

AEOLUS

The Chronicle's weekly magazine

76th Year, No. 14

Duke University, Durham, North Carolina

Wednesday, September 17, 1980

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Blowing up the nuclear issue

Happy Bryan Hour to make many happy returns

By David Hewitt

Happy Hour in the C.I. will return to its traditional format starting this Friday, Ben Sheridan, speaker of the legislature, announced last night at ASDU's second regular meeting of this semester.

The C.I. will operate on a cash basis at dinner time on Friday nights; therefore, students will not have to pay the 12-point dinner rate to gain entrance.

Buried as it was in the middle of necessary but less dramatic items of business, Sheridan's announcement elicited cheers from ASDU representatives.

ASDU president Bryan Fair's summer trip to Oregon was also discussed. A debate arose concerning whether Fair should be allowed to give a 10 minute speech limited to explaining his observations of the United States Student Association convention that he attended in Oregon.

"Since Bryan has decided to finance the trip to Oregon himself and the External Affairs Committee will examine and report on Fair's suggestions for membership in a national organization, a debate now would only be a fruitless waste of time," Sheridan said, advocating a 10 minute talk by Fair.

In the ensuing debate on whether Fair should be allowed to speak at all, Fair announced that he had brought a representative of USSA with him to the meeting.

The legislature granted Fair a 10 minute speech, and allowed Doug Tuthill, the representative from USSA, to speak for five minutes on his organization. The legislature then decided to postpone Fair's and Tuthill's speeches until the end of the meeting.

Then the legislature conducted elections for parliamentarian, recording secretary, and sergeant-at-arms. Shep Moyle, Robin Stinson, and David Gendell, respectively, were elected to the posts.

In other elections, the legislature voted for nominees

for an ad hoc committee on women's studies and the AB Duke Scholarship Steering Committee.

The legislature also elected Maria Sorolis, Jay Booker, Dirk Zuschlag, Bill Podulka, and Neil Sullivan to the Student Organization Committee, which budgets ASDU's money.

Fair then delivered his Executive Report on the ASDU committee chairmen's retreat to Emerald Island last weekend. He said that all the ASDU members who went on the trip came back feeling "optimistic, ambitious and hopeful" about putting past intragovernmental conflicts behind them.

At the end of the meeting, Fair declined to give an explanation of his summer trip, and let the USSA representative speak.

"I will wait around after this meeting," Fair said, "and answer questions about my trips for those that really want to hear, without the parliamentary delays." □



PHOTO BY ANDREW FRANZONI

Masterpieces, three for less than \$10, are being sold on the main quad this week.

Duke ranks third in CPA exam

By Rob Paduano

Duke students who took the North Carolina Certified Public Accountant exams last May had the third highest success rate in the state.

Duke students passed an average of half of the four-part test.

Wake Forest had the highest proportion of passing grades on the test, followed by Elon College, where only five students took the test.

According to Robert Dickens, director of undergraduate studies in Management Sciences, Duke's high success rate is consistent with the results of the past few years. "It does fluctuate," he said, "and this (year's result) is the low end of the fluctuation."

Any college graduate who has majored in business or accounting can take the exam.

The high passing rate can be attributed to several factors. According to Ellen Cox, assistant professor of management sciences, the size of the accounting classes on the undergraduate level ranges from 10 to 15 in senior seminars to approximately 45 in lectures.

"The class sizes are set so that the professors can handle a one-on-one faculty-student relation when necessary," she said.

In addition, the department will have only one graduate student in the management science department this year. At many schools, teaching assistants often take the place of professors.

"We don't use any T.A.'s here," Cox said of the accounting department.

According to David Dittman, area coordinator of the accounting department, an improvement could "probably" be made in Duke students' test scores, but the administrators of the department are not interested exclusively in training students to do well on the CPA exam.

"Our philosophy is to prepare students to eventually take on managerial positions in the field, and not to just be an average accountant," he said.

When asked whether the termination of the management science department in two years has had any noticeable effect on the quality of instruction, Cox said she saw none.

She mentioned that next year many of the courses in the management sciences department will be smaller because only seniors will be enrolled, but otherwise there should be little change. □

Fair urges Duke to join USSA

By William Cohen

In a forum held yesterday in the Pegram commons room, ASDU president Bryan Fair discussed the desirability of housing future freshmen on East Campus and his controversial trip to Oregon.

Approximately 30 students attended the forum. Doug Tuthill, chairman of the United States Student Association, was also present.

Fair said he plans to recommend to the legislature that ASDU reassociate itself with the USSA. ASDU has been a member of the American Student Association since it was formed in 1978.

He said he believes delegates have little influence in the organization and most decisions are made by the executive board.

He also mentioned a lack of political involvement of the ASA. In contrast, the USSA has a well-respected political lobby and a history of political involvement, he said.

After the forum, Tuthill said the ASA has no political influence. "You can't just walk into Washington and expect to have influence," he said.

Tuthill said the ASA was founded because of "personality conflicts" by Tom Duffy, after he had unsuccessfully run for president of the USSA for the second time.

The USSA is lobbying for passage of the Higher Education Re-Authorization Act, which will affect student loans and financial aid. The USSA is also a member of the Coalition Against The Draft and a coalition opposed to the arms race.

Fair implied that a reluctance to get politically involved might have been a factor in the ASDU executive council's refusal of funds for his trip.

Fair also said he opposes plans to house future freshmen classes on East Campus. He added,

however, that changes are needed before East Campus will be "a viable alternative" to West. He recommended instead that single-sex dorms, including fraternity houses, be eliminated.

Fair also commented on retrenchment. He said that the elimination of the education department and the School of Nursing is necessary because of poor management in the past, but did not elaborate. □

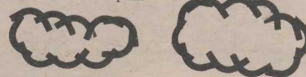


UPI PHOTO

Joan Mondale politicking in Durham in 1976. The Mondale's son, Ted, will be shaking hands in the dining halls today.

Newsbit

Ted Mondale, son of Vice President Walter Mondale, will be visiting Duke today. He will be meeting students in the Blue and White Room from 12:30 to 1 p.m.



Today's forecast is partly cloudy with highs in the mid to upper 80's, lows in the high 60's. Twenty percent chance of rain through Wednesday night. Thursday afternoon, scattered showers and thunderstorms predicted with highs in the mid 80's. Extended outlook for the weekend, Friday through Sunday, fair and warm. Highs in the 80's lows in the 60's, 50's in the mountains.

Duke Power is investing in nuclear energy

By T.J. Maroon



With one nuclear power plant now in operation and more than \$2 billion already spent in construction of three new facilities, the Duke Power Company has made a major commitment to nuclear energy.

Duke University has a considerable stake in the future of these plants since it receives, both indirectly and directly, a substantial amount of its funds from Duke Power.

Duke Power Co. serves the Piedmont of Central North Carolina and South Carolina. It employs almost 20,000 people and has assets of approximately \$5.6 billion, according to Alex Coffin, manager of news services for Duke Power.

"Duke Power Company has made a major commitment to nuclear energy."

According to Stephen Harward, University treasurer, "In 1924 when Mr. Duke established the Duke Endowment, he basically funded it with Duke Power Company stock."

The Duke Endowment owns more than 13 million shares of the company's stock, Harward said, the market value of which is about \$225 million.

He said the Duke Endowment receives "a little over 70 percent of its income" from Duke Power.

The University then gets 32 percent of the Duke Endowment's income, Harward explained.

"Last year the University got \$9.5 million from the Duke Endowment," he said. "As Duke Endowment funds go, so goes the University."

For example, Harward said, a 10 cent increase in Duke Power's dividend would be translated into a \$1.3 million increase in Duke Endowment income and a \$417,000 increase in University income.

"We have a great stake in Duke Power," he said. "If Duke Power cuts its dividend, it really hurts. We might then have to raise tuition."

"Duke Endowment receives 'a little over 70 percent of its income' from Duke Power."

Harward said the Duke Endowment once owned about 40 percent of Duke Power Company but has since diversified its investments to comply with a federal law prohibiting foundations from owning more than 20 percent of any one company.

In addition to these funds the University receives from the Duke Endowment, the Duke University Endowment (which is separate from the Duke Endowment) owns 31,228 shares of Duke Power stock, Harward said, at a market value of \$550,000.

Dividends from these shares will net the University about \$60,000 this year.

