

stories/day		DATE	Stories and Cutlines	(75) Locals	(25) Reg. Dailies	(39) Reg. Weeklies	(16) 50 M's	(26) Reg. Radio	(15) X-List	(15) Adj. Counties	Hometowners	PSA's	Ag list	(16) Ag boxes	MISC. (#)	CONTACT	feature	REMARKS
2-9-87	29																	
2-10-87	4																	
2-11-87	11																	
2-12-87	6																	
2-13-87	3																	
1-2-9-87			growth												2	slp	✓	
2-2-9-87			wheat												2	slp	✓	
3-2-9-87			social												1	ht	✓	
4-2-9-87			myco												2	ht	✓	
5-2-9-87			research (caption)													ht		
6-2-9-87			cotton	168	✓	✓				✓		22	✓	✓	2	ht	✓	15 textile
7-2-9-87			chips 2												2	pl	✓	
8-2-9-87			urban 2												2	pl	✓	
9-2-9-87			SPT												2	pl	✓	
10-2-9-87			archcap 2													pl		planned print
11-2-9-87			archcap 3													pl		"
12-2-9-87			archcap 4													pl		"
13-2-9-87			archcap 1													pl		"
14-2-9-87			arch. (caption)												2	pl		
15-2-9-87			arch 1. (caption)													pl		
16-2-9-87			arch 2. "													pl		
17-2-9-87			arch 3. "													pl		
18-2-9-87			arch 4. "													pl		
19-2-9-87			arch 5. "												2	pl		

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DATE	Stories and Outlines	(75) Locals	(25) Reg. Dailies	(37) Reg. Weeklies	(16) 50 M's	(26) Reg. Radio	(15) X-List	(15) Adj. Counties	Hometowners	PSA's	(16) Ag list	(16) Ag boxes	MISC. (#)	CONTACT	REMARKS
39-2-11-87	feedlot (caption)												2		
40-2-11-87	dads	75	✓											slp	
41-2-11-87	exercise	148	✓	✓				✓						ht	✓ ³³ Bacons
42-2-11-87	newscon	75	✓											pl	
43-2-11-87	cows	25	✓									1		slp	
44-2-11-87	theatre	20										5		kh	
45-2-13-87	computer	183	✓	✓	✓			✓				2		ht	✓ ¹⁰ education / ⁴² Bacon
46-2-12-87	tip													div.	
47-2-12-87	doctory											2		slp	✓
48-2-12-87	Complab	188	✓	✓								2		kh	✓ ⁵⁴ Bacons / ¹⁴ home ec / ¹⁹ restr.
49-2-12-87	home cc computer											2		kh	
50-2-12-87	wade	115	✓	✓				✓						ht	
51-2-12-87	merkel	90	✓					✓						kh	
52-2-12-87	matching	75	✓											pl	
53-2-13-87	comp.		✓	✓	✓			✓						ht	✓ education / Bacon
54-2-13-87	cowcycles	192	✓	✓	✓			✓			35	✓	✓	slp	✓ freelance

CONTACT: Sally Logue Post

1-2-9-87

Lubbock's future economic development depends upon the emergence of a large, strong and viable high-technology industry.

Texas Tech University economics Professor Lewis E. Hill said that while the high-technology sector of Lubbock's economy represented by Texas Instruments Inc. is troubled, it is the area where future growth lies.

"The bright prospects of the 1970s for the development of Lubbock as a center of high-technology industry have been replaced by a somewhat doubtful outlook, but Lubbock continues to offer significant advantages to this industry," Hill said.

Lubbock offers high-technology companies the presence of a major, research-oriented university, the availability of adequate personnel ranging from professional levels to semi-skilled assemblers and good transportation facilities, he said.

As for agriculture, the mainstay of Lubbock's economy, Hill said Lubbock must secure an adequate supply of future water. Current supplies, he said, will be unable to support the demand of anticipated growth in the coming years.

