

The REALL News

The official newsletter of the Rational Examination Association of Lincoln Land

"It's a very dangerous thing to believe in nonsense." — James Randi

Volume 10, Number 4

April 2002

Energy Crisis by Robert Novella

Of all the scientific terms that have been usurped by pseudoscientists, the word "energy" would have to be the most abused. This word has a very specific meaning to physicists, but the lay press, and many people who are not familiar with its proper usage, distort its meaning and use it in misleading ways. This is especially true when the term is applied to organic matter such as the human body. This erroneous belief exists, in part, as a remnant of ancient beliefs in vitalism and chi in which a mysterious animating life energy pervades the human body, distinguishing it from non-living matter. Modern concepts of biology and energy, however, are diametrically opposed to this belief, exposing it for what it is, an ancient superstition with no place in modern scientific society.

The concept of vitalism dates back to the 1600s. It is part of the philosophy of idealism that contends that abstract immaterial aspects of the universe give rise to the material world. Proponents of the vitalism theory believe that the primary distinguishing factor between animate matter and inanimate matter is a "Vital Force" or "energy" that suffuses organic matter, rendering it "alive." So widespread was the belief in vitalism in the scientific community that Isaac Newton himself spent years fruitlessly searching for evidence of this energy in his many alchemical experiments.

The concept of a "life energy" itself, however, is not a mere four centuries old. Many ancient cultures have had similar beliefs since recorded time. China's version, chi or qi, is probably the most well known. It still has millions of faithful adherents. Traditional Chinese Medicine (TCM), itself at least 5,000 years old (Ivker, 1999), is a vast collection of folk-wisdom based on mystical thinking in which chi is one of the central concepts. Practitioners contend that "life-energy" courses through our bodies in pathways or channels called meridians (Homola, 99). These meridians branch off to all the major organs of our body. An inextricable part of the belief in chi is the concept of harmony or balance. All problems with life and health are directly related to an imbalance or interruption of these life-giving energies. Once harmony and balance is achieved, good health inevitably returns.

One of the modalities of TCM most familiar to western society is acupuncture, in which needles are inserted into specific "acupuncture points" that are said to be located throughout the body. When performed properly it is claimed that this rebalances and stimulates the body's pattern of life energy, restoring

health and equilibrium in the patient.

Belief in chi is not limited to China, however. The concept exists in many countries and goes by many names, such as prana in India and ki in Japan. Franz Anton Mesmer called it animal magnetism, and to philosopher Henri Bergson it was the *élan vital* (vital force). Many alternative health practices employ the concept of a vital life-energy (or in modern parlance, bio-energetic fields) as the cornerstone of their belief systems.

Chiropractic, developed by Daniel David Palmer in 1895, is entirely based on the vitalistic, chi-like belief that an energy or spiritual life-force pervades the human body. This energy, referred to as "innate-intelligence," is said to emanate from the brain, travel through the spinal cord and peripheral nerves to all the organs of the body (Novella '97). It is only when this energy is intact and its flow is unimpeded that we can attain a healthy state. The primary culprit of illness is seen as spinal misalignments or subluxations that impinge spinal nerves and obstruct the flow of energy resulting in disease. Manipulating and correcting the subluxations is said to restore the flow of innate intelligence, creating a state of optimum health.

Therapeutic Touch, developed in the early 1970's by Dr. Dolores Krieger, is a relative newcomer to the "life-energy" belief system cavalcade. There are, however, key similarities between it and its older brethren. Therapeutic Touch (TT) posits that there is a human energy field (HEF) that surrounds human bodies and that illness or injury results in an unbalanced or depleted HEF (Turner). Treatment by TT Practitioners includes "centering" to align their field with the patient's, "unruffling" to smooth out the field and remove knots or blockages, and finally they perform an "energy transfer" to transmit some of their HEF to support and repair the patient's HEF.

Physical manipulation of the human energy field is a common concept in many alternative healing beliefs. In Andrew Weil's book, *Spontaneous Healing*, he comments; "...with practice you can learn to feel it move, move it about the body, and even transmit it to another body" (Weil, 1996). Using the hands as a sort of energy conduit is not particular to therapeutic

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Purpose

The Rational Examination Association of Lincoln Land is a non-profit, tax-exempt 501(c)(3) educational and scientific organization. It is dedicated to the development of rational thinking and the application of the scientific method toward claims of the paranormal and fringe-science phenomena.