He said until this year the University Endowment had owned about 52,000 shares of Duke Power stock.

According to Coffin, the only nuclear plant the company is now operating is the Oconee plant near Walhalla, N.C., which has been running since 1973. The plant cost \$574 million to construct, he said.

"The Oconee operation has consistently saved our customers money," Coffin said. "So far it has saved \$404 million" compared to what a coal-burning plant would have cost.

Coffin said Duke Power is currently researching alternative sources of energy, and is engaged in "an awesome number of studies to meet the requirements of various departments of government."

He said he knew of no Duke Power-sponsored nuclear research going on at Duke University.

William Walker, chairman of the physics department at Duke, said there is no research on nuclear power at all at Duke.

Duke Power also reported that it has annual expenditures of around \$600,000 for advertising, \$1 million for nuclear research, and \$6.9 million for general research.

Coffin said Duke Power is constructing two nuclear units at McGuire, N.C., just north of Charlotte. "We should have one unit on line by the end of this year and the other on line by 1982," he added.

The company has already spent \$1.2 billion building the McGuire plant, he said.

In addition, Coffin said, Duke Power is constructing two units in York County, S.C., scheduled to be completed by 1984 and 1985, and two units at Cherokee, S.C., to be ready in 1990 and 1992.

He said the company has spent \$677 million on the York County plant and \$332 million on the Cherokee plant thus far.

Coffin said the company works hard to inform the public about its activities in the nuclear power field. Duke Power is "constantly seeking, through press releases, bill inserts and various publications, to keep our customers informed, as well as our stockholders, as well as government officials."

AEOLUS

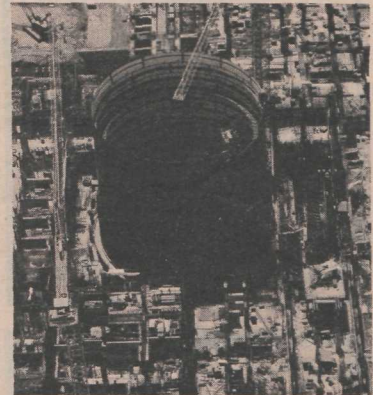
Duke's community fosters a microcosm of the national nuclear energy debate. The University has ties to Duke Power Co., a large industrial proponent of nuclear power; yet some members of the Duke community support the use of nuclear energy while others, both faculty and students, are vocal anti-nuclear activists.

Some of the University debate spills over into the pages of local newspapers, such as several columns by faculty members written for the *Durham Morning Herald* in March and July 1980.

Always interested in promoting activism, no matter what your persuasion, *Aeolus* has opened its pages this week to an informed forum on the virtues and pitfalls of nuclear energy. Happy reading!

"Because we are a regulated company," Coffin said, "there are restraints on how we spend our money in that area. Certain types of information are not released."

Editor's note: T.J. Maroon is a Trinity senior.



Aerial view of Shearon Harris Power Plant under construction.

Aeolus

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Aeolus

Aeolus (pronounced EE-uh-lus) is a name rich with literary allusions. In James Joyce's *Ulysses*, a great experimental novel of the 20th century, *Aeolus* is the title of an episode about a newspaper office. In Homer's *Odyssey*, on which *Ulysses* is based, *Aeolus* is the name of a wind that blew *Ulysses* off his homeward course and into a long series of epic adventures. These winds were believed to make music on a magical harp and became a symbol of poetic inspiration for the

English Romantic poets.

At Duke, *Aeolus* means it's Wednesday, time for the *Chronicle's* weekly magazine. We hope *Aeolus* will inspire epic journalism and poetic responses.

We need writers, graphic artists and ideas, so come up and see us — we're almost always in the office.

And-remember, it's "EE-uh-lus!"

PHOTO COURTESY OF CP&L



The Chronicle

The *Chronicle* is published Monday through Friday of the academic year, and weekly through ten (10) weeks of summer sessions by the Duke University Publications Board. Price for subscriptions, \$20, \$75 for first class mail. Offices at third floor Flowers building, Duke University, Durham, North Carolina 27706. Application to mail at Second-Class Postage rate is pending at Durham, NC. POSTMASTER: Send address changes to the *Chronicle*, P.O. Box 4696, Duke Station, Durham, NC 27706.

Marie Austin

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GRAPHIC BY SUE LONTKOWSKI

SML

Nuclear option necessary

By Charles M. Harman



Energy is an essential (and perhaps deceptively influential) element in the functioning of modern civilization. The correlation between per capita energy consumption and prosperity is readily observable. More significantly, energy use has been found to correlate more strongly with the quality-of-life index than even the gross national product on a per capita basis.

These considerations and the concern of the engineer with the improvement of living conditions through technology persuade me that abundant energy at a minimum cost is an exceedingly desirable goal. This position is taken recognizing that energy in any form is obtained at some societal cost, and thus this is a value judgment which is far from universally accepted.



PHOTO BY ANDREW FRANZONI
Charles W. Harman

Coal has been cited as being the appropriate energy supply for the U.S. It is needed and its use must increase. It is presently the only viable alternative in this country to nuclear energy. Its use inherently entails producing mountains of ash waste and contributes to the ominous buildup of carbon dioxide in the atmosphere. It might be remarked that the alternative of coal is not available to all countries with energy problems.

Solar energy has been cited as the energy of the future. It is needed and could provide significant energy in the form of low temperature intermittent heat for living space and hot water. Electricity through solar photovoltaics is prohibitively costly except for small, special or highly subsidized applications. In addition, providing continuously dependable solar energy presents storage problems which are unlikely to be solved economically except in limited low temperature applications.

Rather than looking to energy sources, conservation has been promoted as a solution to our energy problems. Conservation is needed and is desirable when it implies reduction or elimination of waste.

Conservation is most readily achieved through pricing, so conservation is imposed most rigorously upon those on the lower end of the economic scale. This aspect of conservation can readily mean a decrease in human opportunity and physical hardship, results which I find to be most unattractive.

Nuclear energy provides a significant and growing portion of electrical power in the U.S. and worldwide. This is happening even though being "anti-nuke" has become the most universal and popular form of activist protest.

Nuclear energy growth is happening in some countries because it is the only viable alternative to expensive and politically tenuous dependence on imported energy. It is happening elsewhere because the nuclear energy supplies are abundant and because they are, by far, the most economic form of energy available.

Currently in the U.S., typical utility energy costs per million Btu are \$.90 for nuclear, \$1.85 for coal and \$.51 for oil. It has cost our local utilities up to 50 percent more to generate electricity from their coal plants than from their nuclear plants. Nuclear development has simply been the result of the economic incentive.

The commercial nuclear power industry has an unparalleled record of safety. Based on projection and statistics and including the entire fuel cycle, nuclear energy is approximately eight times safer than coal energy in terms of fatalities per unit of power produced.

Opponents have made many conjectures concerning the dangers to the public of low-level radioactive releases from nuclear plants, but the fact is that the levels encountered have been so low that no harm at all can be postulated based on proven morbidity-radioactivity exposure statistics.

Finally, with regard to safety, the disposal dilemma is far more a political than a technological problem. For instance, the radioactive caverns produced by underground nuclear bomb tests are accessible, have ample capacity, and their use for storing radioactive waste could have zero effect on the environment by any standard.

Other than the protest demonstrations, the central thrust by those philosophically opposed to nuclear power is in the direction of making it less economical.

Efforts in this direction have produced ponderous safety and safety documentation requirements. The ban on reprocessing spent fuel rods probably increases net fuel costs by a third. The licensing and litigation delay tactics during plant construction increase costs significantly. For instance, the interest on the money borrowed during the typical 10 to 15 year construction period for a nuclear plant has come to cost more than the plant equipment itself.

The economic and abundant availability of energy will affect our future security and prosperity. Energy waste should be reduced and each of our energy resources called upon to provide that segment of our energy needs to which it is best suited.

Nuclear energy can provide an important segment in our energy future.

Editor's note: Charles M. Harman is a professor of mechanical engineering.



GRAPHIC BY MICHAEL BRUCE McFARLAND

Wednesday, September 17, 1980

Waste vs. safety

By Peter Wood

By Constance Kalbach and William D. Walker



Nuclear waste disposal is part of a much broader industrial waste problem. Each year, American industries produce more than 60 million tons of hazardous waste.