"Another economist, several years ago, noted that by the year 2000, either Lubbock would be a city of 250,000 or there wouldn't be enough water to flush the comodes in the high-rise dormitories on the Texas Tech campus," Hill said.

The agricultural sector has also had to endure a decade of depression and, according to Hill, faces even more difficult times. Not only has export demand for American farm products failed to support prices adequately, but also fuel costs are escalating so rapidly that irrigation is uneconomical and self-defeating.

"Irrigation not only uses the declining underground water, it actually increases the farmer's problems by simultaneously increasing his costs and causing overproduction that gluts the market and reduces prices."

Hill says that for agriculture to again contribute significantly to the economic growth of the Lubbock area, a new foundation must be developed.

"Dry-land cultivation must become the norm, new drought resistant crops must be developed," he said.

Hill also said there are some crops such as vegetables and fruits, especially grapes, that have enough value that irrigation may still be practical. However, he notes, the feasibility of these crops may require development of new water conservation and irrigation techniques.

Energy, another major part of the Lubbock economy, has also experienced hard times in recent years. Since the oil embargo of 1973-1974, Lubbock and the South Plains have shared with the remainder of the U.S. energy problems which are as difficult as they are important to resolve, he said.

"This is a national problem that Lubbock cannot solve separately from the rest of the nation," Hill said. "But, Lubbock must make peace with the situation by securing an adequate supply of energy at a reasonable cost."

The health care industry, which has become a major industry in Lubbock, also faces an uncertain future, Hill said. Current hospital construction will expand the bed capacity from about 1,500 in 1980 to about 2,000 by the end of the decade. The average cost of those new beds is about \$200,000, which compares to \$12,500 in the early 1950s.

"The industry is in danger of pricing elaborate and sophisticated health care beyond the ability of many patients and beyond the willingness to pay of their third-party payers," he said. "Increasing costs could result in patients reducing the duration of hospital stays or seeking less expensive systems of care. The final result could be a costly underutilization of excess capacity."

The problem with bringing new industry into Lubbock is the fierce competition between cities for these companies.

"If Lubbock is to meet this increasingly vigorous competition and succeed in attracting industry, two conditions must prevail," Hill said. "First, there must be close cooperation among the city, the chamber of commerce, the Board of City Development and the university. Second, the methods used to attract high-technology industry must be innovative and aggressive."

Hill said that to attract new economic growth, Lubbock must develop programs to attract industry that are based on comparative advantage -- the ability to produce a product at a minimal opportunity cost. While vigorous and effective promotional programs must be an important part of attracting business, Hill says that alone won't be enough.

"The time has long since passed when cities could achieve economic growth and development through hard-sell promotional programs alone," he said. "Lubbock has to not only define and develop its comparative advantage, but also promote its economic development program with deep insight and great vigor."

CONTACT: Sally Logue Post

2-2-9-87

Uncovering the genetic mechanisms that could maximize wheat and sorghum yields in arid or semi-arid areas may offer hope for the survival of farmers on the High Plains, according to Professor Henry Nguyen of Texas Tech University.

Dr. Nguyen, a plant geneticist in the Department of Plant and Soil Science, is working with the physiological and biochemical mechanisms of both wheat and sorghum that allow the plant to grow best under low water and high temperature conditions.

"Once we know the genetic systems that make plants drought resistant and heat tolerant, we can develop those features so the crops planted in Texas will produce better yields," Nguyen said.

Because Texas ranks second behind Kansas in wheat production, Nguyen's work is important to many farmers. In 1985 on the northern and southern High Plains combined, 1.5 million acres of sorghum and 3.6 million acres of wheat were planted.

"When you consider that 80 percent of the wheat and about 65 percent of all sorghum is dryland farmed, it is important to develop cultivars or hybrids that produce best with a minimum of water," he said.

