

The Eco-Economic Revolution Part II

By Lester R. Brown

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Restructuring the Economy

We can now see what an eco-economy looks like. Instead of running on fossil fuels, it will be powered by renewable sources of energy, such as wind and sunlight, and by geothermal energy from within the earth. It will be hydrogen-based instead of carbon-based. Cars and buses will run on fuel-cell engines powered by electricity produced with an electrochemical process using hydrogen as the fuel instead of internal combustion engines. With fuel cells powered by hydrogen, there is no climate disrupting carbon dioxide or health-damaging pollutants; only water is emitted.

In the new economy, atmospheric carbon dioxide levels will be stable. In contrast to today's energy economy, where the world's reserves of oil and coal are concentrated in a handful of countries, energy sources in the eco-economy will be widely dispersed - as widely distributed as sunlight and wind. The world's heavy dependence on the Middle East for much of its energy will likely decline as the new climate benign energy sources and fuel-cell engines take over.

The energy economy will be essentially a solar/hydrogen economy with various energy sources deriving from the sun used either directly for heating and cooling or indirectly to produce electricity. Wind-generated electricity, which is likely to be the lowest-cost source of energy, will be used to electrolyze water, producing hydrogen. This provides a means of both storing and transporting wind energy. Initially, existing natural gas pipelines will be used to distribute hydrogen. But over the longer term, both natural gas and oil pipeline networks can be adapted to carry hydrogen as the world shifts from a carbon-based to a hydrogen-based economy.

The transport systems of cities have already begun to change. Instead of the noisy, congested, polluting, auto-centered transport systems of today, cities will have rail-centered transport systems, and they will be bicycle- and pedestrian-friendly, offering more mobility, more exercise, cleaner air, and less frustration.

Urban transport systems will have the same components as

Executive Trivia Question...

Who started the Academy Awards?
Why is it called an "Oscar"?
Why is it so important?

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they do today: automobile, rail, bus, and bicycle. The difference will be in the mix. As more city planners recognize the inherent conflict between the automobile and the city, cleaner and more efficient transport systems will develop. Urban personal mobility will increase as automobile use and traffic congestion decline.

The materials sector of the eco-economy will look far different, too, as it shifts from the linear economic model, where materials go from the mine or forest to the landfill, to the reuse/recycle model, yielding no waste and nothing for the landfills.

One of the keys to reversing the deforestation of the earth is paper recycling; the potential here has been only partly realized. A second key is developing alternative energy sources that will reduce the amount of wood used as fuel. In addition, boosting the efficiency of wood burning can measurably lighten the load on forests.

Another promising option is the use of carefully designed, ecologically managed, and highly productive tree plantations. A small area devoted to plantations may be essential to protecting forests at the global level. Plantations can yield several times as much wood per hectare as can a natural forest.

In the economy of the future, the use of water will be in balance with supply. Water tables will be stable, not falling. The economic restructuring will be designed to raise water productivity in every facet of economic activity.

In this environmentally sustainable economy, harvests from oceanic fisheries, a major source of animal protein in the human diet, will be reduced to the sustainable yield. Additional demand will be satisfied by fish farming. This is, in effect, an aquatic version of the same shift that occurred during the transition from hunting and gathering to farming. The freshwater, herbivorous carp poly-culture on which the Chinese rely heavily for their vast production of farmed fish offers an ecological model for the rest of the world.

A somewhat similar situation exists for rangelands. One of the keys to alle-

viating the excessive pressure on rangelands is to feed livestock the crop residues that are otherwise being burned for fuel or for disposal. This trend, already well under way in India and China, may hold the key to stabilizing the world's rangelands.

And finally, the new economy will have a stable population. Over the longer term, the only sustainable society is one in which couples have an average of two children.

Creating New Industries

Describing the eco-economy is obviously a somewhat speculative undertaking. In the end, however, it is not as open ended as it might seem, because the eco-economy's broad outlines are defined by the principles of ecology.