All of these dangerous materials must somehow be isolated and stored when they have lost their agricultural, commercial or military usefulness. Currently, according to *Newsweek*, 90 percent of the nation's dangerous waste is disposed of improperly.

The illegal spilling of PCB [polychlorinated biphenyls, a chemical suspected of causing cancer] along North Carolina roadways has illustrated the problem dramatically. Recent reports from Love Canal and other places, however, make it clear that this local story was not unique. Management of past, present and future hazardous wastes — including nuclear wastes — is suddenly becoming a topic of national concern.

Radioactive waste constitutes only a small part of the thousands of dangerous compounds now being produced, which range from the "violently lethal" to the "merely toxic."



Peter Wood STAFF PHOTO

Nuclear waste includes reactor and reprocessing "offgases" (containing radioactive iodine, carbon, tritium and krypton), "hot scrap" and rubbish, decommissioned nuclear plants and their components, and all of the unusable, radioactively contaminated by-products of the nuclear fuel cycle and of military weapons programs.

Such wastes are classified "high level" or "low level" depending on the penetrating power of their radioactivity. The radioactive garbage from Carolina Power & Light Co.'s Brunswick nuclear plant that was found illegally buried at a county landfill near Wilmington last March was low-level waste. The toxic liquids that have escaped from storage tanks at the Savannah River Plant near Aiken, S.C. — more than 700 gallons in one incident — are high-level waste.

Because of the obvious long-term risks connected with radioactive waste, expensive and sometimes imaginative efforts have been made to solve the awesome problems of nuclear waste management. In the past generation, more than 75,000 barrels of low-level waste were dumped in oceans near San Francisco and Delaware, and plans have been drawn up for firing waste into outer space.

"We are now creating hazardous garbage at such an unprecedented rate that experts studying the issue are deeply pessimistic."

Despite industry hopes and claims, however, no foolproof method of permanent disposal yet exists, and most waste is being kept on land in expensive "interim" storage.

The South's first commercial low-level dump opened at Maxey Flats, Ky., in 1963, where nearly five million cubic feet of radioactive waste was buried in shallow trenches. Ten years later, it was clear that radioactive materials (including plutonium, with a half-life of 250,000 years) were escaping already.

In 1976, a study of Maxey Flats by the Environmental Protection Agency stated: "The burial site was expected to retain the buried plutonium for its hazardous lifetime, but plutonium has migrated from the site in less than 10 years."

See Waste on page 10

Wednesday, September 17, 1980



For years we heard, "Nuclear reactors are safe," and "There's no need to worry."

Then came Three Mile Island with all its fright, confusion and apparent danger.

Were we misled? Were the reassuring voices wrong? To answer these questions we must first answer another question: What to we mean by "safe"?

Certainly "safe" does not mean "without risk."

You can get hit crossing the street or driving in your car. Your house can burn down while you're sleeping. You can choke on your food, fall while walking, or drown in the bathtub. Risks are a part of everyday life. We can't escape them. All we can do is try to understand them.



We continue to walk and drive and cross streets because the need to get someplace outweighs the risk involved in getting there. We eat because the risk of choking is small compared with the risk of starving. So when we call something "safe" we really mean that its risks are very small compared to its benefits.

But the risks are not always easy to estimate. For instance, which is safer, traveling by automobile or traveling by plane? Statistics show that for each mile traveled you are much safer in an airplane. Yet many people who drive to their vacations are afraid to board a jetliner. The reason is that an airplane accident kills more people, so it makes news. We are much less aware of the 500 people who get killed each holiday weekend in separate automobile accidents.

Statistically, the risk of traveling is equal to the likelihood of an accident multiplied by its effects (death, injuries or property damage).

Risk equals probability of accident multiplied by consequences. Larger consequences (as in plane travel) do not necessarily mean larger risk if the accidents are rare.

A similar situation exists with regard to generating electricity. Statistically, nuclear-fueled power plants are a safer way to go than coal. Coal mines collapse. Miners get black lung disease. And people with lung problems suffer from the tons of irritants that go up the smoke stack.

Yet nuclear energy is viewed with much greater alarm by the public. The reasons are that it is a less familiar technology and the consequences of an accident could be much larger. Since our need for nuclear energy is so great, it is important that people understand how the plants work, what is being done to keep them safe, and what the probabilities of a major accident really are.

Nuclear power plants work very much like coal- or oil-fired plants. Heat is used to make water into steam. The steam runs turbines which in turn generate electricity. The difference is that in a nuclear plant the heat comes from the splitting of uranium atoms in a reactor rather than from burning coal or oil.

Because of the hazards involved with radioactivity, a nuclear power plant is designed with multiple layers of protection against the spread of radiation.

First the uranium fuel is sealed in metal tubes called fuel pins. As it is used up, these same tubes seal in the radioactive wastes that are produced. The fuel pins and the water that cools them are enclosed in a steel "pressure cooker" or pressure vessel with 6- to 10-inch thick walls. This is the second layer of protection.

See Safety on page 11



An anti-nuclear demonstration in 1979.

TIP TOP

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Nuclear moments

By Joseph J. DiMona



Nuclear energy has become an integral part of our country's energy program, sanctioned by the federal

government through the Nuclear Regulatory Commission, because it is profitable to corporate capitalism.

With government regulation, the nuclear power industry has managed to shield itself partially from the most potentially damaging aspect of its operation, clean-up costs, while the public is forced to pay to neutralize the effects of an industry accident or radiation spill.

In a recent article for *Mother Jones* magazine, Ray Reece writes that "the vast preponderance of each year's federal energy budget has been apportioned to fossil and nuclear technologies. In 1978, for example, we estimate \$9 billion, or about 80 percent of the energy budget, was so allocated

between industry and government. The report states, "NRC and FEMA agree that the operators of nuclear facilities have a primary responsibility for planning and implementing emergency measures within their site boundaries."

Local governments hold evacuation and clean-up responsibility for areas outside of the power plant's immediate site boundaries.

In a report dated May 10, 1979 an ad hoc committee composed of seven NRC, Environmental Protection Agency and Health, Education and Welfare (now Health and Human Services) personnel examined the estimated health risk of the accident at the Three Mile Island nuclear power plant for the period March 28-April 7, 1979. The activist group Students for Alternatives to Nuclear Energy states that the accident is expected to cost up to \$760 million in clean-up costs, with some private and some public funding meeting the expenses. The ad hoc committee report estimated:

The collective dose to external radiation within the 50-mile radius... was approximately 2,000 person-rem (plus 500 or minus 1,000 person-rem) through April 3, 1979. ... There is also a populated region... that extends up to 3.5 miles north of Three Mile Island and slightly inland on the eastern bank of the Susquehanna River. Individuals... this region located outdoors for the entire week also could have received about 1.0 mrem.

The term *rem* represents a biological dose unit used to provide a criterion of biological injury to human cells when applied to different radiations. For example, 5 rem (or 5,000 mrem) is the NRC recommended dose limit for one person for an entire year. A dose of 5 rem (or 500 mrem) is considered by the NRC to be the dose limit for a pregnant woman.

Latent cancer, genetic birth defects and in some cases immediate fatality are conceded by the government reports to be the direct result of radiation over-exposure.

Since the profitable operation of nuclear power plants often requires the transportation of dangerously radioactive fuels through densely populated areas, strict NRC transportation safety rules still fail to protect the public from the risk of a potential large-scale disaster. In its "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes" of December 1977, the NRC said:

However, in the unlikely event of a major release of plutonium or polonium in a densely populated area, a few individuals could suffer severe radiological consequences. One early fatality would be expected, and as many as 60 persons would be exposed to radiation dose levels sufficient to produce cardiopulmonary insufficiency. The latent cancer fatalities associated statistically with such a major release are estimated to be as many as 150 over a 30-year period. Costs for land reclamation... could range from \$250 million to \$800 million for 1975 shipments and up to \$1.2 billion for 1985 shipments.

