



# the LEDGER

## Economic Education Newsletter

### Energy... All In A Day's Work

Did I remember to switch off the lights?

Should I drive to the corner store, or save energy by walking?

Will there be enough energy this winter so that our schools and factories can maintain their usual schedules?

Is there enough energy to meet our needs and, if not, are there any energy sources that could be used as practical alternatives?

No doubt these questions are familiar. Energy is an urgent issue today. If the industries and households in the United States were to rely only on our dwindling stock of gas and oil, the economy would be seriously affected. How? With less energy to run the machines of industry, the production of goods would decrease. In turn, many energy-intensive household activities would become expensive luxuries. Only in a society where energy is readily available and relatively inexpensive can we keep large homes comfortably heated and cooled; switch on time- and effort-saving appliances for every imaginable household chore; and have less than 5% of our population produce all of the food that the rest of us eat.

America now relies on petroleum as its staple energy source. The energy from petroleum multiplies the quantity of goods and services that a machine can produce. What if we suddenly discovered that there was no more fuel? Most machines would become obsolete and people would have to find other ways of performing work done by petroleum-fueled machines.

Energy is the capacity for doing useful work. People, horses and



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even gasoline possess the energy required to plow corn fields and thresh wheat. However, the rates at which a gasoline-powered engine can move a plowing machine and manpower can push a hand plow differ significantly. Gasoline contains a much higher concentration of energy than a human being, which means that a gasoline-powered plow has more potential

for performing useful work than its man-powered ancestor.

At the beginning of the nineteenth century, a major source of energy that our great-great-grandparents had to help them with their work was the power provided by their strong backs. In the early history of America, the muscle-power derived from human energy powered the crude plows, scythes, rakes and flails that transformed an uncultivated field into a harvest. However, by present standards, farmers worked very hard and produced very little.

In the early agricultural age, before the advent of the steam engine and commercial agriculture, the economy consisted entirely of independent family units. Farmers raised their own crops, built their own shelters and made their own clothing. At that time, human labor, the most basic of energy resources, produced barely enough to satisfy the needs of the family.

As time went on and agricultural implements were improved, the farmer could accomplish more work with less toil. However,

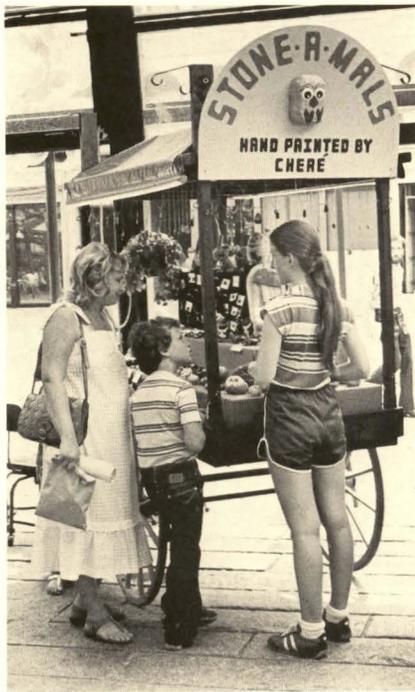
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Courtesy, The Boston Atheneum

Federal Reserve Bank of Boston Vol.4, No.3. Sept. 1977

# The Innovative Classroom



## SELLING ROCKS PAYS

Nine students from South Boston High School, Boston, MA are learning economics, marketing, accounting and retailing by selling rocks. Since July, they have been operating a push cart business at Boston's Quincy Market, selling

"Stone-a-mals" — painted rocks decorated as ornaments and jewelry.

The project is a joint effort of South Boston High School, the Federal Reserve Bank of Boston and the Educational Collaborative for Greater Boston, Inc. (EDCO).

The students divide their time between operating and maintaining the cart, and attending classes focusing on the problems of establishing and maintaining a business. In addition to the marketing, product development, economics, accounting and business planning, they are studying the city — the problems and forces affecting those who live there.