What is not so clear is how ecological principles will translate into economic design. For example, each country has a unique combination of renewable energy sources that will power its economy. Some countries may draw broadly on all their renewable energy sources, while others may concentrate heavily on one that is particularly abundant, such as wind or solar energy. A country with a wealth of geothermal energy may choose to structure its energy economy around this subterranean energy source.

Building a new economy involves phasing out old industries, restructuring existing ones, and creating new ones. World coal use is already being phased out, dropping 7% since peaking in 1996. It is being replaced by efficiency gains in some countries, by natural gas in others (such as the United Kingdom and China), and by wind power in others (such as Denmark).

The automobile industry faces a major restructuring as it changes power sources, shifting from the gasoline-powered internal combustion engine to the hydrogen-powered fuel-cell engine. This shift will require both a retooling of engine plants and the retraining of automotive engineers and automobile mechanics.

The new economy will also bring major new industries, ones that either do not yet exist or that are just beginning. Wind electricity generation is one such industry. Now in its embryonic stage, it promises to become the found-

ation of the new energy economy. Millions of turbines soon will be converting wind into electricity. In many countries, wind will supply both electricity and, through the electrolysis of water, hydrogen. Together, electricity and hydrogen can meet all the energy needs of a modern society.

In effect, there will be three new subsidiary industries associated with wind power: turbine manufacturing, installation, and maintenance. Manufacturing facilities will be found in scores of countries, industrial and developing. Installation, which is basically a construction industry, will be more local in nature. Maintenance, since it is a day-to-day activity, will be a source of ongoing local employment.

The robustness of the wind turbine industry was evident in 2000 and 2001 when high-tech stocks were in a free fall worldwide. While high-tech firms as a group were performing poorly, sales of wind turbines were climbing, pushing the earnings of turbine manufacturers to the top of the charts. Continuing growth of this sector is expected for the next few decades.

As wind power emerges as a low-cost source of electricity and a mainstream energy source, it will spawn another industry - hydrogen production. Once wind turbines are in wide use, there will be a large, unused capacity during the night when the demand for electricity drops. With this essentially free electricity, turbine owners can turn on the hydrogen generators and convert the wind power into hydrogen, ideal for fuel-cell engines. Hydrogen generators will start to replace oil refineries. The wind turbine will replace both the coal mine and the oil well. Both wind turbines and hydrogen generators will be widely dispersed as countries take advantage of local wind resources.

Changes in the world food economy will also be substantial. Some of these, such as the shift to fish farming, are already under way. The fastest-growing sub-sector of the world food economy during the 1990s was aquaculture, expanding at more than 11% a year. Fish farming is likely to continue to expand simply because of its efficiency in converting grain into animal

protein.

Even allowing for slower future growth in aquaculture, fish farm output will likely overtake beef production before 2010. Perhaps more surprising, fish farming could eventually exceed the oceanic fish catch. Indeed, for China - the world's leading consumer of seafood - fish farming already supplies two-thirds of the seafood, while the oceanic catch accounts for the other third. With this development, new jobs will be created: aquatic ecologist, fish nutritionist, and marine veterinarian.

Another growth industry of the future is bicycle manufacturing and servicing. Because the bicycle is non-polluting, frugal in its use of land, and provides the exercise much needed in sedentary societies, future reliance on it is expected to grow. As recently as 1965, the production of cars and bikes was essentially the same, but today more than twice as many bikes as cars are manufactured each year. Among industrial countries, the urban transport model being pioneered in the Netherlands and Denmark, where bikes are featured prominently, gives a sense of the bicycle's future role worldwide.

As bicycle use expands, interest in electrically assisted bikes is also growing. These bikes are similar to existing bicycles, except for a tiny battery-powered electric motor that can either power the bicycle entirely or assist elderly riders or those living in hilly terrain, and their soaring sales are expected to continue climbing in the years ahead.

Just as the last half century has been devoted to raising land productivity, the next half century will be focused on another growth industry: raising water productivity. Virtually all societies will be turning to the management of water at the watershed level in order to manage available supply most efficiently. Irrigation technologies will become more efficient. Urban wastewater recycling will become common. At present, water tends to flow into and out of cities, carrying waste with it. In the future, water will be used over and over, never discharged. Since water does not wear out, there is no limit to how long it can be used, as long as it is purified before reuse.