See Moments on page 11
Wednesday, September 17, 1980

the LUAU

Suckling Pig
Macadamia Fish
Chicken Hawaiian with Hoomalimali Sauce
Prince Kuhio Sweet Potatoes • Molaki Rice
King Kamehameha Mixed Vegetables
Diamond Head Fruit Salad

Desserts

Lei Lani Bananas
Pina Mallon Wakiki
Kona Coconut Pie
Mauna Kea Jello

Beverages

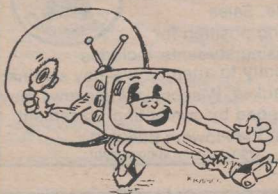
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meeting

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in 136 SOC SCI

while \$415 million, or 3.7 percent, was directed toward renewables such as solar, wind and other forms of energy. ... The same emphasis on nuclear development, according to a recent memo from Department of Energy Secretary Charles Duncan, Jr., is due to prevail annually through (fiscal year) 1986."

In a January 1980 document titled "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" the NRC and the Federal Emergency Management Agency addressed the question of responsibility in the event of a major accident at an operating nuclear power plant.

They described two categories of risk to the public health: the Plume Exposure pathway, radiation from exposure to the passing cloud of radionuclides released, and the Ingestion Exposure pathway, radiation from contamination. Of the first category the document said:

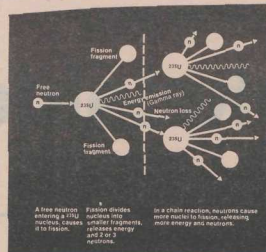
The principal sources from this pathway are: (a) whole body external exposure to gamma radiation from the plume and from deposited material, and (b) inhalation exposure from the passing radiation plume. The duration of the release leading to potential exposure could range from one-half hour to days.

Of the second category the document said:

The principal exposure from this pathway would be from ingestion of contaminated water or foods such as milk or fresh vegetables. The duration of potential exposure could range in length from hours to months.

Responsibility for emergency assessment and response is divided

Atomic dream—world



GRAPHIC BY ATOMIC INDUSTRIAL FORUM

By Gary Friedman



The drone of the professor's metronome-like voice acted as a soothing anesthetic. Numbed by boredom, I sank slowly into a spineless position. Chemistry at 9 a.m. can leave battle scars on the eyelids. Through tiny slits, I could see the huge Periodic Table of Elements lit up in technicolor.

From a distance, it looked like a Kansas rainbow—first the reds of the alkali metals, then the greens of the earth metals, the blues of the halogens, and finally the soothing pinks of the inert gases. I was fading fast.

The last things I can remember seeing

"Through tiny slits, I could see the Periodic Table of Elements lit up in technicolor."

were the two elements, Kr (Krypton) and U (Uranium) highlighted on the periodic scoreboard in yellow, but it was too late. My eyelids had lost their fight for survival. The rainbow vanished, the periodic table disappeared.

Ahhhhh, the mellifluous color of solar yellow illuminated my imagination. As I entered stage two of REM sleep, I dreamt of a war between the elements for control of all molecular civilization—the Krypton Empire vs. the Uranium Kingdom.

The hostilities between these two "periodic" powers dated back 35 years to the time when Uranium was ruled by the tyrannical monarch, U-238 (the 238th king of Uranium). At that time, Uranium was a weak Third World element sorely in need of a strong military to make it a competing molecular power. Uranium's atoms were poorly trained for military service—its protons were an inefficient land force and its electrons couldn't hold water at sea.

Fearing both a totalitarian regime and eventual destruction of their element, top Uranium scientists plotted the murder of U-238 and the creation of a lethal offensive weapon which had the potential of destroying all other 103 elements.

Their plan was to use Uranium's plentiful domestic supply of neutron resources to bombard U-238 to death and create from his remains a radioactive poison, named Plutonium 239, a substance known to cause chemical damage in the subshells of elements. Research indicated that the offspring of elements might suffer serious brain damage from exposure to Pu-239 radiation. They called this top secret project, Operation NUKE (New Uranium Kingdom Eternal).

Wednesday, September 17, 1980.

The plot was successful as planned—King U-238 died a horrible death and sacrificed his life for the creation of a lethal poison. For three and a half decades, entire elements were wiped off the face of the periodic chart by this Pu-239, until only Krypton and Uranium remained.

The Empire of Krypton had endured the nuclear holocaust only because of a phenomenal natural substance that grew wild on that element, called "Kryptonite," an igneous rock so powerful that even the most superatomic elements were destroyed in its presence. The distribution of these rocks all over Krypton had created an impenetrable force field through which even the lethal doses of Pu-239 could not pass.

However, 35 years of constant radiation exposure had worn the force field so thin it was rendered useless as a protective agent. It was just a matter of time before Krypton would be permanently obliterated.

Krypton's only chance for survival was a full-scale attack on Uranium's NUKE reactors, containing the deadly Pu-239. It planned a sneak attack on the reactors, through the northwest side of the isotope. However, Uranium Intelligence caught wind of the plan in advance and decided to eliminate the enemy before any damage could be inflicted on Uranium.

It was only a matter of minutes before Krypton was permanently silenced. The destruction was quick and efficient—no cries, no shouts. Only the rubble remained, engulfed in a voluminous mushroom cloud.

The future was kind to Uranium. Its atoms were happy because energy was plentiful. Hundreds of NUKE reactors were erected from molecular subsidies. No major accidents or catastrophes occurred.

Shipment of the nuclear waste from the breeder reactors was no problem because of the barren lands that had been created by the destruction of the other elements for use as a dumping ground. Only 200 pounds of bomb-grade plutonium went unaccounted for each year. Nuclear waste disposal was 99 percent efficient.

One day, on the 100th anniversary of the destruction of Krypton, Uranium joined its victims. The entire population was wiped out—painlessly destroyed.

I woke up in a cold sweat. The classroom was empty and the Periodic Table of Elements was completely dark. I could hear myself breathing heavily. I stood up, took a long glance at the silenced elements, and walked out. □

Editor's note: Gary Friedman is a Trinity sophomore.

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PHOTO BY ANDREW FRANZONI
Constance Kalbach.

PHOTO BY ANDREW FRANZONI
William D. Walker.

Editor's note: Constance Kalbach is a nuclear chemist and a visiting assistant professor of physics. William D. Walker is chairman of the physics department. This article is reprinted with permission of the authors and the Durham Morning Herald.



The year is 2000. A new century. A new millenium! It is now only 20 years away. When that day dawns, Jan. 1, 2000, will it find our nation free, independent and prospering? Will our children enjoy the same benefits we have enjoyed? The answer depends largely on the amount of energy available, not just in this country but worldwide.

Even here in the United States our energy needs will grow in the next 20 years. Our population is stabilizing, but

"If the United States continues to hog much of the world oil market, the penalty could well be war."

our work force is growing, and new jobs require more energy. Even allowing for strict conservation, most studies estimate that by the year 2000 we will need at least 20 to 25 percent more energy than we use today. Clearly, if we are to continue to prosper and to enjoy anything like our present standard of living, we must find more energy.

The reason we need nuclear energy is that the world needs more energy. The developing countries are demanding a larger share of the global energy reserves. Yet if we were to take all the energy used in the world today and distribute it equally to every man, woman and child, we would find, you and I, that we have only one-fourth of what we do now.

Imagine using only one-fourth of the electricity, driving only one-fourth of the miles, burning only one-fourth of the home heating oil you do today. Then remember that we use energy in manufacturing, farming and commercial transportation. Store shelves would be bare, nearly three-quarters of the jobs would be gone, and people would be hungry. Clearly, equal distribution of existing energy is not enough. The world needs more of it; lots more.

Where will we find it? There is no magic answer, but rather we must rely on a variety of sources, old and new.

Oil is an old standby. But while more of us are aware that supplies are dwindling, fewer of us are aware of the consequences of this fact.



PHOTO BY HEYWARD ROBINSON
Student activists march against nuclear energy.

Take sides on the

**By Constance Kalbach
and William D. Walker**

Developing countries have a critical need for oil to run tractors to grow food. If the United States continues to hog much of the world oil market, the penalty could well be war. Apart from this, oil is a precious resource that our grandchildren will need, not to burn but to make drugs and plastics.

So the United States must curb her appetite for oil, not expand it.

Solar power looks like a promising source of energy, and, indeed it is. Yet we dare not expect too much from it. Sunlight, though abundant, is spread out so thinly that it is difficult to use efficiently.

Windmills (a form of solar energy) are applicable in a few isolated areas and should be developed, but they are not a general answer. Solar water heaters are available but only at significant cost (around \$2,000) and you still need a backup system for cloudy weather, unless you like cold baths. Solar heating and cooling for buildings is, likewise, expensive and works best when designed into new structures.

