, "No, mammals don't have virgin births, but if they did, the offspring would have to be the same sex. Let's do a paternity test and find who actually was the father." The F-W naturalist says exactly the same thing! Problem: how can we explain the existence of highly religious people? The A-W naturalist says, "Probably the religious person grew up hearing every day about the deity. She thinks the deity speaks to her, or perhaps humans have an inborn need for a deity, etc." The F-W naturalist again says the same thing.

Or, perhaps, the F-W naturalist argues that a few, or many, miracles occur. The A-W naturalist says then to the F-W naturalist, "please take the naturalist out of your name because you don't even pretend to believe in naturalism any more." No wonder I sympathize with intelligent design theorists. If they are right, then the belief of the vast majority of people in the world is justified. If the F-W naturalists are right, then the vast majority of people around the world have been bamboozled, including most of the important characters in the great religious texts. The advocates of intelligent design have a sea of popular support and advocates of F-W naturalism have the support of some thoughtful college students and professors.

Stephen Jay Gould's Principle of NOMA

Steve and I have been friends since we met at Ernst Mayr's conference on the evolutionary synthesis in May, 1974. He has lauded much of my work in the history of modern evolutionary biology. In turn, I have long admired his scientific work and been plenty irritated at the National Academy of Sciences for taking so long to send him an invitation to join. He is president of the American Association for the Advancement of Science this year. I am also certain that he is far

and away the most influential and widely known historian of science in the world–although most of my fellow historians of science don't much like this observation. His popular essays are an international treasure.

On the issue of science and religion, however, we are poles apart. Gould's new book, *Rocks of Ages: Science and Religion in the Fullness of Life*, announces his Principle of NOMA (Non-Overlapping Magisteria). Science and religion each has its own sphere of influence, and they do not overlap. Or rather, science and religion *should* stay apart, and thus all warring of science and religion will stop, and we will all live together in greater harmony. Problems in the relationship of science and religion are almost always, according to Gould, caused by a violation of NOMA. Almost everyone agrees that greater harmony in society is a fine goal.

One of Gould's favorite targets is belief in intelligent design of biological organisms. Advocates of intelligent design theory are directly violating NOMA. Thus in one fell-swoop Gould dismisses the favored view of some 90% of the population of the earth. I obviously agree with Gould about intelligent design in organisms, but think also that a real disagreement exists. Gould's solution is to push NOMA in hopes of reaching harmony. I suggest rising above the real disagreement and aiming for more harmonious social relationships.

The biggest problem is that NOMA only allows certain kinds of religion. Nearly all of the religions around the world would have to give up crucial parts of their belief systems. Gould says it is fine to believe that God created all creatures through the laws of science but this is basically deism, considered atheism in Isaac Newton's day.

Gould describes his own personal view as "agnostic," appropriately conciliatory in pursuit of NOMA. Does he treat his own scientific theories in a similar agnostic way? Does he say that he is an agnostic about the concept of punctuated equilibria, one of his favorite theories? No, after reviewing the evidence for a long time, he thinks his theory is a darned good first guess, a null hypothesis. You assume the theory, but as a good scientist, you are prepared to change your mind when contrary evidence is produced. That is why I consider agnosticism to be a cop-out. Atheism is a robust null hypothesis, but should be given up when evidence of a deity is clear. Gould, Thomas Henry Huxley (inventor of the term), and Charles Darwin all billed themselves as agnostics, although they somehow avoid being agnostics about natural selection. Gould appears to be saying that religion is fine as long as it can't be distinguished from atheism in the natural world.

For many years, Gould has bashed creationists. This year he wrote an editorial in *Science* magazine, the official journal of the AAAS, excoriating the School Board in Kansas. In his new book, Gould is almost completely intolerant of young-earth creationists. NOMA, a principle, according to Gould, that is respectful, loving, simple, humane, and rational leads him to dismiss and denigrate half of the population in the USA.

Gould nominates Charles Darwin for the most sensitive advocate of NOMA. For a very long time, Gould has fought against scientists who try to pull moral conclusions out of the natural world:

> One of the saddest chapters in the entire history of science records the extensive misuse of data to support the supposed moral and social consequences of biological determinism, the claim that inequalities based on race, sex, or class cannot be altered because they reflect the innate and inferior genetic endowments of the disadvantaged. (p. 166)

In the *Descent of Man and Selection in Relation to Sex*, however, Darwin writes extensively

about social and moral faculties of humans, as affected by the process of natural selection, and about hereditary mental differences between men and women, and between human races. Darwin is vastly more a hereditarian about human social behavior than E. O. Wilson, often the target of Gould's barbs. Darwin violates NOMA flagrantly, in ways Gould finds particularly distressing, but in his mind, Darwin is the champion of NOMA.

I am sure Steve and I will remain good friends despite these genuine differences of views on science and religion. We share, incidentally, predictions of early death--he from mesothelioma (cancer of the mesothelium, the inside lining of the belly), and I from oligodendroglioma (cancerous brain tumor). Perhaps most importantly, we agree that we need a more humane, kindly society. He wants to rid the problems by his principle of NOMA, and I prefer to recognize the conflicts of life, and try to work with others to give us a more caring way of life.