REALL shall conduct research, convene meetings, publish a newsletter, and disseminate information to its members and the general public. Its primary geographic region of coverage is central Illinois.

REALL subscribes to the premise that the scientific method is the most reliable and self-correcting system for obtaining knowledge about the world and universe. REALL does not reject paranormal claims on *a priori* grounds, but rather is committed to objective, though critical, inquiry.

The REALL News is its official newsletter.

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From the Chairman

David Bloomberg

Last month's meeting provided some interesting ideas! Secretary/Treasurer Bob Ladendorf suggested a way for us to help each other and learn something in the process by having volunteers pick a skeptic-related topic and doing enough research for short articles that would appear in this newsletter. Editor Wally Hartshorn suggested that we provide more articles that are not necessarily aimed at the person who is already skeptical, but at the fence-sitter, the person who might be thinking about (for example) using chiropractic for his asthma but just isn't sure of the pros and cons.

We also had some good discussion on a number of topics, and I'd like to keep that going. This month, after the elections (always an event at least as exciting as the Bush/Gore vote), we will continue talking about the future of REALL, how we can get more involvement, and how we can reach more people. I encourage everybody to come. The meeting will be Tuesday, April 2, 7:00, at the Lincoln Library's Carnegie South Room. As I mentioned last month, if you would like to run, please let me know ahead of time so I can be prepared—this is especially the case if you won't be able to attend the actual meeting for some reason. E-mail me at chairman@reall.org. ♡

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touch alone. In China and Japan alone many alternative practices include this ability such as reiki, jin shin jyutsu, and juh-rei.

A quick perusal of the Internet yielded many websites that subscribe to a belief in harnessing the energy of the human body. For example, in "Master" Clyman's website (<http://www.chikung.com/>) he claims that by using his "Energy For Life Systems" one can "Never get sick. Never get tired" (Clyman, 2000). Strong similarities to many alternative health practices are evident in claims "...to remove energy blockages related to traumas and negative belief systems stored in the body." Clyman also claims to that his "healing Energy" can be transmitted from one to another.

The fast and loose usage of the word "energy" in all these alternative health care systems might sound compelling and authoritative, but what relationship does it have with the concept of energy as employed by modern physics?

Physics defines energy as the capacity for doing work (Williams, 1980). The concept is not merely fundamental; it is the unifying concept of physics. As such it has been deeply studied and the knowledge we have gained after centuries of investigation of the subject would fill many libraries. Much of what we call energy is subsumed under the umbrella term "mechanical energy." This consists of two broad classes called potential and kinetic energy. Potential energy is the energy of a stationary object solely due to its position in a gravitational field. Kinetic energy is the energy associated with movement. A boulder on a hill has a tremendous amount of potential energy and no kinetic energy. As it starts rolling down the hill the amount of potential energy decreases but the amount of kinetic energy increases. On smaller length scales these concepts go by different names but they are essentially the same. For example, thermal energy (or heat) consists of the microscopic movements of the constituents of a material. Thus, thermal energy is really kinetic energy in the form of heat. Similarly, chemical energy is the stored energy in chemical compounds. This makes it a form of potential energy in that chemical energy can be released from the compound under the right conditions. There are many types of energy, including electrical energy, radiant energy (light, x-rays, etc), nuclear energy, etc. Biological systems, however, clearly have a preference for chemical energy so it is here where we will delve a little deeper, looking for a possible source of the life energy espoused by many alternative health practices.