Our best hope for significant use of solar energy lies in a number of technologies that are still being developed to convert sunlight into electricity. Thus we should be looking to solar energy for the future, not counting on it for today.

Hydroelectric power is a relatively small contributor, accounting for only about four percent of our total energy. It is limited by the number of readily damnable rivers and streams, most of which have already been harnessed. Thus it would take a major effort at dam building and a major commitment of our land and money to even double this figure.

This leaves us with coal and nuclear as our currently available options to see us through to the new millenium. Coal and nuclear will have to take over for much of our Arab oil. They will have to generate the extra power needed to supply jobs for our expanding work force. And neither one can do it alone.

Coal is a flexible energy source. It can be

used to generate electricity or to make steel. With more advanced technologies it can be made into substitutes for petroleum. But we can't get it out of the ground fast enough.

To replace all of our imported oil with coal would mean doubling our rate of coal production. The extra coal we would have to mine each year would fill a train of coal cars stretching all the way around the earth — four times. To supply the additional energy for our growing work

See Energy on page 15



Construction at Shearon Harris Power Station, 1985.

ANDREW JAMES CHANDLER
OF THE UNIVERSITY OF CALIFORNIA



e nuclear debate

By Thomas Wartenberg



PHOTO BY LAURA JOSEPH

Thomas Wartenberg.

Editor's note: Thomas Wartenberg is an assistant professor of philosophy. This article is reprinted with the permission of the author and of the Durham Morning Herald.



Despite the near-catastrophic accident at the Three Mile Island nuclear generation station March 28, 1979, many people still see nuclear power as a necessity. While no longer able blithely to assure the public that nuclear power will provide the technological salvation of humankind, nuclear power advocates have adopted a new pose that is, they tell us, more in line with the harsh realities of the age.

Risk is part of life, we are told, and

nuclear power, while far from risk-free, is a necessity if we are to be able to continue our way of life.

Such a justification of dependence on nuclear energy as a way of meeting "our energy needs" has recently been called into question by a growing number of scientific experts and concerned citizens. Many now believe... that nuclear power is not necessary, is not safe and is not cheap.

In short, following the nuclear path is not the way to meet the problems of providing Americans with an acceptable amount of energy to fuel their way of life.

Despite the growing debate surrounding the issue of nuclear power, many myths still dominate the public discussion. In this article, we will examine two of the most basic myths.

Myth Number One: Nuclear power is necessary to decrease U.S. dependency on foreign oil.

While it is true that our staggering dependency on overseas oil is a matter that Americans must confront swiftly, the development of nuclear power will do little to meet the problem.

Nuclear power is a method of generating electricity, and very little of our dependence on oil is due to its ability to generate electric power. Where oil does play a part in generating electricity, it is already being replaced by coal-fired plants.

More and more experts now agree that increased conservation, not expanded generation, is the key strategy for decreasing our electricity needs. A 1975 study made by the American Institute of Architects stated that "improved design of new buildings and modification of old ones could save a third of our current total U.S. energy use — and save money too."

Since President Carter foresees only a 23 percent dependence on nuclear power for our electric energy needs, this one strategy for conservation would make the need for nuclear power a dead issue.

In the face of evidence like this, it is hard to disagree with Amory Lovins' conclusion that commitment to nuclear power is like using a chainsaw to cut

butter. There is no need to adopt a high-risk, mammoth and costly energy system to solve problems for which simpler solutions are at hand.

All too often in the past, we have followed such leads only to beat a hasty retreat in the end. Such retreat is costly. There is still time for us to avoid another blunder. This can only be done if we clearly reject the nuclear option.

Myth Number Two: Nuclear power is necessary to preserve the American way of life.

Although the meaning of the term "the American way of life" is not clear, proponents of nuclear power want to focus attention on Americans' admittedly high level of consumption.

Whether we will be able to continue to consume as much as we now do in the future, especially since the Third World controls so much of the raw materials necessary to support this consumption, is a subject of increasing debate.

Once again, thoughtful reflection makes it clear that nuclear power has no role to play in supporting our expensive habits. Alternative strategies already exist for meeting our energy needs — renewable sources and conservation being the primary ones.

The threat of a radical change in our consumption patterns if we fail to tread the nuclear path is simply a specter raised by the proponents of nuclear power to scare the unwary. It can only intimidate us if we remain uninformed.

One aspect of "the American way of life" is clearly threatened by the advance of nuclear power. Our vision of the United States as a land of opportunity depends less upon material abundance than upon the precious political and social freedoms we have retained. Only in the context of such freedoms are the benefits of consumption ours to enjoy.

It is just such freedoms that the "nuclear economy" calls into question. With the spread of dangerous nuclear material, there is no alternative but to increase the degree of government scrutiny over our lives. The threat of terrorism and sabotage

See Myths on page 15

counterpoint

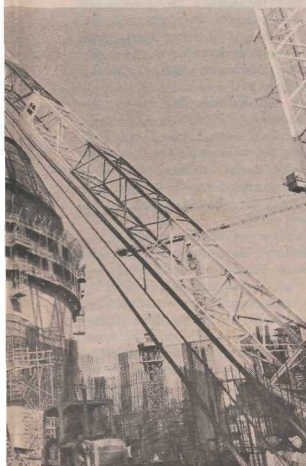
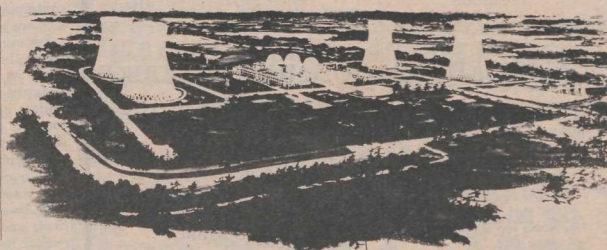


PHOTO COURTESY CP&L

power Plant scheduled for completion in

"With the spread of dangerous nuclear material, there is no alternative but to increase the degree of government scrutiny over our lives."



GRAPHIC COURTESY OF CP&L

Artist's conception of Shearon Harris Nuclear Power Plant.

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...waste

Continued from page 5

When the site was shut down the following year, it contained more than half the commercially-produced transuranic waste in the entire country. It still costs Kentucky taxpayers \$1.6 million to maintain the defunct facility, and it would cost roughly 10 times that amount to put Maxey Flats into decommissioned status.

Regrettably, companies with heavy financial investments in nuclear power have not responded to such costly failures with sound alternatives but rather with large "information" campaigns designed to silence questions from an increasingly informed and worried public. Consider four reassuring "facts" regarding radioactive waste, which advocates of nuclear power now stress repeatedly.

1) "Most nuclear waste comes from the military." Production of nuclear weapons and warships, which began well before the push for commercial

**"More and more experts
now agree that increased
conservation, not
expanded generation, is
the key strategy for
decreasing our energy
needs."**

reactors, has indeed contributed heavily to the current nuclear waste problem, which must be solved, no matter how or why radioactive waste is being created.

The fact is that commercial wastes are now expanding at a far greater rate than military wastes. In comparing these two sources the amount of radioactivity created matters far more than the volume of waste. Harmut Krugmann explained recently, "Although the volumes of the military wastes are very large, they are on the average almost 100 times more dilute than projected commercial high-level wastes." By 1978 the radioactivity of spent fuel rods from commercial reactors was estimated to equal all high-level radioactive wastes from defense sources.

2) "There isn't much waste to be disposed of." In fact, the amount is already huge and growing fast. The Environmental Protection Agency estimates that by the year 2000, U.S. nuclear power sources could generate up to 400 million cubic feet of low-level waste. By that time, reactors alone will be generating 42,000 tons of nuclear waste annually. High-level wastes, containing uranium-235 and plutonium-239, are particularly troublesome.

For every year of operation, a nuclear power plant in the 1,000 megawatt range (such as Duke Power Co.'s McGuire, Catawba and Cherokee facilities, now under construction) will produce roughly 9,000 gallons of high-level liquid waste. The government estimates that within the next 20 years, between 60 million and 200 million gallons of high-level wastes will be created.

3) Almost all reactor waste can be easily and profitably recycled." Spent reactor fuel does indeed have potential value as fuel if reprocessed. President Carter, however, has declared a

moratorium on reprocessing until the procedure can be improved. Meanwhile, the high-level waste is piling up at commercial reactor sites in the form of spent fuel rods.