Classes began last spring. Kevin Bell, the project director, introduced three items — an African mask, a conch shell, and a package of Vita-Bath. The class then discussed some basic marketing concepts — why do the products sell and to whom do they appeal.

The class material is directly related to business. Students are anxious to understand the information to avoid making mistakes which would cost them money — in the form of profit sharing.

Another economic concept (besides profits) that is becoming a

reality to the group is competition — competition with the numerous stores and other carts, and competition among the student operators themselves. The market attracts crowds of tourists and workers from downtown businesses, and the variety of items vying for the buyers' dollars is extensive.

To make sure they get their share of business, the students have been studying advertising and product display. And to make sure everything is properly recorded, they are learning accounting.

They are studying the concept of capital. What is it? Why does a business need it? Where does a business get its capital? This has led to a study of debt and financing. (The project received its working capital from a state vocational education grant.)

They have learned how even the weather affects the economy — watching their sales rise and fall with the summer weather.

The operation will continue through the school year. So if you and your class are in Boston this year, stop by Quincy Market to see that "rocks really do pay."

## Multi-Media

Grade level code: Capital letters (E—J—H—C) after each item indicate grade levels for which the materials are most appropriate: E—elementary school, J—junior high school, H—high school, C—college.

**Fed Points** (J-H), 6 pages, is a brief, illustrated description of the Federal Reserve System and the Federal Reserve Bank of Boston. It discusses the structure of the System, services to banks and the Federal government, and how the Fed influences the money supply. Available in multiple copies from the Bank and Public Information Center, Federal Reserve Bank of Boston, Boston, MA 02106 or call: (617) 426-7100 X656.

**National Archives of the United States.** The National Archives is the Federal institution that preserves the records of the United States Government. American history is brought to life in the many photos, maps, recordings, and documents made available to the public. One can receive a wide variety of material ranging from Revolutionary War engravings to the tape recording of the surrender of Japan aboard the battleship U.S.S. *Missouri*. For a complete list of resources and prices write to: National Archives and Records Service, General Services Administration, Washington, DC 20408.

**I bet you thought that...** (J-H-C) 33 pages by David H. Friedman. The purpose of this booklet is to dispel some common economic myths. Since most of us are bound to certain misconceptions, Mr. Friedman discusses the truths

about money and banking as well as the falsehoods of economic "folk knowledge". Humorous caricatures illustrate the booklet's enlightening explanations. Copies are available free of charge from the Bank and Public Information Center, Federal Reserve Bank of Boston, Boston, MA 02106.



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# New England Update

## JOINT COUNCIL

Dr. Michael A. MacDowell, Executive Director, Illinois Council on Economic Education, has been named President and Director of the **Joint Council on Economic Education**, effective September 1, 1977. He is succeeding Dr. M.L. Frankel, President and Director since 1955, who is retiring.

## CONNECTICUT

The **Connecticut Joint Council on Economic Education**, in conjunction with the Hartford Public Schools, is running a workshop on the "Economics of Social Issues Facing America." The secondary school level seminar is focusing on a variety of issues — scarcity and the food supply (Is the price of food really out of sight?), the energy shortage, and the economy of Connecticut — to name a few.

The Council is planning to run several in-service courses this fall. Anyone interested in attending one, contact Edward Hamblin, Box U-32, University of Connecticut, Storrs, CT 06228. Or call (203) 486-2327.

## RHODE ISLAND

The **Rhode Island Center for Economic Education** at Rhode Island College is offering three courses this fall: Concepts in Economic Education, Consumer Economics, and Economic History in the United States.

*The Ledger* compiles information from various sources and is published periodically as a public service by the Federal Reserve Bank of Boston. Inclusion of news about economic education should not be construed as an endorsement of specific programs by the Bank. Material contained herein does not necessarily reflect the views of the Federal Reserve Bank of Boston or the Board of Governors. Copies of this newsletter and a catalogue of other educational publications, films and published research information may be obtained free of charge by writing: Bank and Public Information Center, Federal Reserve Bank of Boston, Boston 02106 or by calling (617) 426-7100 X656.