Living systems take energy from the environment and convert it into forms that they can use. For many decades it was believed that all life ultimately relied on photosynthesis. Plants create chemical energy from sunlight, animals eat the plants, and other animals eat these animals. This changed, however, when scientists discovered that certain organisms exist completely outside any influence from the sun and photosynthesis, instead relying on what is now called chemosynthesis. These chemosynthetic organisms derive energy from the chemicals released from ocean floor vents. We humans, however, are heterotrophs in that the food we ingest is derived from photosynthetic organisms and the animals that eat them. Blood circulation transports the sugars from these food sources to all the cells of our body. From within all our cells the sugars are then me-

tabolized and combined with the oxygen from the air we breathe to produce the energy we need to repair and maintain ourselves, the energy to live. Metabolism is the sum total of all chemical reactions within an organism. It consists of anabolic reactions in which complex molecules are synthesized and new cell protoplasm is created. It also consists of catabolic reactions during which molecules are broken down and energy is released. It is in this domain that the molecule ATP (adenosine triphosphate) reigns supreme. It doles out energy stored in the covalent (electron sharing) phosphate bonds for all catabolic and anabolic reactions in the human body. It is therefore this stored chemical energy that the body makes use of for all the significant processes associated with living matter and is the true energy of life.

Are there any other types of bio-energy that could assume the role of chi or the HEF? Adherents rarely mention specific details about this ephemeral energy but when they do they often talk about electromagnetism. It is true that special infrared cameras can pick up aura-like images surrounding human bodies. This is nothing more than the heat or infrared radiation that all humans emit in copious amounts. This thermal radiation is the end result of all the chemical reactions taking place in our bodies. Indeed, from one perspective, humans can be accurately described as heat producing engines since it is the form of energy we produce the most. It is not only living beings that produce this radiation, however. This heat energy, also called black body radiation, is emitted by all objects with a low albedo (reflectivity) and is caused by the random thermal movements of the charged particles contained in the object. Since all types of matter produce this radiation it cannot seriously be considered a candidate for a form of energy said to be specific to living systems alone.

Electromagnetic radiation at frequencies other than infrared are also emitted by human bodies and have often been cited as evidence for the elusive life-energy I have been discussing. Indeed, this radiation provides invaluable diagnostic information to mainstream medicine in the form of (for example) electroencephalographs (EEGs). This weak radiation, however, "shows no special characteristics that differentiate it from the electromagnetic waves produced by moving charges in any electronic system. Indeed, they can be simulated with a computer. No marker has been found that uniquely labels the waves from organisms 'live' rather than 'dead'" (Stenger 1999).

Some might be thinking now about Kirlian photography, which to this day is purported to show evidence of a human energy field vital to life. Discovered in 1939 by Semyon Kirlian, these photographs show a multicolored halo of light surrounding, reportedly, only living objects. These images are created by objects on a photographic plate, which are subjected to a high voltage electric field. Claims have even been made that these photographs produce full images of living objects that are missing parts such as a leaf torn in half. "This is not due to paranormal forces, however, but to residues left from the initial impression made by the whole leaf or to fraud" (Carroll, 2000). The photographs themselves, although genuine, are no mystery. The effect is called a corona discharge and was reported as far back as 1777. This well-understood phenomenon is affected by many variables (especially moisture) but living systems are not one of

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The Ventriloquist's War

by Richard Petraitis

Since the “First Servile War” of 139 to 131 B.C.E., when a rogue slave named Eunus used conjurer’s tricks to persuade a population in servitude to seize Sicily from Roman control, there has been no cessation in the employment of magic tricks by self-styled messiahs to draw recruits to their banners of rebellion. Eunus awed audiences by breathing fire, using a concealed nut shell in his mouth pierced at both ends and filled with a flammable substance, to spit flames and generate sparks. It was an impressive trick used to convince fellow rebels that the gods spoke through him alone – especially important since Eunus was renowned as a gifted medium. (The same trick was used by the Rabbi Bar Kochba, during the Jewish Revolt of 132 to 135 C.E. Bar Kochba convinced many Jews to join his rebel army with the “breath of fire ruse” used to demonstrate his sanction by the Divine.)¹ Both revolts failed, after initial military successes, ground down by the weight of Roman legions – their leaders’ supernatural powers notwithstanding. Centuries later, conjuring tricks continued to be the favorite tools of those leading the oppressed masses out of bondage.

The Talking Cross Revolt of the Nineteenth Century, by the Maya People, provides one such example of strategic legerdemain used in a revolutionary cause. During the late 1840s, the Maya People chafed under the rule of an oppressive Mexican government. They would readily rally behind any prophet who claimed special direction from God to lead them to freedom. The native inhabitants of the Yucatan found such a prophet to give life to a rebellion, actually an H-man, (Mayan for literally “He who knows”— a seer), named Manuel Nahuat.² Employed by the rebel leadership, Nahuat combined orthodox Christian beliefs with the supernatural beliefs of the Maya People. This particular H-man used the Mayan religious belief in “speaking idols” as a method to inspire Indian peasants to fight Mexico’s armies. Speaking idols had often convinced these indigenous folk of their invincibility and success in war.