More than 4,000 metric tons already fill the storage tanks of existing reactors, and there will be a severe shortage of on-site storage capacity by 1985. By that year, according to the Department of Energy, at least 27 American reactors will reach maximum storage capacity. Twelve of these plants are in the South.

Whether or not reprocessing ever becomes feasible, the current interim response involves away-from-reactor storage. Duke Power, for example, has already sought permission to make more than 400 truck shipments of spent fuel from its Oconee reactor in Seneca, S.C., to its McGuire plant near Charlotte. When McGuire Unit One reaches full capacity next year, spent fuel will be shipped to the Catawba plant in Clover, S.C.

4) "The technology for permanent radioactive waste disposal already exists." This is not true. Deep-earth burial of waste in the salt deposits under Louisiana, Michigan and elsewhere appears less and less feasible, despite industry enthusiasm. Not only are states moving to forbid such nuclear treasure troves, but scientists of the U.S. Geological Survey now admit that their own "lack of understanding contributes considerable uncertainty to evaluations of the risks of geological disposal of high-level waste."

In spite of recent claims, "vitrification" does not seem to be a safe alternative. This process of solidifying fission products into glass blocks sounds appealing. When attempted in France, however, the vitrified waste gave evidence of leaching. "Glass is relatively unstable and thermodynamically undesirable," warns Rustum Roy, director of the National Academy of Science's Committee on Radioactive Waste Management.

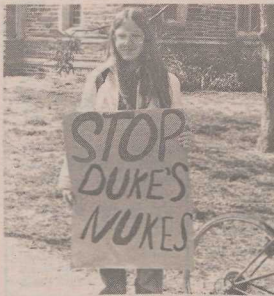
And so the search goes on. We are now creating hazardous garbage at such an unprecedented rate that experts studying the issue are deeply pessimistic. Michael Brown, the journalist who uncovered the Love Canal fiasco, reflects this mood. In his new book, *Laying Waste*, Brown writes bluntly: "After 5,600 federal studies on the disposal problem, no final, guaranteed solution has been reached, and it would be folly to expect one soon."

Editor's note: Peter Wood is an associate professor of history. This article is reprinted with permission of the author and the Durham Morning Herald.



JE ANDERSON - OPS

Wednesday, September 17, 1980



STAFF PHOTO
Duke student protests Duke's ties to nuclear energy.

... moments

Continued from page 6

The NRC report claims that the probability of such an occurrence is small enough to warrant the risk involved, stating, "Of the more than 32,000 hazardous materials transport incidents reported to the Department of Transportation during 1971-75, only 144, or 0.45 percent, were noted to involve radioactive materials. . . . In only 36 of the 144 reported radioactive materials incidents was there any indication of release of contents or excessive radiation levels."

In 1980, after the notification of government about transport incidents involving radioactive materials was made mandatory by law, the EPA reportedly expected a tremendous increase in the number of such reports filed annually.

In any event, just one such accident during the transport of Pu-239, the most common isotope of Plutonium with a half-life of 24,390 years (the time it takes to lose one-half of its radioactivity), would be damaging beyond conceivable terms. The NRC report estimated that shipments of Pu-239 on all-cargo flights will rise from 17 packages per year in 1975 to 182 packages per year in 1985, while transport by truck is estimated to remain constant at 4,030 packages per year during this period.

Transport of packages of Cesium-137, with its half-life of 11,000 days, is expected to rise from 41 packages per year on all-cargo flights in 1975 to 2,920 in 1985. Transport of Cs-137 packages by truck is expected to jump from 31,000 per year in 1975 to more than 80,000 per year in 1985.

Clearly the policy makers at the NRC are making assumptions about the future efficiency of the transport sector and they are manipulating the resources of the American public in the interest of the large corporate utilities.

The NRC report concludes, "The alternative of reducing the amount of radioactive material transported, either generally or selectively, was not considered on the assumption that the benefits associated with the use of presently transported materials outweigh the small risk of their transportation."

The NRC is operating beyond its bounds in determining what amount of risk is acceptable to an American public which not only has to pay for the reparation of damages incurred by the nuclear industry but which must live forever with the shadow of radioactive release by its side.

Editor's note: Joseph J. DiMona is a Trinity senior.
Wednesday, September 17, 1980

... safety

Continued from page 5

Finally there is the reactor dome: an airtight concrete structure with heavy steel reinforcing. These domes are the strongest buildings ever designed.

A key element in reactor safety is the cooling water that keeps the metal around the fuel pins (the first line of defense) from being damaged by overheating. If the pumps that circulate this water should fail, natural circulation and a backup system take over. If the cooling water stops, an emergency cooling system turns on automatically and the reactor is shut down. Nuclear reactors are designed for safety.

Which brings us back to Three Mile Island. With all these layers of protection, how could it have happened?

The most important thing to remember about Three Mile Island is that no one was killed or even injured by radiation. The maximum exposure to a plant worker was comparable to that from a gastrointestinal X-ray examination.

The second most important point about the accident is that the emergency systems worked. The reactor shut down, and the emergency cooling system came on.

"It's the safest choice we have today."

There were errors, both human and technical. The accident showed us problems in the operator-training programs and in communications. Both of these have since been dealt with by the utilities. The accident also pointed out some minor equipment changes that were needed inside the plants. These have been made. So we have learned a great deal about how to make the plants even safer.

The accident was serious. It should have never happened. No accident ever should. But it certainly was not a disaster. Some (perhaps most) of the fuel pins were damaged, but all of the fuel was contained in the steel pressure vessel. The dome is still intact and only small amounts of radioactive steam were released.

Even if the core had melted and gone through the pressure vessel, it would have landed in an enormous pool of water on the floor of the building and been cooled. A "China syndrome" was just not in the making.

In spite of Three Mile Island, the nuclear industry still has an enviable (and unequaled) safety record. In more than 20 years of generating commercial electricity from nuclear power there has been no injury to the public and no serious exposure to radiation of any plant employee.

Is nuclear energy absolutely safe? No. Nothing is. But the risks involved with nuclear energy are small. As small as those associated with generating our electricity from oil and gas (which are not readily available). Much smaller than generating it with coal or hydroelectric power.

Viewed in those terms, is nuclear energy safe? It's the safest choice we have today.

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Duke Technical Services is hiring students to serve as stagehands and technicians for concerts, stage shows, and other campus events. There will be a meeting for interested persons on Tuesday, Sept. 23 at 7:30 p.m. in Page Auditorium. Both undergraduate and graduate students, work-study or non-work-study, are welcome.

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ZAGGY



TOPPIX

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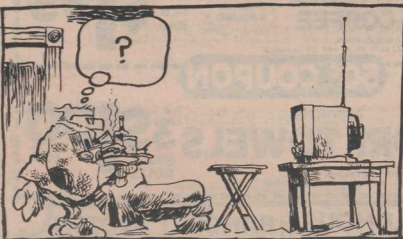
THE Daily Crossword by James L. Beatty

- | | | | |
|----------------|----------------|----|----------------|
| ACROSS | 33 — curtain | 73 | Worthless |
| 1 Get out! | 34 Gather the | 54 | Business |
| 5 Where | leavings | 55 | degree |
| there's | 36 Between | 57 | "Crust law |
| dirty work | A and U | 58 | again the — |
| 10 Armored car | 37 Apprehended | 61 | Treasure |
| 14 Lacerated | with the | 62 | Mountain |
| 15 Water wheel | look | 63 | comb. form |
| 16 To shelter | 41 Feminine | 64 | chest |
| 17 Hardly ever | suffix | 65 | Burnesse |
| 20 Can or tray | 43 Irregulars | 66 | for one |
| 21 — the | 44 — nostrum | 67 | Adominable |
| word | 45 Clipped | 68 | 38 light-horse |
| 22 Worn out | 46 Solid | 69 | Harry |
| 23 Whittish | alcohol | 70 | Ancient |
| 24 Slangy | titles | 71 | status |
| negative | 48 abcr. | 72 | 39 Corner |
| 26 Plucks with | 49 Gently | 73 | 40 Neighbor |
| a plectrum | 50 Pacific | 74 | — of lex. |
| 29 Eastern | island | 75 | 45 Without |
| church | group | 76 | standards |
| diocese | | 77 | 46 Scottish |

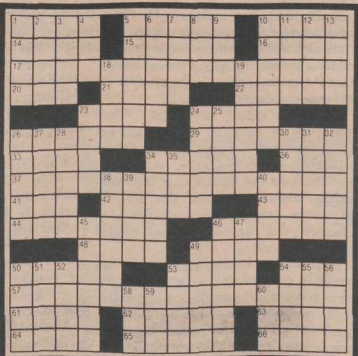
Yesterday's Puzzle Solved:

SHAH SEEN SODIP
LOVE TEMPO ELSE
SATER DOWNS VEEER
DEVIL MAY CARE
MEN WRERS
GALAH SODIP
ALCO GENERA ODE
DOME OTHER EDE
EKO DOWNS
THREAGOD MISTIS
STANDS ALCO
HAPPY LUCKY
DATA GLEOS RUNE
TODL REARS ERIN
MEMO TARA SEIS

SHOE by Jeff Macchelly



PEANUTS® by Charles M. Schulz



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9/17/80

For sons, lovers and gentlemen

films

Office of Continuing Education/Durham County Library: *Sons and Lovers*, part of D.H. Lawrence series, Durham County Public Library, 7:30 p.m.