Nguyen, who was named Texas Tech's first Presidential Young Investigator by the National Science Foundation in 1986, said his work concentrates on developing the technology and germplasm for use by plant breeders who will produce the final seed varieties for the farmers.

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In addition to traditional laboratory, greenhouse and field experiments, he is using cell culture and gene cloning techniques for selecting heat and water stress resistant characteristics.

"Once we have the biotechnology necessary to identify the specific genetic makeups we need, we can develop ways to transfer those characteristics from one plant to another," Nguyen said.

Nguyen is also looking at the exotic cousins of domestic species to see how those plants are able to survive in the even more arid and hotter areas of the world.

"Wheat and sorghum are not native to the U.S.," he said. "We need to look to their ancestors in the Middle East, Southwestern Asia and Africa to see if we can determine what makes those plants grow in conditions worse than we have in the U.S. This work not only helps us in the lab, but also in bringing about collaboration with scientists in other countries that will bring an international scope to our work."

Nguyen's work is part of plant and soil science's Biotechnology Program and the College of Agricultural Sciences' Plant Stress and Water Conservation Research Program that involves scientists from the Texas Tech departments plant and soil science and biology, the United States Department of Agriculture and the Texas Agricultural Experiment Station.

CONTACT: Beverly Taylor

3-2-9-87

A genetic tendency to cooperate with family members and the disintegration of small, isolated communities may be putting the privileged and underprivileged increasingly at odds.

Texas Tech University biology Professor Ronald K. Chesser predicts underprivileged groups will begin exerting more and more pressure for equal distribution of resources -- money, education, political power and opportunity -- because of the conflicting influences of genetics and a changing society.

Dr. Chesser, who studies social behavior in animals to predict how genetics could affect man's social behavior and vice versa, said man and other animals have a genetic tendency to cooperate for mutual benefit with those who are closely related to them.

Cooperation is linked to the innate struggle of man and animals to ensure their survival and that of their offspring. In cooperating, Chesser said, individuals are subconsciously working to make sure their genetic traits are represented in future generations.

"In past societies when closely related people lived together in small, isolated groups, a lot of cooperation was exhibited," said Chesser. "If you cooperate with someone who shares a lot of your same genes -- your close relatives, then you are actually helping propagate your own genes. The ones who cooperate have greater success; they are more genetically fit because more of their genes are represented in the next generation."

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"Human behavior is much more complex than animal behavior, but we can draw some conclusions," he said. "Animals aren't just running around out there bumping into each other by chance. Mammals and birds, in particular, live in highly organized social groups with others who are genetically related to them."

But, as society becomes more mobile and disintegrated and people do not have close contact with relatives, man is losing the genetic reinforcement for cooperation, Chessser said.

"We do have loyalties -- to our city, state and country -- but in the past we were genetically reinforced for that loyalty because we would have been more genetically related to individuals in power," Chessser said.

The result, he said, is a general attitude of uncooperativeness as man tries to adjust genetically to a changing society.

"Genetically, we are products of the social organization of past generations," Chessser said. "We are always hundreds of years behind and trying to catch up. One of the biggest changes of the past several hundred years has been in social organization."

Man is under extreme evolutionary pressure to conform to the changes in society, particularly urbanization and dilution of the extended family, he said.

"From an evolutionary standpoint, our body is just the package for passing on genes," he said. "Our genetic material is what makes us successful as far as reproducing and, therefore, influencing the future."

The move away from genetically reinforced cooperation could mean either of at least two things will happen, Chessser said.

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Society could regress to a more primitive organization in which closely related individuals lived in isolated communities. For that to happen, Chesser said, the population would have to be considerably smaller and the economic base and political structure would have to change drastically.

More likely, in his opinion, is a fight for changes in how resources are distributed in society.

"The greater the disparity in distribution of resources -- money, political power, education and opportunities for offspring to be integral parts of society -- the greater the competition for those resources will be," Chesser said. "The have-nots will increase pressure on the haves for resources to be distributed more evenly."