Unknown to many Americans, the Maya have had a long history of speaking idols fanning the flames of resistance against invaders. As early as 1597, a Maya named Andres Chi announced himself as Moses returned to earth. He claimed to be channeling the Holy Spirit. Just how was the Holy Ghost being channeled by this oracle? Apparently, the Spirit used a boy hiding in the roof of Mr. Chi’s thatched hut to give disembodied messages to the peasants – a ruse soon uncovered by the ruling authorities. Andres Chi simply employed an ancient trick to generate divine voices via hidden priests speaking into temple hollows – always guaranteed to mystify!³ In 1846, during the Mexican-American War, a Mayan rebellion broke out in the Republic of Mexico. It was in Mexico’s Yucatan region where the long and bloody war known as the Caste War began against the ruling European elites (Ladinos). The forest Maya, allegedly led by the voice of God, battled republican troops. After two years of savage fighting, the rebels suffered severe setbacks and they retreated to forest shelters. One contingent of despondent Mayan guerillas fled to a jungle grotto considered holy ground; it was called “Little Holy Cross.” Mayan fighters found

a cross, some six inches across, carved on the trunk of a mahogany tree within the grotto confines. A rebel leader, Jose Maria Barrera, determined to use this religious belief to his military advantage, declared the area sacred. He soon built another cross on a platform of poles facing the grotto’s holy site. Mr. Barrera employed a famous H-man, Manuel Nahuat. The H-man made the crosses speak by using the shaman’s trick of ventriloquism, while hidden out of sight for maximum effect.⁴ Mayan fighters were soon being told, “by heavenly voices,” that the white man’s bullets wouldn’t harm them. The crosses also advised the rebels to launch an attack against a nearby white stronghold called Kampocolche. On Jan. 4th, 1851, Barrera’s fighters, armed mainly with machetes and a strong belief in the supernatural, attacked the Ladino stronghold. They were repulsed with heavy losses when the promised bullet immunity didn’t materialize.⁵ Several months later, Mexican forces surprised the rebels at the shrine of “Little Holy Cross.” Barrera escaped in the melee, but the talented H-man, Manuel Nahuat, was dragged out of hiding and killed. The sacred mahogany tree, looked upon as the World Tree by some Maya believers, was chopped down by soldiers.⁶ However, the exposure of this pious trick didn’t deter Mr. Jose Barrera. The Maya commander quickly built three more talking crosses carved from pieces of the original mahogany tree.⁷ These crosses couldn’t speak in the usual disembodied manner to the fighters, allegedly because of the defilement of the sacred grotto. The holy Crosses communicated messages from God, via an interpreter. Dictated letters, signed by the Talking Crosses, were read to all cult followers.⁸ The Mayan rebels gained heart and moved to the offensive, capturing much territory from the Ladinos.

Despite fresh victories, Jose Barrera knew he had to fill the spiritual void created by the execution of Manuel Nahuat. He hoped to keep the warriors of the Talking Crosses (named Cruzob) from disbanding. After the sack of the second shrine by the Mexican army, Barrera built a thatched church at a nearby Mayan town, complete with a hidden room called “La Gloria.” It was in this room that the Talking Crosses were guarded, placed upon an altar for veneration. A new method of ventriloquism was now used by the rebel commander. A pit was dug behind the altar deep enough to conceal a large barrel. A man would then conceal himself in the barrel and it was this man, the shrine’s assistant, who became the mouthpiece for the Talking Crosses. The assistant used the barrel’s echo chamber to produce voices that seemed to come out of the air – startling the believers gathered in the church.⁸ Worshipers weren’t allowed inside “La Gloria,” but were made to keep a respectful distance from the altar area. It was in this manner that the Talking Crosses inspired the Mayan rebels again!