Another industry that will play a prominent role in the new economy is teleconferencing. Increasingly for environmental reasons and to save time, individuals will be "attending" conferences electronically with both audio and visual connections. This industry involves developing the electronic global infrastructure, as well as the services, to make teleconferencing possible. One day there may be thousands of firms organizing electronic conferences.

New Jobs in the Eco-Economy

Restructuring the global economy will create not only new industries, but also new jobs - indeed, whole new professions and new specialties within professions. For example, as wind becomes an increasingly prominent energy source, thousands of wind meteorologists will be needed to analyze potential wind sites, monitor wind speeds, and select the best sites for wind farms. The better the data on wind resources, the more efficient the industry will become.

Wind engineers will be hired to design customized wind turbines. The appropriate turbine size and design can vary widely according to site. It will be the job of wind engineers to tailor designs to specific wind regimes in order to maximize electricity generation.

Environmental architecture is another fast-growing profession. Among the signposts of an environmentally sustainable economy are buildings that are in harmony with the environment. Environmental architects design buildings that are energy- and materials-efficient and that maximize natural heating, cooling, and lighting. In a future of water scarcity, water-shed hydrologists will be in demand. It will be their responsibility to understand the hydrological cycle, including the movement of underground water, and to know the depth of aquifers and determine their sustainable yield. They will be at the center of watershed management regimes.

As the world shifts from a throw-away economy, engineers will be needed to design products that can be recycled - from cars to computers. Once products are designed to be disassembled

quickly and easily into component parts and materials, comprehensive recycling is relatively easy.

Technologies used in recycling are sometimes quite different from those used in producing from virgin raw materials. Within the U.S. steel industry, for example, where nearly 60% of all steel is produced from scrap, the technologies used differ depending on the feedstock. Steel manufactured in electric arc furnaces from scrap uses far less energy than traditional open-hearth furnaces using pig iron. Recycling engineers will be responsible for closing the materials loop, converting the linear flow-through economy into a comprehensive recycling economy.

In countries with a wealth of geothermal energy, it will be up to geothermal geologists to locate the best sites either for supplying power plants or for tapping directly to heat buildings. Retraining petroleum geologists to master geothermal technologies is one way of satisfying the likely surge in demand for geothermal geologists.

If the world is to stabilize population sooner rather than later, it will need far more family-planning midwives in Third World communities. This growth sector will be concentrated largely in developing countries, where millions of women lack access to family planning. The same family-planning counselors who advise on reproductive health and contraceptive use can also play a central role in controlling the spread of HIV.

Another pressing need, particularly in developing countries, is for sanitation-system engineers who can design sewage systems not dependent on water, a trend that is already under way in some water-scarce countries. As it becomes clear that using water to wash waste away is a reckless use of a scarce resource, a new breed of sanitation engineers will be in wide demand. Washing waste away is even less acceptable today as marine ecosystems are overwhelmed by nutrient flows. Apart from the ecological disruption of a water-based disposal method, there are also much higher priorities in the use of water, such as drinking, bathing, and irrigation.

Yet another new specialty that is

likely to expand rapidly in agriculture as productive farmland becomes scarce is that of the agronomist who specializes in multiple cropping and intercropping. This position requires expertise both in the selection of crops that can fit together well in a tight rotation in various locales and in agricultural practices that facilitate multiple cropping.