Pedagogy in the teaching of evolution

In 1999, the state of Kansas School Board decided to eliminate macro-evolution from the state exams, and gave local school boards the right to decide if macro-evolution would be taught in the schools of the district. Evolutionists have a central processing email site, called *evoldir*. Job announcements constitute over 90% of the announcements. The Kansas School Board decision, however, elicited lots of derisive messages on *evoldir*. I sent the following message to the list.

> Dear kind members of *evoldir*,
>
> The Kansas decision is a gift to the teaching of evolutionary biology. At last we have begun to talk about including ALL students in high school biology classes, instead of limiting discussion only to naturalistic evolution.
>
> Of the USA population, nearly 50% are young-earth creationists. Of those who do profess belief in evolution by descent, the vast majority believe that God guided the process and that some version of "design theory" is true. Other countries have at least sizeable minorities with similar views. Can it really be our aim to prevent students with such views from participating honestly in the discussion of evolution in high school biology classes? Do we really believe that students can be convinced of evolution while prevented from speaking their concerns about it?
>
> We already have complete control of the evolution content of mainstream high school biology textbooks. Teachers bar most students from honest discussion of evolution in class, with the encouragement of the National Academy of Sciences (in *Teaching About Evolution and the Nature of Science* at http://www.nap.edu/readingroom/books/evolution98/ and my review at http://fp.bio.utk.edu/darwin/NAS_guidebook/provine_1.html), the National Center for Science Education (our watchdog), and the American Civil Liberties Union.
>
> The result is that students consider evolution perhaps the most boring subject of the biology class. But the evolution section of the course could be the most exciting, the most fun, and the most stimulating.
>
> "Teaching" creationism or design theory is wholly unnecessary, and perhaps illegal in the USA. Students will raise all their issues related to evolution

> if invited and not put down. Nothing is illegal about such discussion in the USA and probably elsewhere. Students will never forget the evolution section of the course, and will think about it for years, maybe for a lifetime.

Not much support for my contribution appeared on *evoldir*, but some rather negative comments appeared there and others sent privately. Indeed, many evolutionists were appalled by my suggestion, though some were supportive.

In this volume, Eugene Garver gives a cogent argument for not introducing ID or creationism in the evolution class. Perhaps he has taught an evolution class and finds suppressing most of the students from participating a good approach. If I thought teaching were as he envisions it, then I would just give up teaching instantly. Without student participation, introducing their own views and being prepared for intense criticism (but personally supportive), teaching is vacuous. Imparting knowledge is a bore. Give the students a book.

I have taught evolution everywhere from middle school (for 2 years) to high school (9 high schools in upstate NY, some every year) to college level, to graduate level, and to adult summer university. In every case, students have enjoyed greatly sharing and criticizing ideas and evidence concerning evolution. Even in a class of 400 or so, weekly sections of no more than 20 give students the opportunity for serious discussion. I think we learn a lot about evolutionary biology from Darwin to the cutting edge, and have lots of fun doing it. Everyone from every perspective is heartily invited to participate. The goal is not to fill the student's noggin with what is believed about evolutionary biology now, but to leave the student with an interest in evolution for life. Let me give a composite high school class.

Biology class in a small high school starts the section on evolution. The teacher follows Garver's advice. Jehovah's Witnesses in the class know far more than any other students in the class about evolution, and they are sure it did not occur. Witnesses begin thinking about evolution at a very early age. They are ready to talk about evolution in the class. The teacher forces these students to shut up, just as the students suspected. They must, the teacher says, learn the evolution presented in the textbook–approved by scientists at the National Academy of Sciences. They can *believe* whatever they wish, but must learn the approved science. The approved science is the dull, certain evolutionary biology presented in the biology textbook. Another biology class misses the excitement that free discussion of evolution promotes. And the unfairness is laid bare.

Let's try a different approach. The teacher thinks that evolution is an important subject, but thinks that all in the class should participate. All views presented are subject to comment and criticism. The Witnesses present their views against evolution. The evolutionists who believe that God guided the evolutionary process, and the naturalist students and others of various beliefs join in the discussion. The teacher offers: "Good discussion so far about evolution by descent. Now go to the computer room and look up evolution on the WWW and get more information in preparation for tomorrow's discussion" on natural selection, or the concept of species, or geographical distribution, or random genetic drift, or whatever topic the teacher wishes to address. Students are delighted because they are heard and taken seriously. The creationist student can go home and tell her mom and dad, "you should have seen how I put down the evolutionists today." No parents will be disappointed if their children are given the opportunity to speak and participate.

Allowing all students to participate defuses the explosive possibility of investigating evolution in high school classes. Not one parent of a high school student, over three decades, has

objected to this approach, the classes are exciting, and the students and high school teachers sure do send enthusiastic notes of thanks.

Discussing ways to prevent participation of students in any class, while privileging some, is so deeply unfair. Many states have suggestions for keeping creationists from the discussions in biology classes. The NAS booklet mentioned above has some good hints. Viewing half or more of your students as the "enemy" is weird.

Creationists will have to speak louder. I continue to support those who would like to have their voices heard in biology classes, and encourage the effort to limit the teaching of evolutionary biology until such time as evolutionists encourage a more inclusive participation of students. The very idea of the American Civil Liberties Union conspiring with evolutionary biologists to limit the free speech of the majority of the high school students in this country is grotesque.