St. Joseph's Performance Center: *Ugetsu*. Reality and the supernatural blend in this Japanese film directed by Kenji Mizoguchi, today, 7 and 9:30 p.m.

Freewater: *The Big Sleep*, part of Humphrey Bogart series, Thurs., 7 and 9:30 p.m., Bio-Sci.

Freewater: Double feature, *The Green Room* and *Love on the Run*, Fri., 8, 11 p.m., midnight, Baldwin.

Quadrangle Pictures: *Star Trek*, Sat. and Sun., 7, 9:30 p.m., Page.

Durham County Library and Duke University: *I Heard the Owl Call My Name*, part of film and discussion series on the roots of racism, Wed., Sept. 24, 7 p.m., Zener Auditorium.

The Ark: *History of Dance* film, Wed., Sept. 24, 8 p.m.

readings

Open Reading, arranged by *The Archive*, Thurs., 8 p.m., Student Activities building on East Campus.

concerts

Bella Davidovich, pianist, Duke Artists Series, Thurs., 8:15 p.m., Page.

theater

Carolina Union, UNC-CH: one-woman show, *Tamsen Donner: A Woman's Journey*, Fri. and Sat., Gerrard Hall.

UNC Department of Dramatic Art: *Moliere's The Would-Be Gentleman*, Sept. 24-27, 8 p.m., Paul Green Theatre.

Gallery Theatre: *Company*, Fri. and Sat., Sept. 26-28, 8 p.m., The Art School, Carrboro.

The Raleigh Little Theatre: *Bedroom Farce*, today through Sun., Sept. 23-27, 8 p.m.

dance

North Carolina Dance Theater, Triangle Dance Guild, Fri., 8 p.m., Stewart Theatre, Raleigh.

bands

X-Teens, Fri., 9:30 p.m., The Great Escape, 706 1/2 Ninth St.

Luther Moon, today, 7:30 p.m., Duke South Hospital cafeteria.

exhibitions

Gordon Parks: *New Images-Photography*, Duke University Museum of Art, through Sept. 29.

Bette Elliott: *watercolors and acrylics*, East Campus Gallery, through Oct. 3.

Marshal Mash: *photography*, West Campus Gallery, Sept. 23-Oct. 24.

Captured Light and Interiors: *Exteriors*, group shows, Durham Arts Council, through Oct. 2.

Faculty Artists - UNC-CH, Ackland Museum of Art, through Oct. 19.

Artbit

The Photographic Arts Society of Durham is accepting entries for its fifth annual Juried Photo Show, to be judged by Gordon Parks, internationally known photojournalist, writer, and director. The show will open Oct. 1. The deadline for entries is Sat. at the Durham Arts Council, 120 Morris St. Purchase awards and stipends for one-person shows will be given. Entries are limited to 4 prints per person.

It might be a little copy, Scott, but let's see if we can't all agree to it. Thanks, Fern. I love it! (even without the braids). Erica (too bad the Aeolus doesn't work after it's printed). Annette, Rob, Judy, Linda, MGA, and various other support sent via the moon. Long days and long nights. This is your NE Susan. Don't ask you what you'll remember?

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Sun. Mat. 1:25, 3:20, 5:25



Daylight Savings Time

Attention Bag fans: the original of last week's cartoon has disappeared. If it is not returned, neither will Thaddeus and Lou. Please bring it to the Chronicle office and place in the trusty hands of a Chronicle or Aeolus editor. REWARD offered: an original Thad and Lou cartoon!

Interested in learning to
TYPE?
ASDU is offering Typing 1.

Classes begin October 1
3:00-4:25
Tues., Wed. & Thurs.
at Durham Tech.
Transportation will be provided.

Register in the ASDU office
by Friday, Sept. 19
(limited spaces, so register early!)

Wednesday, September 17, 1980

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• Choice Steaks • Fried Chicken

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GET INVOLVED:

ASDU is taking applications for the following committees:

Afro-American Studies	Student Health Advisory Board
CAPS Advisory Board	Summer Transitional Period
Duke Environmental Concerns	Undergraduate Teaching Council
Educational Facilities	WDBS Board
Handicapped Students	WJDUK Board
Jordan Center	Library Council

Social Implications of Duke Stock Investment

Ad Hoc UFRS Committees:
HEALTH SCIENCE EDUCATION
OFFICER EDUCATION
SELECTION COMMITTEE FOR EVALUATION OF TEACHING

Applications are available in 104 Union
from Monday, Sept. 15 thru Friday, Sept. 19

The *Archive* invites you to a Housewarming!

Thurs. Sept. 18 8:00 P.M.

Wine, Cheese, Reading

East Campus Center

(white building between Carr and tennis courts)

Bring your poems and prose!

The *Archive* is accepting poems, prose, plays,
and artwork for the Fall 1980 issue. Send

SASE to **Box 4665, Duke Station**
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or come by **203 East Campus Center**

Deadline — Oct. 10!

Conference on Career Choices

Interviews for

Committee Chairmen

- Campus Coordination/Public Relations
- Food/Entertainment
- Accommodations/Transportation
- Alumni Selection
- Morning Conferences
- Afternoon Conferences and Treasurer

Sign up now at the ASDU office, 104 Union

Interviews will be Wednesday & Sunday

CCC

Devils meet Guilford

By Jon Scher

After playing like pros over the weekend — taking the Mayor's Cup away from North Carolina on the Tarheels' home turf — and gaining a national ranking, what's next for these guys?

Today's home game with the Guilford Quakers (3:30 p.m.) is the latest hurdle the Blue Devils must clear on the road to their showdown with Clemson September 28. Duke coach John Rennie acknowledged the possibility that his team might suffer a letdown in playing a smaller opponent on the heels of their big success.

"We play three teams we can beat before the Clemson game, he said. "Hopefully, we can look ahead and still recognize what would happen if we did have a letdown."

Rennie is familiar with the Guilford coach, Tim Morse, but he really doesn't know what to expect from the Quakers this afternoon. Duke was only able to squeak by with a 1-0 victory over Guilford last season, with the lone goal coming late in the second half. To live up to their current lofty position, the Devils must produce substantially better than that today.

"I know we're not playing as well as we can yet," said Rennie. That statement is bound to worry some of the teams which the Blue Devils have yet to play this season.

"Last weekend was a start, but that's all it was, a start," he said.

If the Devils are to improve prior to facing Clemson, they must begin with today's match against Guilford. They also will have to do it without freshman Roger Jeffs, who injured a leg during tournament play and will be out indefinitely. Midfielder Graziano Giglio, however, has apparently returned to full

strength. Giglio scored the tournament-winning goal against UNC Sunday.

Devils ranked

For the first time in Duke soccer history, the Blue Devils broke into the Intercollegiate Soccer Association of America's weekly rating of the nation's top 20 teams yesterday, earning 31 points for the 16th position.

The ranking was partly a result of Duke's championship in the Mayor's Cup last weekend, where the Blue Devils upended North Carolina State and North Carolina.

Clemson, Duke's opponent on September 28, retained its number one ranking with 15 first place votes.

