



# The **BEACON**

*News from*

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## ***The Coalition for Excellence in Science and Math Education***

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*Volume XII, No. 4*

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*In this issue: President's Message—Lisa Durkin, About Lisa—Jerry Shelton, Interactions—Walt Murfin, Toon by Thomas—David E. Thomas, Early Evolutionary Example—Dr. Paul Braterman*

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### **PRESIDENT'S MESSAGE**

#### **The Persecution of a Science Teacher**

A science teacher named John Freshwater was suspended without pay in Mount Vernon, Ohio for refusing to remove a Bible from his desk. Freshwater had complied with the board's request to remove the Ten Commandments poster, as well as a box of Bibles, from his classroom. He also claimed that "I teach Ohio's standard curriculum and part of the state's standards is evolution." Nevertheless, the Mount Vernon School Board passed a resolution to terminate his contract pending an August 26, 2008 hearing. (Now postponed till October 1, 2008.) For more information from this point of view, see

[www.bibleonthedesk.com](http://www.bibleonthedesk.com),  
[www.supportfreshwater.com](http://www.supportfreshwater.com), and  
[www.lifesitenews.com/idn/  
printerfriendly.html?articleid=08062407](http://www.lifesitenews.com/idn/printerfriendly.html?articleid=08062407).

The Chicago Tribune, among others, has picked up on the "religious freedom" idea and on August 6, 2008 Tim Jones penned an article *Battle of Ideology in Ohio*. "Bible at center of Ohio town's divide over middle school science teacher accused of branding cross onto student's arm."

[www.chicagotribune.com/business/content/education/  
chi-creation-teacheraug04,0,1379046.story](http://www.chicagotribune.com/business/content/education/chi-creation-teacheraug04,0,1379046.story)

The article describes the conflict as splitting the community into two camps, "those who see Freshwater as a heroic figure, persecuted for his Christian beliefs and his insistence of having his personal Bible on his desk,

and those who condemn him as a religious predator promoting creationism and intelligent design and undermining the teaching of evolution, in violation of school policy."

#### **The Next Dover?**

You may be asking yourself what really happened at Mount Vernon Middle School to cause such a stir. The conflict is rife with so many inconsistencies that there must be some deceit lurking somewhere.

Here are the facts about the case, without the lies and omissions. Freshwater has been teaching middle school for 21 years. There have been complaints about him for at least the past 11 years, according to Lynda Weston, the Mount Vernon district's director of teaching and learning, but none have been filed by his sympathetic administrators.

One of the many lies and omissions that worm through this case: Freshwater claims that he never taught prohibited material, yet a supporter of his cause feely admits that Freshwater taught about the Biblical sinfulness of homosexuality to his students, which is unacceptable in any school district, as well as in direct violation of our Constitutional Establishment Clause.

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**Continued on page 2**

The Beacon is published quarterly by the Coalition for Excellence in Science and Math Education (CESE). A 501(c)3 nonprofit corporation, we are incorporated in the State of New Mexico. Visit our web site at [www.cesame-nm.org](http://www.cesame-nm.org).

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**Continued from page 1**

A former Superintendent, Jeff Mailey, said that he tried to find another position for Freshwater in 2003 but couldn't because he was certified only in science. Complaints have revolved around his avid proselytizing and refusal to adhere to the curriculum. In December 2007 Freshwater burned (branded) an easily identifiable cross into the arm of at least two eighth-grade students with a Tesla coil. One parent complained to the administration but didn't file a report with authorities because they didn't want to see Freshwater prosecuted or fired. The parent wanted their child's name held anonymously for fear of retaliation. When little was done about the complaint, the parents filed another complaint, on April 23, 2008, that discussed religious material found in Freshwater's classroom, along with the religious nature of his classroom teaching. Freshwater then received a letter from his new principal William D.White ordering him to remove all religious materials from his classroom. Freshwater agreed to remove all but his personal Bible. Although he removed many religious items from his classroom, he didn't remove all of the items and went so far as to check out a religious book from the library and display it near the lab table "to make a point". A monitor was assigned to Freshwater's class to document his conduct. Freshwater retaliated by gathering about 100 people on Mount Vernon's public square where he read a declaration of his God-given and Constitutional right to keep his Bible on his desk. He failed to mention the other concerns found in the complaint, including the branding incident. Within a few days, hundreds of Christian students, joined by parents and community members, gathered in a rally to support his cause. Some of his most ardent supporters are members of a local Christian group, a chapter of "Minutemen United". They envision themselves as existing to wage war against a culture of God-haters. ([www.minutemenunited.org](http://www.minutemenunited.org))

The school board met in executive session and decided to have an independent organization, HR On Call, Inc., investigate the allegations. This took all of May and part of June. During the investigation, HR On Call found other concerns raised by individuals who were interviewed. Here is a summary of findings from the investigation: (For their 15-page report, Google "HR On Call Mount Vernon.")