The Caste War progressed well for the Mayan fighters and several Mexican armies were defeated. The Maya People carved out an independent city state in the Quintana Roo area of the Yucatan. A no man’s land was formed between Mexican territory, controlled by the Ladinos, and the realm of the Talking Cross Maya. The Cruzob rebels established No Cah Santa Cruz Balam Na as their new capital. The three Talking Crosses

were given a new home in a magnificent stone church called the Holy Cross Jaguar House. This massive church was a hundred feet long by sixty feet wide.⁹ In 1868, the success of the Talking Cross Revolt inspired other Native American ventriloquists. A Maya peasant and ventriloquist, Pedro Diaz Cuscat, carved a wooden saint (“a talking statue”) which he claimed had come down from heaven. Cuscat placed the wooden effigy in a large chest to shield it from worldly eyes. The chest was large enough to hold both the wooden saint and its Maya guardian within an inner compartment. Soon the chest was speaking to the locals, with a very human voice, about ill portents and war. Confiscation of the chest by Church authorities only led the industrious Cuscat to create several more chests. He claimed these chests weren’t made by hand but born to an assistant, Augustina Checheb, making her “God’s Mother.”¹⁰ The flames of revolt were fanned throughout the Chiapas region. Three green stones were said to have fallen from the sky. It was a divine sign. Cuscat’s assistant recovered the stones and wrapped them in linen. Soon these inanimate objects were reputedly prophesizing.¹¹ Checheb’s twelve-year-old son was hideously crucified as a sacrifice to God and the province exploded in open revolt.¹² San Cristobal, the royal city, was stormed by Chiapan rebels, but they weren’t able to hold out against Mexican regulars. After the city was recaptured, the bodies of revolutionaries and prophets were left rotting in the plaza – a reminder of the price of rebellion.¹³

The Chiapas conflict had no effect on the Maya of the Quintana Roo. Jose Barrera died, almost without notice, in 1852. The Maya People’s autonomous state would endure for another fifty years. Some of the Maya leadership even sought admission into the British Empire. In 1861, English emissaries to the Maya capital were roughly treated and taken to the Holy Temple of the Talking Crosses, equipped with the now standard sound chamber. It was there they heard God’s voice ask them for a thousand barrels of gunpowder, as they were forced to kneel before the Holy Altar.¹⁴ The emissaries were astonished by such a strange request from the Divine. It didn’t bode well for any Mayan plans to become British subjects. Later, the Talking Crosses began a vigorous correspondence, via dictated letters, with the British colonies of South America. As the years went by, inner strife greatly weakened the Cruzob warriors, particularly the unity of the tribal chiefs. In 1900, the Mexican federal government sent a large army, under the command of General Ignacio Bravo, to conquer the now disunited Talking Cross Maya. Machine guns and modern armaments, were arrayed against Mayan soldiers ill equipped for battle with their antique, muzzle-loading rifles. Diseases introduced by Federal troops further cut down the fighting strength of native soldiers.¹⁵ No amount of supernatural assistance to the Cruzob fighters could stop the advance of General Bravo. A railroad was laid down through the heart of Mayan territory and the capital was stormed by Mexican soldiers. In 1901, the Talking Cross Maya ceased to exist as an independent people. The Quintana Roo became the site of logging camps and a very large penal colony. Another divinely inspired war had reached bloody closure.

Notes

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14. Reed, Nelson, *The Caste War of Yucatan*, Stanford, CA, Stanford University Press, 1964, pp 181-183.
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them. I have seen beautiful kirlian images of a penny. Additionally, since a corona discharge requires that the electric charge ionizes the gas surrounding the photographed object, the colorful image naturally disappears when photographed in a partial vacuum. If, however, kirlian photography actually revealed a fundamental living energy field this would not be the case.