Investing in the Environmental Revolution

Restructuring the global economy so that economic progress can be sustained represents the greatest investment opportunity in history. The Agricultural Revolution involved restructuring the food economy, shifting from a nomadic lifestyle based on hunting and gathering to a settled lifestyle based on tilling the soil. Although agriculture started as a supplement to hunting and gathering, it eventually replaced these practices almost entirely. The Agricultural Revolution entailed clearing one-tenth of the earth's land surface of either grass or trees so it could be plowed. Unlike the hunter-gatherer culture that had little effect on the earth, this new farming culture literally transformed the surface of the earth. The Industrial Revolution has been under way for two centuries, although in some countries it is still in its early stages. At its foundation was a shift in sources of energy from wood to fossil fuels, a shift that set the stage for a massive expansion in economic activity. Indeed, its distinguishing feature is the harnessing of vast amounts of fossil energy for economic purposes. While the Agricultural Revolution transformed the earth's surface, the Industrial Revolution is transforming the earth's atmosphere.

The additional productivity that the Industrial Revolution made possible unleashed enormous creative energies. It also gave birth to new lifestyles and to the most environmentally destructive era in human history, setting the world firmly on a course of eventual economic decline. The Environmental Revolution resembles the Industrial Revolution in that each is dependent on the shift to a new energy source. And like both earlier revolutions, the Environmental Revolution will affect

the entire world.

There are differences in scale, timing, and origin among the three revolutions. Unlike the other two, the Environmental Revolution must be compressed into a matter of decades. And while the other revolutions were driven by new discoveries and advances in technology, this revolution is being driven more by our instinct for survival.

There has not been an investment situation like this before. The amount that the world spends now each year on oil, the leading source of energy, provides some insight into how much it could spend on energy in the eco-economy. In 2000, the world used nearly 28 billion barrels of oil, some 76 million barrels per day. At \$27 a barrel, the total comes to \$756 billion per year. How many wind turbines, solar rooftops, and geothermal wells will it take to produce this much energy?

One big difference between the investments in fossil fuels and those in wind power, solar cells, and geothermal energy is that the latter will supply energy in perpetuity. These "wells" will not run dry. If the money spent on oil in one year were invested in wind turbines, the electricity generated would be enough to meet one-fifth of the world's needs.

Investments in the infrastructure for the new energy economy, which would eventually have to be made as fossil fuels are depleted, will obviously be huge. These include the transmission lines that connect wind farms with electricity consumers and the pipelines that link hydrogen supply sources with end users. Much of the infrastructure for the existing energy economy - the transmission lines for electricity and the pipelines for natural gas - can be used in the new energy economy as well. The local pipeline distribution network in various cities for natural gas can easily be converted to hydrogen.

For developing countries, the new energy sources promise to reduce dependence on imported oil, freeing up capital for investment in domestic energy sources. Although few countries have their own oil fields, all have wind

and solar energy. In terms of economic expansion and job generation, these new energy technologies are a godsend.

Investments in energy efficiency are also likely to grow rapidly simply because they are so profitable. In virtually all countries, industrial and developing, saved energy is the cheapest source of new energy. Replacing inefficient incandescent light bulbs with highly efficient compact fluorescent lamps offers a rate of return that stock markets are unlikely to match.

There are also abundant investment opportunities in the food economy. It is likely that the world demand for seafood, for example, will increase at least by half over the next 50 years, and perhaps much more. If so, fish-farming output - now 31 million tons a year - will roughly need to triple, as will investments in fish farming. Although aquaculture's growth is likely to slow from the 11% a year of the last decade, it is nonetheless likely to be robust, presenting a promising opportunity for future investment.

A similar situation exists for tree plantations. At present, tree plantations cover some 113 million hectares (280 million acres). An expansion of these by at least half, along with a continuing rise in productivity, is likely to be needed both to satisfy future demand and to eliminate one of the pressures that are shrinking forests. This, too, presents a huge opportunity for investment. No sector of the global economy will be untouched by the Environmental Revolution. In this new economy, some companies will be winners and some will be losers. Those who anticipate the emerging eco-economy and plan for it will be the winners. Those who cling to the past risk becoming part of it.

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The Idea Incubator

by Frank Helton

How can analyze terrorists?