- A significant amount of evidence indicates that Mr. Freshwater's teachings, regarding subjects related to evolution, were not consistent with the curriculum of the Mount Vernon City Schools and state standards.
- Contrary to Mr. Freshwater's statement, the evidence indicates he has been teaching creationism and intelligent design and has been teaching the unreliability of

carbon dating in support of opposition to evolution. He has passed out materials to students for the past several years challenging evolution and then collecting the materials back from the students. He has done so in spite of specific directives not to teach religion, creationism or intelligent design.

- Mr. Freshwater did improperly use an electrostatic device on the student who filed the complaint, and other students in his science class, in a manner that was not in compliance with the manufacturer's instructions. There did not appear to be any intent by Mr. Freshwater to cause injury to any student.
- Contrary to Freshwater's statement that he simply made an "x" not a "cross", the burn is in the form of a cross.
- Based on Freshwater's own comments and information provided by attendees, his involvement with the Fellowship of Christian Athletes club exceeded the role of only being a monitor by regularly being an active participant in religious activities.
- Mr. Freshwater was insubordinate in failing to remove all of the religious materials from his classroom as ordered by his superior, Principal White, even after being instructed in writing to do so on April 16, 2008. .
- Several Bibles were kept in Mr. Freshwater's room including his personal Bible and one he checked out from the library and placed on a lab table near his desk.
- Freshwater kept materials in his room that could be used for the purpose of teaching subjects of a religious nature.
- Mr. Freshwater gave an extra credit assignment for students to view the movie "Expelled" which does involve intelligent design.

The report also noted how one ninth grade high school science teacher commented in an email in August 2007 that, "it is extremely unfair to have to start each school year re-teaching students how science actually works". High School science teachers documented how Freshwater's students were hostile to evolutionary science.

In June a federal lawsuit was filed, alleging civil rights violations by the Mount Vernon City School District

Board of Education superintendent Stephen Short, middle school principal William White, and science teacher John Freshwater. The allegations assert that during the 2007-2008 school year, Freshwater violated the United States Constitution as well as the policy of the Mount Vernon School district, and was not disciplined for those violations.

At the end of June, the Mt. Vernon School board voted unanimously to initiate termination proceedings against Freshwater. He was allowed to request a hearing and he did. The hearing is scheduled for August 20, 2008. (Rescheduled to October 1, 2008) The board's resolution cited four basic grounds for its resolution (summarized):

- Freshwater burned crosses in students' arms using scientific devices, ignoring the manufacturer's safety instructions.
- Freshwater taught material on thermodynamics, the Big Bang, the age of the earth, and the periodic table that is not in the approved curriculum or America Content Standards. He also taught ID and creationism in contravention of the curriculum and the First Amendment to the Constitution. He did so in direct contradiction of school board policy and administrative instructions. The resolution noted how Freshwater's 2003 request, to teach those materials, had been denied by the board; subsequently teaching them was insubordination.
- In monitoring the Fellowship of Christian Athletes, Freshwater exceeded his monitoring role.
- Freshwater did not remove all religious materials from his classroom as instructed by school administrators and in fact brought additional materials in to "make a point".

Shortly after the school board resolution, the Minutemen United group launched a drive to recall the Mt. Vernon School Board. Minutemen United was founded by David Dubenmire who was himself sued by the ACLU in 1999 for leading prayer for the high school football team which he coached. Dubenmire, a close friend of Freshwater, vehemently defends Freshwater's actions. Dubenmire claims that "With exception of the science experi-

ment, John Freshwater is teaching the beliefs and values that the majority of people in this community agree with. The only thing the On Call report found is evidence that Mr. Freshwater is a Christian.” Dubenmire also claims “The science experiment [the alleged burning of the student] took place in December, and the parents did not go to the police and didn’t file a criminal complaint. It was not until April, when John Freshwater refused to remove his Bible, that the school board rapidly made the decision to accuse him of things and then go back and find evidence.”