The more closely individuals are related, the stronger the biological drive for cooperation among them will be. The high degree of mothers killing offspring of others in prairie dog communities is an example of that, he said.

"Even though the other infants are closely related to them, the mothers try to ensure survivorship of their own -- those who are most closely related to them -- especially in times of low resources," Chesser said. "If there is not enough for everyone to survive, the mother will do everything she can to make sure her offspring are among the survivors."

Genetically propagated cooperation, or the lack of it, is one explanation for the greater incidence of child abuse by step-parents than biological parents, he said. A step-parent is not closely related to a step-child and reacts to the child much differently than if the child were genetically related.

CONTACT: Beverly Taylor

4-2-9-87

You feel terrible. Your body aches, you have a slight fever and chronic cough. After several days, you finally see your doctor who may prescribe antibiotics without being totally certain what is wrong with you.

The physician has a good idea what you have is infection with *Mycoplasma pneumoniae* or "walking" pneumonia, a bacterial infection which can, for weeks at a time, keep you feeling run down but usually not quite sick enough to stay in bed.

But, unless the physician grows a culture from a throat swab or drainage, he cannot be sure whether or not an upper respiratory infection is due to *Mycoplasma pneumoniae*.

The problem is that the mycoplasma bacteria takes two to three weeks to grow in culture. By then, the infection will likely have run its full course.

Hal S. Larsen, a medical technology professor in the Texas Tech University Health Sciences Center School of Allied Health, is working on a diagnostic test which will tell a physician within a day or two whether mycoplasma bacteria are responsible for the patient's lingering symptoms.

"If the physician took a culture for mycoplasma and waited until it was known exactly what the patient had before beginning any treatment, the infection would have already run its course," said Dr. Larsen. "The patient would have gone through weeks of feeling bad which might have been reduced to a few days."

So, the physician sometimes prescribes an antibiotic hoping it will help fight the infection.

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The antibiotics will help if the doctor is correct in guessing mycoplasma are the culprit, but if the infection is viral, said Larsen, the antibiotics are useless.

"Antibiotics are not effective in treating a viral infection. It just has to run its course," Larsen said. "If the physician doesn't know if an infection is viral or due to mycoplasma bacteria, the assumption is usually made that it's viral as the vast majority of respiratory infections are due to virus. But, if they can prevent their patients from dragging around and feeling bad for two or three weeks, they want to."

"Physicians want to know that what they are treating is what the patient actually has," Larsen said. "Of course, if the patient doesn't need antibiotics, he really shouldn't take them."

Usually no harm is done if the doctor is wrong in prescribing antibiotics, Larsen said, although antibiotics can destroy useful bacteria along with the targeted ones.

Untreated *Mycoplasma pneumoniae* can turn into a serious respiratory infection, but usually it is not dangerous and only causes individuals weeks of feeling bad and possibly missing school or work.

Even if it only affected a few individuals, it would concern doctors, but Larsen said a study of Texas Tech students seeking treatment for respiratory problems at Student Health Services revealed that at any one time up to 12 percent of the cases grew *Mycoplasma pneumoniae* in culture.

"That's a lot higher than we thought it would be," Larsen said. "*Mycoplasma pneumoniae* runs in cycles, with a big outbreak every three to four years. Elementary age children to 20-year-olds are most susceptible, so this is a very important thing for schools and colleges."

With funding from Cetus Corp., a California biotechnology firm, Larsen has designed a diagnostic test using monoclonal antibody technology -- a method of producing agents which indicate the presence of particular organisms. Thus, the monoclonal antibodies act in a characteristic way when mycoplasma are present.

The test indicates within 24-48 hours whether mycoplasma are present.

Larsen is now working to expand the test to make it indicative of several organisms simultaneously -- such as mycoplasma, influenza and streptococcus or strep throat.