Test their urine. The urine of suspected terrorists could tell authorities whether Osama bin Laden has been working on nuclear weapons. A San Francisco Bay area research facility has created an extremely sensitive test that can detect tiny traces of plutonium - a key ingredient of nuclear weapons - in bodily fluids. Terrorists working in low-tech cave laboratories are not likely to be protecting themselves from nuclear contamination, say scientists at the Lawrence Livermore Lab. "If you inhale [plutonium], it will eventually get in your bone, get into your liver," and remain in your body forever, environmental chemist *John Knezovich* told ABC News. Aboveground atomic tests have left a little bit of plutonium in all of us, but people handling the substance would have much more. The new urine test detects plutonium exposure as far back as 20 years, and is 100 times more sensitive than any existing test.

Collect their genes. The FBI has proposed creating a DNA database that could help authorities identify and track terrorists. So far, authorities have found it impossible to identify most of the 300 suspected al Qaida terrorists being held at Camp X-Ray at Guantanamo Bay, Cuba, and the more than 7,500 prisoners in detention camps in Afghanistan. These prisoners have no identity papers, and many use aliases.

We don't know who these guys are, and we need to find out. The FBI has asked for permission to begin using blood samples to create a database to help identify these men, and to see if they are connected to other crimes. Investigators say they discovered two human hairs in a detonating device found in shoe bomber Richard Reid's shoes; DNA analysis could help them track accomplices in his attempt to blow up a transatlantic flight. Federal law currently limits DNA profiling to convicted sex offenders, violent felons, and missing persons, and to testing evidence from crime scenes. To expand the list to suspected terrorists, the FBI needs congressional approval.

How can robotic dragonflies explore Mars?

Robotic dragonflies could soon be buzzing around the hostile terrain of Mars. Air on the Red Planet is ultrathin, rendering conventional aircraft nearly useless. Planes would need to travel faster than 250 miles per hour just to stay aloft, making it tough for them to touch down to collect data. Entomopters, however, are designed to fly more like insects than like planes. Launched from a Martian land rover, they could wing their way around collecting samples, and return to the rover to upload data and refuel. When bugs fly, the movement of their wings creates tiny vortices above

each wing's edge, giving it extra lift. *Rob Michelson* of Georgia Tech and *Tony Colozza* of Ohio Aerospace Institute used that information to design the wings of their Entomopters. The NASA funded engineers hope to see their insect-inspired robot on Mars before 2010.

How can we make mobile phones truly mobile?

Cell phone users will soon be able to power their mobiles with nothing but elbow grease. Designed for telephone talkers on the go, the handheld device created by Motorola and Freeplay of London uses no electricity. It consists of an 11-ounce wind-up generator and a cord that attaches to a phone. When your mobile goes dead far from civilization, a mere minute of handcranking will provide enough power for a ten-minute phone call. "This Is truly the first time a portable phone is truly portable," *Rory Stear*, chairman and CEO of Freeplay. The FreeCharge generator also contains an internal battery that can store extra energy, either from a wall socket or from the movements of your wrist. The device could be particularly handy in places like sub-Saharan Africa, where electricity is limited and cell phone use is on the rise. FreeCharge became available in March for about \$70.

The Idea Incubator... Cont.

by Frank Helton

How can we “code” people?

A Florida family has volunteered to have computer chips implanted in their bodies. *Jeffrey and Leslie Jacobs* and son *Derek* of Boca Raton will be the first test subjects for a device called the VeriChip. Just a little larger than a grain of rice, a chip is engraved with information about the person's identity and medical background. That could be particularly use for people like Jeffrey Jacobs, a cancer survivor who takes several types of medication. Emergency-room doctors could instantly access his medical information simply by scanning his chip. It could speak for a patient if they didn't have one. Created by Applied Digital Solutions, VeriChip is injected into the arm. "No body fluids can get in, a nothing could be loosened or come out", says Dr. Richard Seelig, the company's medical-applications director. Eventual the chip could be used to track down kidnap victims or lost Alzheimer's patients. Civil libertarians worry it could be the first step in "coding" people like a FedEx package, so they could always be tracked.

How can “smart cards” at Starbucks save time?

Last Year Starbucks was feeling jinxed by its own success. Long lines of caffeine cravers were scaring off new customers. So it came up with a swipeable smart card that cut time spent paying from 20 seconds to four.