Is John Freshwater a victim of profoundly secular and anti-Christian public schools? Should Freshwater have the right to express his faith at school? Should he be commended, not pilloried, for upholding moral values? Is Freshwater a science teacher who is simply being persecuted for his religious beliefs?

John Freshwater has practiced great deception, insubordination and outright lies in the pursuit of standing by his religious convictions. He is not only guilty of teaching religion in public schools but of undermining the understanding of sound science methodology. His supporters have been masters of spin and exaggeration in supporting him. They have done their best to bully anyone who opposes them. What terrible arrogance and self-righteousness motivates people to practice such hypocrisy? A retired Mt. Vernon middle school teacher, Jeff George, commented about Freshwater, “He was promoting a particular belief system and preached against other religions, not just Muslims or Jew or Hindus, but also any Christian denomination that was different from his.” (*Freshwater Controversy Continues* by Pamela Schehl, *Mount Vernon News*, April 25, 2008)

This is not about John Freshwater’s personal Bible that he keeps on his desk for inspiration. Freshwater does not have the “religious freedom” to proselytize in his public school class room. He signed a contract to teach a specific curriculum which he flagrantly violated. His students have the right to a quality science program taught in a classroom that is free of religious bias. He and his supporters may pretend that this is about his Bible but it is really about his

deceit. John Freshwater isn’t a science teacher, he is a poser, a pretender, a preacher in a lab coat, and his school district enabled his actions for well over a decade. Real science teachers don’t teach fake science.

The federal lawsuit asserts that during the 2007-2008 school year Freshwater violated the United States Constitution as well as the policy of the Mount Vernon School district, and was not disciplined for those violations. An independent investigation has verified almost all of the allegations listed in the law suit. Hopefully Freshwater’s resounding defeat will send a message.

### Conclusion

What is truly alarming is that Freshwater is not the only science teacher who is a creationist who teaches his religious beliefs in class. The *June Beacon* reported a poll led by Michael Berkman. Two thousand high school science teachers across the nation were polled and sixteen percent identified themselves as creationists. A quarter of the teachers also reported spending at least some time teaching about creationism or intelligent design. Of these, 48% (12.5% of the total) said they taught it as a “valid, scientific alternative to Darwinian explanations for the origin of species”. The report concludes, “These findings strongly suggest that victory in the courts is not enough for the scientific community to ensure that evolution is included in high school science courses. ... Our study suggests that requiring all teachers to complete a course in evolutionary biology would have a substantial impact on the emphasis on evolution and its centrality in high school biology courses. In the long run, the impact of such a change could have a more reaching effect than the victories in courts and in state governments.”

I look forward to the day when CESE is no longer necessary, but as long as the John Freshwaters of the world exist, we are going to be necessary.. We don’t need this kind of “Salt and Light” in public education.

**Lisa Durkin**  
**CESE President**

## About Lisa

Lisa Durkin, our recently-elected president, has many years experience teaching science in New Mexico schools. She was born in Albuquerque, raised in Corrales, attended public schools till age 16, and then enrolled in the University of New Mexico. She graduated in 1988 with a degree in Secondary Education (major in Social Studies and minor in Science). Hired as an 8<sup>th</sup> grade science teacher, she moved to Los Lunas, where she still lives with husband and younger two of their three children. After seven years at middle school, not counting time off for raising young children, she transferred to Los Lunas High School and taught Geology and Astronomy for seven years.

Along the way, she completed her Master of Science Teaching degree from New Mexico Tech, and in 2001 was awarded Science Teacher of the Year by

Sandia Labs.

In 2003, Lisa served on the writing team that produced the new Science Content Standards, Benchmarks, and Performance Standards that replaced those which had been subverted by creationist influence. (Most of you will recall that Marshall Berman ran for election to the State Board of Education with the intent of putting evolution back into these standards.) While serving on the writing team, Lisa became acquainted with CESE member Malva Knoll. Later, Kim Johnson was able to persuade Lisa to join CESE.

We're happy to have the benefit of Lisa's knowledge and experience – and especially her enthusiasm.