The common theme running through all the alternative health care systems I’ve discussed is a belief in a pervasive and mysterious energy that supports and maintains the processes associated with life. For pre-scientific cultures, living systems were a complete mystery and it is understandable that in their attempts to comprehend it they built a belief system around a magical form of energy to distinguish living from non-living. But now in the twenty-first century, the energy of life is no longer a mystery and has not been for many decades. There is still much to learn about biochemistry and physics, but our current knowledge is far beyond needing to resort to mysterious energies to explain why life is so different from non-life. If living systems required an unknown force or energy to exist, this would be such a Grand Canyon gaping hole in our understanding that biochemists would probably talk about little else. There are no experiments, observations, or even viable hypotheses that require the fundamental change in our conceptions that chi or the HEF would demand. No proponents of acupuncture, chiropractic, therapeutic touch, or any of the others have ever produced the proper double blind, placebo controlled, reproducible scientific evidence to support their energy claims. “The bioenergetic field plays no role in the theory or practice of biology or scientific medicine. Vitalism and bioenergetic fields remain hypotheses not required by the data, to be rejected by Occam’s razor until the data demand otherwise.” (Stenger, 1999)

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Evolution, Creation, and Science Education: Answers to Ten Common Questions

by Molleen Matsumura

The Scientific Issues

Why should evolution be taught in science classes?

Evolution should be taught for the same reason that other factual information should be taught. It is the best, most accurate explanation we have for the variety we see in the living world, resulting from the research and experimentation of thousands of scientists for over a century.

And, it is important. Children may not need to know what time of day George Washington was born, but they need to know he was our first president. In the same way, they may not need to know every detail of cell division, but they need to know about evolution because it is a key to understanding every aspect of the biological sciences, from genetics to animal behavior.

But what about equal time for other scientific viewpoints, like scientific creationism?

Sometimes, scientists really do disagree about the explanation for some natural phenomenon. And sometimes, it is appropriate to present children with different viewpoints, and the evidence for them. This can help children understand how science works, and what kind of evidence is needed to establish a scientific theory. But it can't always be done because there wouldn't be enough hours in the school day to teach children about every explanation that was ever given.

In any case, the fact is that "scientific creationism" is not a genuine scientific theory. It is an attempt to use scientific-sounding arguments to uphold a religious belief, the belief that the creation story told in the Bible is literally true. The scientific method starts with a question, like, "Why are some fossil animals so different from the animals around us today?" and finds the answer through observation and experiment. The creationist method starts with an answer, then looks for evidence that seems to fit. Another important difference is that science uses natural explanations of natural events. Scientists study natural processes occurring in the world around them, find out how they work, and apply the principles they learn to new questions. They never use miracles as explanations. "Scientific creationism" depends on miracles; its explanations assume that there have been exceptions to the laws of nature. This means that "scientific creationism" is unscientific by definition!

What about the flaws in the theory of evolution? If someone can show problems with this theory, doesn't that prove we should pay attention to creationism?

Finding a problem in one theory doesn't prove that another is correct. Suppose I ask you and your friend what kind of fruit I have in a paper bag. You guess that it's an apple, and your friend guesses that it's a cherry. Then I say, "I'll give you a

hint—there's one big seed in the center." I've just proved that you were wrong, but that doesn't make your friend right. It could be a peach or an apricot!

But the "flaws" that creationists claim to find in evolutionary theory simply don't exist. They are based on a misunderstanding of the theory, or misrepresentation of evidence. This is really a very complicated area, but one example might help. "Scientific" creationists often claim that evolutionary theory is disproved by a lack of transitional fossils—remains of plants or animals that are intermediate between modern species and the fossils we have found. Some plants and animals don't fossilize well; sometimes conditions for preserving fossils are poor; sometimes fossils are destroyed; and some fossils will never be found because they are inaccessible—located under-water or in deserts. But there is enough fossil evidence—not to mention transitional species living right now!—to establish a clear pattern. Suppose you saw the ruin of a house after a bombing—some standing door frames, a partially tumbled-down chimney, and so on. You would not need to see every bit of roof and wall to convince you that it was a house. You might not know what color the house was, just as we don't know what color a fossil mammoth was. But we know that some species of mammoths were the ancestors of modern elephants as surely as you would know that you were looking at a house and not a football stadium!

The Legal Issues

What do the courts say about the teaching of evolution and of scientific creationism?

In 1962, in the important case of *Epperson v Arkansas*, the Supreme Court ruled that states may not forbid the teaching of evolution. Then, in 1987, in the *Edwards v Aguillard* decision, the Court ruled that states may not require the teaching of "scientific creationism," because to do so would be to teach a religious doctrine, in violation of the First Amendment to the Constitution. The First Amendment forbids the government to do anything that inhibits or advances religion. According to the law, public schools may teach about religion; for example, a social studies teacher may tell students about the beliefs of the people in a country they are studying. But a teacher may not advocate a religion—that is, tell students they should adopt particular religious beliefs.