Starbucks didn't know how customers would respond and had low expectations. In fact, when it launched the card in November it didn't even advertise.

But Starbucks cards have been a runaway success. In the first two months, customers bought 2.3 million of them, valued between \$5 and \$500, totaling \$32 million. Those numbers have been growing steadily ever since.

For Starbucks, the benefits are many: advance sales, interest earned on the money, and detailed data on customers' coffee-buying habits. "The Starbucks card is the most significant new product since Frappuccino," boasts Starbucks Chairman *Howard Schultz*. Soon java junkies will be able to use the card to order by cell phone or online and have drinks ready when they arrive, eliminating wait time altogether. The goal - now that Starbucks has gone a long way toward speeding payment - is to not deter a single hurried commuter.

How can drugs stop liver damage?

A new drug may completely reverse alcohol damage to the liver, says a Swedish pharmaceutical company. Rats injected with ethanol, the intoxicating agent in alcohol, and the drug Ceplene suffered no liver damage, while rats injected with just ethanol developed symptoms of alcohol abuse. "We've shown we could completely reverse the damage made by the alcohol," says *Kurt Gehlsen*, chief

scientific officer of Maxim Pharmaceuticals. The company expects clinical testing of Ceplene against alcohol-related liver disease to start this year. One out of 10 Americans suffer from chronic liver diseases such as cirrhosis and fatty liver.

How can a human uterus be transplanted?

Doctors in Saudi Arabia successfully performed the world's first human uterus transplant, which produced two menstrual periods before it failed. The womb had to be removed from the recipient, a 26-year-old woman, after 99 days, when a blood vessel supplying the uterus developed a clot, which cut off the blood supply. *Dr. Wafa Fageeh* of Abdulaziz University, who performed the transplant at King Fahad Hospital and Research Centre in Jiddah, called the operation "a good start." Many other scientists remain skeptical of the procedure's merits, calling it medically and ethically unsound. "A transplant to save a life is an acceptable risk, but not one for fertility, where there are alternatives," says *Roger Gosden*, a fertility expert at Eastern Virginia Medical School. "This is why we would never be given ethical clearance to try this in the United States." Uterus transplants were explored in the 1950s, but 20 years of failed experiments on animals convinced many scientists they were not feasible.

Kids Ask the Hardest Questions

by Thomas E. Ollerman, Ph.D.

Do all insects have compound eyes? Do insects perceive color?

Virtually all adult insects have compound eyes, each an intricate mosaic of thousands of hexagon-shaped lenses. But they do not see a confusion of multiple images. According to one widely held theory of insect vision, each facet of the compound eye contributes a tiny piece of what the insect sees, much like how the tiles in a mosaic form a complete picture. Compound eyes tend to be particularly sensitive to colors in the blue-green range and the ultraviolet, but only a few insects can discern red. As many flowers reflect ultraviolet light (invisible to the human eye), two separate blossoms, each of which appears white to us, may look markedly different to a butterfly or bee.

Caterpillars, maggots, and most other larvae, or mature forms of insects, see the world through single-lens eyes called stemmata that do little more than detect light. They enable the larva to discern light from shadow, an important ability for creatures whose survival depends on climbing up plants (toward light) or digging down into the soil (away from light). A few adult insects (such as certain worker ants) remain blind all their lives.

Why do rosebushes have thorns?

First, biologists distinguish a rose's "prickles" from true thorns such as those of a cactus or hawthorn. True thorns, which are modified leaf structures, clearly serve as defense mechanisms. The purpose of a rose's prickles is not so clear-cut. Some believe that

their primary purpose is to trap moisture close to the stem, and in that way help supply water to the plant. No doubt the prickles also discourage hungry animals from eating the leaves and flowers or from trampling the bushes. But as many rose growers know, rabbits and deer are not so easily discouraged.