**Jerry Shelton**



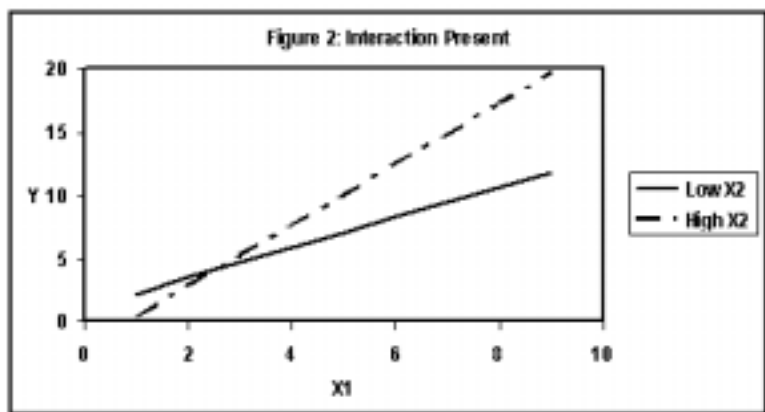
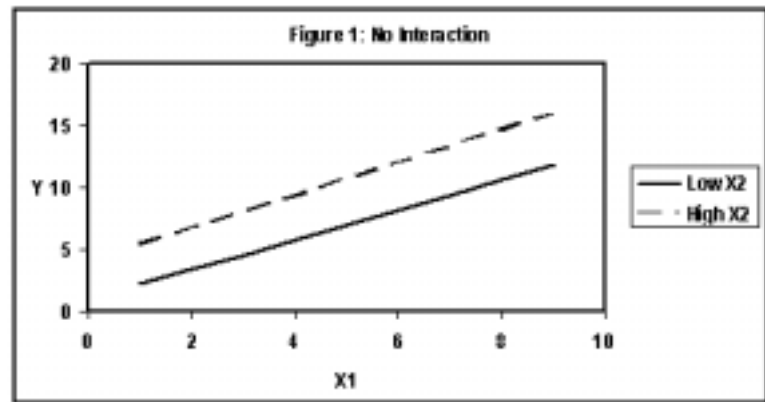
## INTERACTIONS

Let's review a little. **Independent variables** are those that an experimenter can manipulate or that an analyst can choose at will; they are the inputs. **Dependent variables** are the outputs. As the name implies, the values of dependent variables depend on the values of the independent variables. Just to make things thoroughly confusing, the independent variables might or might not interact with each other. They are noninteracting if the relation between one input variable and the output is the same for all values of the other input variable. If the relation between one input variable and the output variable is different for different levels of the other input variable, the two input variables are said to interact; an **interaction** is present.

It is easy to see if two input variables interact – just plot their outputs. Suppose the input variables are  $X_1$  and  $X_2$ , and the output variable is  $Y$ . We determine the value of  $Y$  over the range of  $X_1$  at low levels of  $X_2$ , then do the same at high levels of  $X_2$ . Now plot  $Y$  as a function of  $X_1$  at both levels of  $X_2$ . If they are parallel, as in Figure 1, no interaction is present.

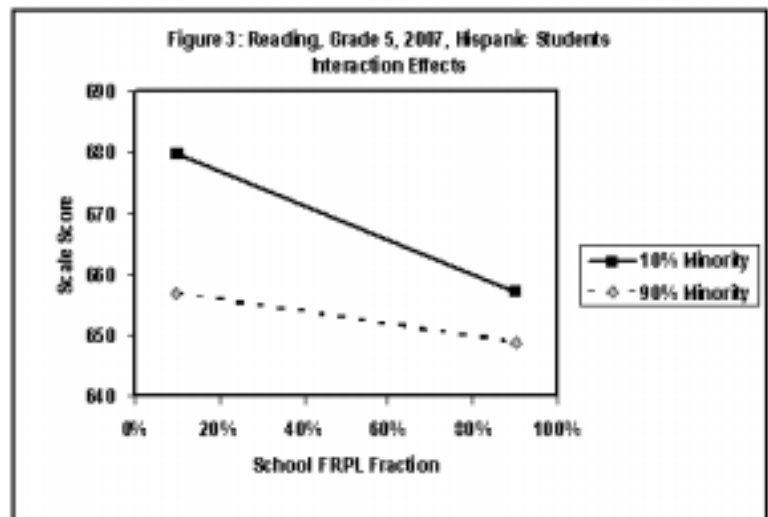
If the lines representing high and low values are not parallel, as in Figure 2, there is an interaction between variables  $X_1$  and  $X_2$ .