What About the Teacher's Freedom of Speech?

Outside of school, the teacher is as free to advocate religious beliefs as any other citizen. In school, these rights are limited by the teacher's professional responsibilities. Another Supreme Court decision, *Palmer v Board of Education*, says, "There is a compelling state interest in the choice and adherence to a suitable curriculum.... It cannot be left to individual teachers to teach what they please." The science teacher's responsibility is to teach the best known scientific knowledge.

This responsibility is affirmed by a number of teachers' organizations that also work to protect teachers' rights. Policy statements of twenty-one educational organizations may be found in the NCSE book *Voices for Evolution*.

What about the rights of parents to have their beliefs taught to their children?

Nobody denies the right of parents to teach their beliefs at home, or to have their children taught their beliefs in churches, summer camps, and so on. But the situation in the schools is more complicated. Schools have to teach children from a variety of religious and ethnic backgrounds, and teachers accomplish this by using a curriculum that avoids promoting or denying religious beliefs.

Teachers must meet curriculum requirements designed to assure that children learn what they will need to know. The schools couldn't function at all if they taught every belief of every parent. Some people believe that Shakespeare didn't write the plays he is known for, and have various theories about who did write them. Some people believe that the earth is a hollow ball, and others (including some creationists) believe that it is flat. The schools do their best to teach the most accurate information available.

But if a majority, or at least a very large number, of people wanted scientific creationism to be taught, wouldn't it be more democratic to do that?

The decision we have made in our democracy is to try to give all children the best education possible. We know that sometimes a great number of people have misconceptions. Sadly, large numbers of people don't know that the earth revolves around the sun, how electricity works, or what causes tides. Is it fair to the children to omit teaching things because a lot of people don't understand them, or to teach them something that isn't true, just because a lot of people believe it?

The Moral Issues

Doesn't the idea of evolution go against religion?

Not at all. Most religious groups have no problem whatever with the theory of evolution or other scientific findings. NCSE's book *Voices for Evolution* contains statements from thirteen major religious organizations, explaining why their faith is not harmed by the idea of evolution. In fact, many feel that a deeper understanding of nature's wonders actually enriches their faith.

Doesn't teaching evolution destroy morals by telling children it's okay to act like animals?

According to the theory of evolution, humans are animals, but why would that imply we should act like them? We share structural and chemical traits with many animals, but humans act like humans. Besides, which animals are we talking about? Every pet owner knows that dogs behave differently from cats. Every rancher knows that cattle and sheep behave differently from each other, and very differently from mountain lions. People also have innate behaviors. What is special about human beings is that we don't act only on instinct. Each new genera-

tion must be taught how to behave morally. The older generations develop codes of manners and morals, and pass laws, enforce them, and teach the children to obey them. Understanding evolution reinforces the message that all people are important parts of the web of life, and each person is unique and valuable.

Isn't it true that, by teaching "survival of the fittest," evolution is used to justify cruelty?

No. Some people did have this mistaken idea in the late nineteenth century, when a philosophy called "Social Darwinism" resulted from a misguided effort to apply the lessons of biological evolution to society. They taught that colonized nations, or poor people and disadvantaged minorities within one country, must deserve their situations because they were "less fit" than those who were better off.

The fact is that the idea of biological evolution has stood the test of time, but "Social Darwinism" has not. Former colonies are now independent nations, democracy is spreading, and belief in individual equality has grown. This process has actually been helped by what we have learned about evolution. We now know that "fitness" means more than just brute strength. For many kinds of animals, and certainly for humans, cooperation and kindness help the survival of individuals and of groups.

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(*"Energy Crisis" continued from page 5*)

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Our Next Meeting

Elections and Roundtable Discussion

This month, after we hold our annual elections (always an event at least as exciting as the Bush/Gore vote), we will continue talking about the future of REALL, how we can get more involvement, and how we can reach more people.



Springfield, Illinois
Lincoln Library (7th & Capitol)
Tuesday, April 2, 7:00 PM

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