As for thornless roses, nature has produced at least one such variety: the white Banksian rose, *Rosa banksiae*, a native of China. Since the 19th century, horticulturists have bred several more varieties with smooth stems. One of the first, and still most popular, is the Old Garden Rose known as Zephirine Drouhin. In recent years, a California rose breeder has produced a series of nearly thornless roses.

How do electric eels generate electricity?

In reality, all animals produce electricity. That's how nerve and muscle cells communicate with one another - by sending and receiving tiny ripples of electric current. The electric eel (*Electrophorus electricus*) produces its high-voltage zap with a long chain of special cells adapted from ordinary muscle cells. A single one of these electrocyte cells discharges only 80 millivolts of electricity (not enough to make your skin prickle). But line up 6,000 of these electric cells in the tail end of an 8-foot (2.5 meter) long electric eel, and you can get a truly stunning 600-volt ZAP. That's about five times the voltage that comes out of a standard wall socket, and more than enough to kill a small animal or stun a person.

The real trick, according to ichthyologists (fish scientists), is the electric eel's ability to dis-

charge all of its electricity-generating cells at the same instant, an ability it shares with about 500 other species of electric fish, including electric rays and electric catfish. However, no fish comes close to producing the high-voltage stun of *E. electricus*. Still, despite many stories, experts doubt whether a single eel, even a big one, could kill a person.

By the way, the electric eel is not a true eel at all, but a member of the freshwater tropical-fish family known as knifefishes.

Are most land animals shy of water?

Some animals are more adapted to water than others, but none could be said to be literally "shy" of it. For instance, aquatic mammals such as dolphins and seals have the ultimate adaptation to spending time in water - flippers. Semi-aquatic animals such as beavers and muskrats have webbed feet. But even terrestrial animals such as the horse, - with its hooves adapted for running - will not hesitate to swim across an ocean inlet.

More to the point, any animal entering the water, even for a "dip," probably has some reason for doing so. Since salt water doesn't quench thirst, coastal mammals would be entering the water for other reasons - such as foraging for food, escaping danger, or perhaps cooling off on a hot day. Raccoons and rats often feast on crabs and other shellfish in tidal pools and other shallow coastal waters. The wild horses of the Carolina barrier islands often enter the surf on hot days and are sometimes herded through the water during annual roundups.

The Miniature Earth

From: Allyson Lucca

If we could turn the earth's population into a community of 100 people, keeping the same proportions as we have nowadays, it would look like this:

61 Asians
12 Europeans
13 Africans
14 Americans (from North and South America)
50 Men and 50 Women
26 are White
74 are not White
33 are Christian
67 are not Christian
6 people own 59% of the whole community wealth
80 people live in poverty
14 people can't read
33 people die of famine
7 people have a higher education
8 people own a computer

- If you have never seen a relative die in war, If you have never been tortured, If you have never been a slave, You are luckier than 500 million people on earth.
- If you have food in a refrigerator, If you have clothes in a closet, If you have a roof over your head, If you have a bed, You are richer than 75% of the world's population.
- If you have a bank account, You are part of the 8% of the wealthiest people in the world.
- If you can read these words, You are luckier than 1 billion people who cannot read at all.

The original version of the "Global Community" was first printed in 1990 by Donnell Meadows. She died on February 21, 2001.

It is difficult to know exact numbers, so it is important that you know these figures represent trends, not precise statistics. These statistics came from Unicef: Zero Population Growth. If you would like to know about new initiatives, send your email address to lucca@luccaco.com

Thought to Ponder...

The truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.

Arthur Schopenhauer

Executive Trivia Answer...

The Academy Awards was founded by Louis B. Mayer in 1927 as a way to improve the studios leverage over unions. Awards were first handed out in a five-minute ceremony in 1929. Officially called the Academy Award of Merit, Oscar supposedly got its name when an Academy librarian who took one look at the statuette and exclaimed, "Gee. He looks just like my Uncle Oscar".

Oscars make it easier to attract big names to future projects. But the bottom line: A nomination for a small film can double its box office take, A best picture award often means an additional \$30 million, and slapping the word "winner" on a video is worth years of rentals.