When no interaction is present, the effects on  $Y$  of  $X_1$  and  $X_2$  are **additive**. That is:  $Y = Y(X_1) + Y(X_2)$ . Noninteracting effects are not necessarily linear. Either or both can have nonlinear effects on  $Y$ . The essential feature for noninteracting variables is **additivity** of effects. In the simplest linear case:  $Y = A \cdot X_1 + B \cdot X_2 + E$ . However, if an interaction is present:  $Y = A \cdot X_1 + B \cdot X_2 + C \cdot X_1 \cdot X_2 + E$ , assuming linear effects. The effects of  $X_1$  and  $X_2$  are not additive in this case. The interaction term could be more complicated than a simple product. However, the simple product term as shown is usually adequate. If there are three input variables there could be four



interaction terms:  $X_1 \cdot X_2$ ,  $X_2 \cdot X_3$ ,  $X_3 \cdot X_1$ , and  $X_1 \cdot X_2 \cdot X_3$ . There are statistical tests for determining the presence and significance of interaction effects.

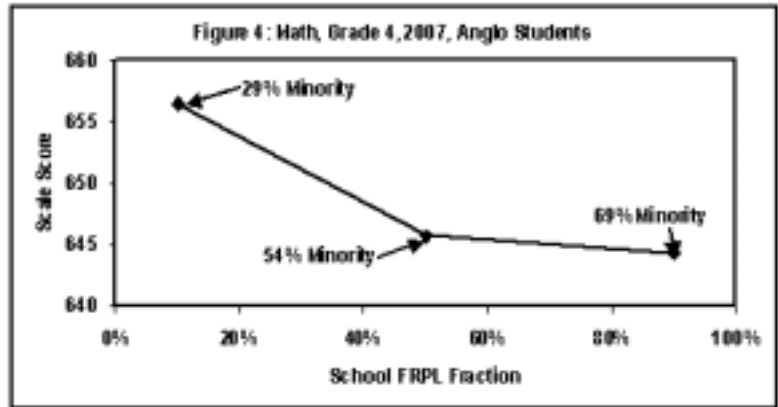
Significant interaction effects have often been found in analysis of test scores. Figure 3 shows scores of Hispanic students in schools with few minorities and in schools where most students are minorities. In the low minority schools, Hispanic student's scores have a strong dependence on the school's FRPL fraction. In high



minority schools, the dependence on school FRPL fraction is weaker. This interaction is significant.

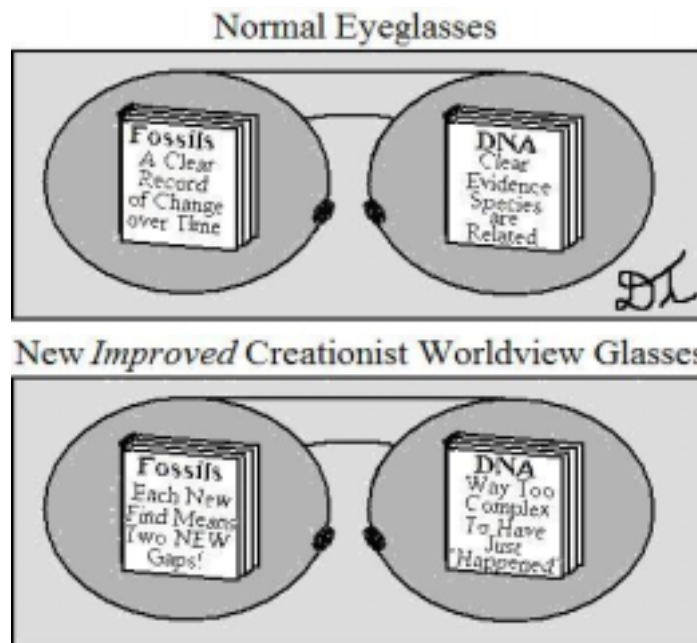
For simplicity, only a linear relationship with the school FRPL fraction has been shown here. A nonlinear relationship has been found for some grades and subjects. In many cases, there is a steep slope at low FRPL fractions but only a shallow slope at high FRPL fractions.

Figure 3 is not a truly realistic idealization. Because minority and FRPL fractions are strongly correlated, there are very few schools with a low minority fraction and a high FRPL fraction. Figure 4 shows average math scores of Anglo students for realistic combinations of minority and FRPL fractions, including interaction effects. A typical nonlinearity is also shown. A simple bilinear relation is shown as an approximation of the actual smooth curve. The scores of Anglo students in schools with few minority or FRPL students are quite sensitive to the FRPL fraction. The scores are less sensitive in schools with unfavorable demographics.