ISSA Division I Top 20

(first place votes in parentheses)

1. Clemson (15)	315
2. San Francisco (2)	275
3. Alabama A & M	249
4. Indiana (1)	241
5. Southern Illinois (2)	223
6. Connecticut (1)	222
7. Philadelphia Textile	175
8. Columbia	147
9. Southern Methodist	126
10. American	122
11. Wisconsin-Milwaukee	106
12. UCLA	96
13. Rhode Island	91
14. Navy	50
15. St. Louis	35
16. DUKE	31
17. Cleveland State	30
18. Adelphi	29
19. North Texas State	16
20. Princeton	15

National League

Montreal 5, New York Mets 2
Pittsburgh 3, Philadelphia 2
Atlanta 2, Los Angeles 1
San Diego 4, Houston 3
San Francisco 8, Cincinnati 1
Chicago 6, St. Louis 5

American League

New York 5, Toronto 4
Detroit 8, Baltimore 3
Boston 9, Cleveland 5
Minnesota at Milwaukee (2) ppd.
California at Kansas City ppd.
Oakland at Texas, late
Chicago at Seattle, late

O'Koren signs

Mike O'Koren, former All-American forward from North Carolina, signed a four-year, \$1 million contract with the New Jersey Nets of the NBA Monday.

O'Koren, who was picked sixth in last spring's NBA draft, joins former Duke center Mike Gminski on the Nets team. Gminski signed last week, but the terms of his contract were not disclosed.

Sportsweek

Today

Soccer vs. Guilford in Durham at 3:30 p.m.

Thursday

Men's golf in the Yale Invitational in New Haven, Ct.

Friday

Women's tennis vs. Maryland in Durham at 1 p.m.

Men's golf in the Yale Invitational in New Haven, Ct.

Saturday

Football vs. Auburn in Auburn, Ala. at 2:30 p.m.

Cross-country vs. Davidson and South Carolina in Davidson, N.C.

Soccer vs. UNC-Charlotte in Durham at 1 p.m.

Women's tennis vs. Wake Forest in Winston-Salem, N.C.

Men's golf in the Yale Invitational in New Haven, Ct.

Sunday

Women's golf in the Lady Mountaineer Classic in Boone, N.C.

Field hockey Club Day in Durham at 10 a.m.

Monday

Women's golf in the Lady Mountaineer Classic in Boone, N.C.

Tuesday

Volleyball vs. Appalachian State in Cameron Indoor Stadium at 7:30 p.m.

Field hockey vs. Catawba College in Salisbury, N.C.

Women's golf in the Lady Mountaineer Classic in Boone, N.C.

Wednesday, September 17, 1980

Classifieds

IMPROVE YOUR GRADES!
Research catalog — 306 pages — 10,278 descriptive listings. Rush \$1 (refundable). Box 25097C, Los Angeles, 90025. (213) 477-8226.

For Sale

Good Inexpensive Used Furniture. Guess Road Furniture, 3218 Guess Road (on right, near Carver St.) Open 5-8 p.m. weekdays, 10-6 Sat., 2-5 p.m. Sun. 471-2722.

GUESS ROAD USED FURNITURE. Good inexpensive used furniture, 3218 Guess Road. Open weekdays 5-8 p.m., Sat. 10-6, Sun. 2-5. 471-2722.

For Sale — Exxon gas regular \$1.14/10. Unleaded \$1.21/9.10. High test \$1.25 9/10. Couch's Exxon, 1810 W. Markham across from Couch's Kwik Kar Wash near East Campus. Special: \$1 off on car wash with 5 gal. minimum purchase of gas.

GUESS ROAD USED FURNITURE. 3218 Guess Road (next to Pilot Life Ins.). Good, inexpensive used furniture. Open weekdays 5-8 p.m., Sat. 10-6, Sun. 2-5 p.m. 471-2722.

Firewood for sale. Hardwoods split & delivered. \$88/cord; \$45/half cord. 688-5385.

Altec-Lansing design 10 loudspeakers. 2-way with 10" woofer. 3 years old with 5 year warranty. \$100/pair. Cal Mark at 684-1313.

For Sale: 1 yr. old 19" Sears color TV. Call x-7997.

Wanted

Wanted: Non-smoking males as subjects in paid EPA breathing experiments on the UNC-CH campus. Total time commitment is 10-15 hours, including a free physical examination. Pay is \$5/hr. and travel expenses are reimbursed. We need healthy males, age 18-40 with no allergies, and no hay fever. Call Chapel Hill collect for more information, 966-1253.

Wanted: Dorm-size used refrigerator in good condition. Limited budget. Call Bill, 286-3386.

WANTED: Any type or speed bicycle that has 2 good tires, brakes, and works! Must be cheap. Call Jennifer, 688-4161.

SL130Roommate Wanted

Housemate Wanted: 2 bedroom, 2 bath apartment, yard, patio, large living room. Live with female grad student. Call Whitney, 477-1291.

DRUMMERS!! Guitarist (11 yrs. exper.) seeks drummer to round out new wave/reggae/rock band. Call 286-3634.

Found

Glasses found on East Campus lawn. Brown plastic rims with photo grade lenses. Call Rich at 286-4986.

Medium-sized BLACK DOG with tan markings found on Duke Campus, 9/5/80. Tan collar, no tags, Call 489-4932, evenings.

Lost

LOST: Black wallet in BOG. Many valuable, hard to replace items. Credit cards have been invalidated. NCMB card — useless. License, registration, etc. badly needed. Medical information, cards — great importance to my health. Keep cash — just return remainder, PLEASE. Call 684-0950.

LOST: 2 turquoise rings — 1 turquoise and coral bird on silver band, 1 silver band with turquoise and quartz triangles. Sentimental value. Call Melissa, x-7455.

REWARD for return of silver pen with my name engraved on it. Lost near Allen Building. Call Jane, x-0006.



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For: Seminars on how to use the
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When: Week of September 15
Time: Sign up NOW in 214 Flowers

...Energy

Continued from page 8

force would mean far more coal. In the year 2000 the train would have to stretch five more times around the earth!

Even if we were willing to see the ground ripped open by mines and our rains turned to acid by the gases going up the smoke stack, we just can't do it.

But neither will nuclear energy do it alone. Nuclear power plants generate electricity, and electricity is useful for many purposes. It lights our homes, runs our appliances and supplies energy to many of our industries. But it won't run our automobiles or our steel plants or our airplanes.

Nuclear energy could supply much of the energy needed for new jobs. It could replace the oil now used to generate electricity (about one-fourth of our imports). It could replace more if we used electric cars and railroads for transportation. But even if we could

build reactors fast enough and get them licensed, nuclear energy could never do it all.

Where does that leave us? It leaves us continuing to use hydroelectric power and domestic oil. It leaves us conserving energy in every way we know how. It leaves us developing new technologies such as solar energy. But mainly it leaves us depending to a greater and greater extent on our two available domestic resources, coal and uranium.

If we do all these things, the millennium can dawn on a free, comfortable, prosperous society with new energy sources ready to be used. If we fail to do them we will at best be suffering severe economic hardship and at worst have been the victims of a nuclear war fought over dwindling oil reserves.

The choice is ours. The legacy belongs to our children. □

...Myths

Continued from page 9

is so great that the government would have no alternative but to keep its eye on all potential troublemakers.

A House subcommittee staff report indicates that already there are more than 50 tons of fissionable material unaccounted for by the 34 processing plants in the country — and three tons is of weapons-grade fuel. The threat to public safety that this material poses is immense. The government response is inevitable; increased security and decreased freedom. It is the only option that a nuclear society has.

As Richard Barnett concluded in a recent study, "The result could be a

degree of surveillance, centralization and governmental intrusion which would cause us to remember America of the 1970s as a laissez-faire paradise."

The issue of whether to develop nuclear power or to follow other "soft" options is a crucial one for our society. The future of our way of life is at issue. The central threat to that life is posed, however, not by the advocates of the so-called "appropriate technologies." If we do follow the nuclear path, Orwell's vision of a totalitarian society in 1984 may turn out to be more fitting than we dare admit. □

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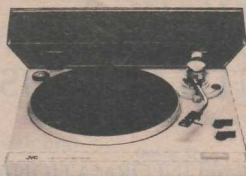
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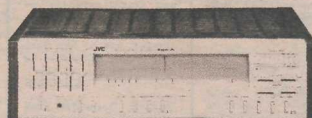


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Ideal for that first system or as
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90 minute chrome bias tape,
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