## MASSACHUSETTS

On May 27, 1977 a special tribute was paid to Professor Kenneth Sheldon, Executive Director of the **Boston University Center for Economic Education**, on the occasion of his retirement from that position after twenty-four years of distinguished service.

The new director for the Boston University Center for Economic Education is Professor Anton "Tony" Lahnston, School of Education.



## Datelines - Economic Education

### ECONOMIC EDUCATION CENTERS

Many of the economic education centers are planning workshops and in-service courses for the fall. If you are interested in what the nearest center to you is planning, contact the center at the address or telephone number listed below.

Connecticut Joint Council on Economic Education, Edward Hamblin, Box U-32, University of Connecticut, Storrs, CT 06268, (203) 486-2327.

Economic Education Council of Massachusetts, Thomas Curtin, Lincoln Filene Center, Tufts University, Medford, MA 02155, (617) 628-5000.

Maine Council on Economic Education, George Cunningham, 22 Coburn Hall, University of Maine, Orono, ME 04473, (207) 581-7067.

New Hampshire Council on Economic Education, Whittemore School of Business, University of New Hampshire, Larry Cole, Durham, NH 03824, (603) 862-2771.

Rhode Island Council on Economic Education, John Sapinsley, Rhode Island College, Providence, RI 02908.

ECON TREK, The Vermont Economic Education Project, Dr. Malcolm Severance, Continuing Education, Mount Grasse, University of Vermont, Burlington, VT 05401.

Center for Economic Education, American International College, Robert Hemond, Gordon Morrill, Springfield, MA 01109, (413) 737-5331.

Center for Economic Education, Boston University, Anton Lahnston, School of Education, 765 Commonwealth Ave., Boston, MA 02215, (617) 232-0121.

Center for Economic Education, Central Connecticut State College, Ronald Daigle, Marcus White Hall, Room 117, New Britain, CT 06050, (203) 817-7318.

Center for Economic Education, Salem State College, Henry A. Lucas, Salem, MA 01970, (617) 745-0556.

Center for Economic Education, Southeastern Massachusetts University, Richard Ward, North Dartmouth, MA 02747, (617) 997-9321.

Center for Economic Education, Tufts University, George Watson, Lincoln Filene Center, Medford, MA 02155, (617) 628-5000.

Center for Economic Education, Worcester State College, Paul O'Neil, Worcester, MA 01602, (617) 754-6861.

Center for Economic Education, Rhode Island College, Barbara Parker, Providence, RI 02908, (401) 456-8037.

## Energy Continued from page 1

horses and oxen were needed to pull the heavier, more efficient tools.

In the mid-nineteenth century, the switch from man power to animal power as the chief energy source provided Americans with more energy for farming. The extra power derived from work animals made possible the use of mechanical equipment for agriculture. Because of this increase in energy concentration, a greater amount of useful work could be accomplished in the same amount of time. As a result, the farmer was able to produce much more than before.

At the Paris Exposition in 1855, the effectiveness of the new, more energy-intensive technology was tested against human labor. It was discovered that six men using hand threshers could yield barely more than a bushel of wheat in an hour while with the improved machines, nearly twenty-one bushels were threshed.

By the second half of the 1800s, farmers produced more than enough to feed their families. As a consequence, they began organizing to sell their surplus at the market. By 1860, the American economy was transformed from a collection of self-sufficient farming families into an economy marked by commercial agriculture.

The development of a commercial agricultural economy was boosted further by the invention of the steam engine. Furnishing power for steamboats and trains, the steam engine, in effect, brought to America a more extensive and more efficient system of

transportation. Better transportation served to link farming communities and helped foster regional trade. By the year 1860, the rail system spanned the entire country and carried two thirds of the total internal trade.