Significant interaction effects between minority and FRPL fractions have been observed for other subjects and grade levels, as well as other nonlinear effects. The effects can be different for other ethnic groups. There are also interaction effects on the scores of FRPL and non-FRPL students. This points up the complexity of demographic effects on performance. To attribute achievement gaps solely to poverty, as is often done, is simplistic and incorrect. Closing the ethnic and economic achievement gaps is, and must be, a major goal. Attempts to close the gaps based on a false understanding of ethnic and economic effects are almost certainly doomed to fail. It is essential that policy makers understand the complexities of achievement dependence.

**Walt Murfin**  
**CESE Statistician**



**Toon by Thomas**

<http://cesame-nm.org>



## Early Evolutionary Example

Proverbs, 6:6; “Go to the ant, thou sluggard; consider her ways, and be wise.” Bad advice. If you really want to learn how to succeed as a sluggard, go to the sea squirt.

The sea squirt, or tunicate, starts out a little bit like a tadpole, with a kind of backbone, a tail, and a primitive nervous system that guides it as it swims around looking for a well appointed rock in a good neighborhood. When it finds one, it sticks its head to the rock, changes shape, develops a thick outer skin, grows inlet and outlet tubes from its rear end, and, having no further use for its brain, eats it.

Such at least is the legend. The reality is even more interesting. It is no mere coincidence that the immature sea squirt resembles a tadpole, to which it is (as these things go) quite closely related. Along with lancelets and vertebrates, sea squirts form the phylum of *Chordata*, chordates. These have five defining features; a stiff rod along the back, a hollow dorsal nerve cord, pharyngeal slits or pouches (becoming gills in fish, tonsils and ear arches in you and me), a food-trapping groove known as the endostyle, and a rear tail (which in apes, including humans, is lost before birth). When the sea squirt settles down, the nerve cord is not so much eaten as reabsorbed, rather like a tadpole’s tail. Of the defining features, all that the adult sea squirt retains from its adventurous youth are its gills, which it now uses to pump water through its body, in one hole and out the other, trapping the plankton that it feeds on. Simple but effective and there are now some 3000 known species of sea squirts in shallow waters all over the world, sometimes sufficiently numerous to foul the hulls of ships and smother shellfish.

How close are more “advanced” animals to these creatures that spend their time brainlessly, upside down, permanently stuck to a rock? Are we, perhaps, just sea squirts that never grew up; an example of the process known as neoteny, in which more recently evolved species resemble the juvenile, rather than the adult, forms of their ancestors? There are indeed some tunicates (the *larvaceae*) that never settle down, and perhaps both vertebrates and lancelets are descended from these.

A pleasant notion, but wrong. Evidence from molecular biology, including now the study of micro-RNA as well as DNA, shows conclusively that tunicates and vertebrates are more closely related to each other than to the lancelets. In the ugly jargon of species classification, they are now placed together in the subphylum *Olfactores*, leaving the lancelets (*Cephalochordata*) out on their own.

One final twist in the tale (or tail). You might think that the adult form of larvacea would be directly related to the juvenile form of the sedentary tunicates. You would be wrong. If you follow the fates of individual cells in these free-living tunicates, you find that they match up with the adult, not the juvenile, form of their sedentary cousins, so that in their adult form their tails, like the main body of the sedentary tunicate, is rotated through 90° compared with the larva. Occam’s Razor, the principle that the simplest explanation is likely to be the best one, is extremely useful in the physical sciences, but much less so when applied to history. Evolutionary biology is a historical subject, and Occam’s Razor just doesn’t cut it.

**Dr. Paul Braterman**



Sea squirts from Britannica



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A promotional graphic for "NMSR Science Watch". It features a magnifying glass with a black handle and a silver frame. The lens of the magnifying glass is focused on a silhouette of human evolution, showing a progression from a small, crouching ape-like creature to a tall, upright human. The background of the magnifying glass lens is white. To the left of the magnifying glass, there is a smaller silhouette of the same evolutionary sequence. In the top left corner of the graphic, the text "AM1350" is written in a bold, purple font, with "PROGRESSIVE TALK" in a smaller, black font below it. At the bottom of the graphic, the text "Saturdays at 2 PM" is written in a large, black, sans-serif font, and "Albuquerque NM" is written in a smaller, red font below it. To the right of the magnifying glass, the text "NMSR" is written in a large, grey, 3D-style font, and "Science Watch" is written in a smaller, red font below it.

**NMSR**  
**Science Watch**