The steam engine represented a higher concentration of energy that could be used for work. The application of a more powerful energy source had a great impact on the economy. More efficient, work-saving technology, powered by animals and steam engines, gradually took over the duties of the self-sufficient farmer. The man-hour requirements for producing an acre of wheat were reduced from 75 before 1830 to about 35 in 1860. By the third quarter of the nineteenth century, the crops in some regions were so vast that the entire agricultural labor force would not have been able to harvest them in season had human labor not been supplemented by more energy.

As commercial agriculture matured, the farmer tended to specialize in one particular money crop and used his proceeds to purchase housewares and farm supplies. A growing demand and supply for goods and services laid the foundation for the modern market system in the United States.

The evolution of a more energy-intensive system was a major force underlying a steady improvement in the standard of living in nineteenth century America. Advancements in transportation, technology and trade greatly increased the use of money as payment for human labor and for the goods sold. In turn, people expected to buy an

unprecedented variety and range of goods and services that were available on the market.

The agricultural age was pivotal in the economic history of the United States. Linking the self-sufficient colonial period of America's past with the Industrial Revolution, the agricultural age provided the groundwork for the harnessing of more concentrated forms of energy. Setting into motion the technological innovations inherent in this era, the agricultural age spawned the energy-intensive productive system which was vital to economic development and growth.

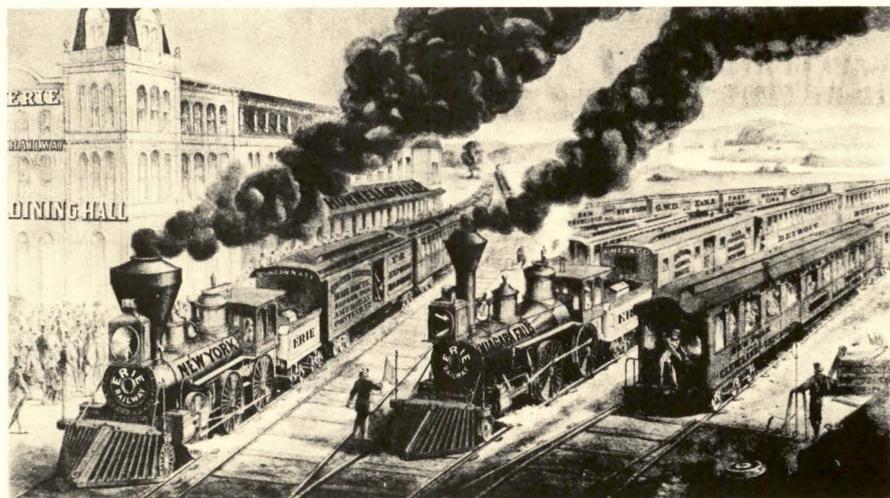
*Melissa W. Norton, author of the above article, was an intern at the Federal Reserve Bank of Boston, summer 1977. Ms. Norton is a student at Smith College.*

## Multi-Media

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**Biotherm Energy (J-H-C).** This report provides a simple answer to the energy crisis — the use of waste wood fiber. The founder of this theory, Norval Morey, promotes the concepts of "environmental harvesting" of the approximately five billion tons of wood that go to waste annually. Not only would the utilization of over-mature or dead trees provide the equivalent of more than eight billion gallons of oil per year but also it would provide the healthy trees in the forest with more room for growth and nourishment. For this unusual perspective on the energy problem contact: Morbark Industries Inc., Winn, Michigan 48896.

**Energy Research and Development Administration (H-C).** This is a good source for comprehensive information on current energy concerns as well as on alternative energy technology. Among the many pamphlets distributed by the ERDA, Mr. William W. Eaton has written thorough descriptions of Solar Energy, Geothermal Energy, Energy Technology and Energy Storage. For a title list or for further information write to: USERDA — Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830.



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