"From the clinician's standpoint, a test like this would be very beneficial. It would be quick and easy to administer and it would provide lots of information about the patient."

Larsen also hopes to learn whether the mycoplasma bacteria plays a role in respiratory infections other than pneumonia. Sore throats, for example, are usually due to viruses and thus are not treatable with antibiotics. If, however, some sore throats are due to mycoplasma, they could be treated.

"It's impossible to tell a viral sore throat from a bacterial sore throat just by looking," Larsen said. "It would be helpful for physicians to know if a sore throat or other respiratory infection is viral or bacterial."

Dr. Murdo MacDonald, director of Student Health Services, has worked with Larsen by providing samples and data from Texas Tech students who visit the clinic.

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5-2-9-87

LABORATORY COTTON--In 1985 Texas Tech biologists opened the door for a whole new kind of cotton research when they grew cotton fibers from single cells in the laboratory. Arts and Sciences Dean J.R. Goodin and former graduate student Norma Trolinder discuss the applications of their finding. (TECH PHOTO)

Texas Tech News

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CONTACT: Beverly Taylor

6-2-9-87

LUBBOCK--Questions that couldn't even be asked by studying field-grown cotton may someday be answered in research with laboratory-grown crops.

In September 1985 when Texas Tech University biologists announced that for the first time cotton fibers had been grown in the lab from single cotton cells without growing any other part of the plant, they received international attention for the scientific breakthrough.

They had planted the seed for a totally new way of studying cotton production and quality by using the test-tube cotton as a research tool. Answers to questions which can now be posed may result in improved cotton.

"In the past, we would go into the field and inject a cotton boll with a certain kind of chemical to study fiber development," said Jerry D. Berlin, chairman of the Department of Biological Sciences who along with J.R. Goodin, dean of the College of Arts and Sciences, heads the cell culture research. "We really had no idea what we had done to the cotton plant, but it was the only way available to study fiber development.

"Using this new research tool, we can do numerous experiments with cells developing in culture in the lab. It's a new way to look at the differentiation and growth processes."

One of the first areas they will study is the initiation of elongation process through which cotton fibers begin growing from the seed.

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"Before the initiation of elongation, the cells are just sitting there and then the cell gets a little nub which gets bigger and bigger," said Dr. Berlin. "This is the initial stage of development of a cotton fiber."

In a cotton plant growing in the field, only one in 10 cells initiate elongation and become cotton fibers, he said. But in culture all cells elongate.

"In the real plant many cells which have the potential to become cotton fibers don't," Berlin said. "We want to know what causes some cells to initiate elongation and others not to. If we could even get it down to where one in nine cells produce a cotton fiber, we could increase production by 10 percent."

In the second stage of fiber development -- actual elongation -- a fiber begins to grow out from the seed. One end of the fiber remains connected to the seed and elongation essentially occurs at the other end of the fiber, Berlin said.

"In culture, both ends elongate. That's not important as far as changing the plant because in real plants one end of the fiber will always be connected to the seed. But the discovery suggests that the fiber has the ability to regulate its own elongation rather than being regulated by the seed."

If genetic research were conducted to try to stimulate plants to produce longer fibers, the efforts might be focused on the fiber itself because of this finding, he said.

In the third stage of fiber development the fiber thickens as it takes on a secondary cell wall -- the cellulose which is the bulk of the fiber produced.

"Fiber characteristics such as length and diameter which determine cotton quality and price are related to the amount of secondary cell wall present on the fiber," Berlin said. "Cotton fibers are very heterogenous -- they vary greatly from one fiber to the next. Farmers, especially in West Texas where nonuniformity is particularly high, lose money in the marketplace because of variations in quality.

"It's impossible to make a nice, uniform fiber when you don't understand the stages of elongation and secondary wall deposition. We can study these factors now and maybe someday control fiber characteristics."

The work is also important, Berlin said, because it allows a glimpse at the regeneration process. Individual cotton cells, like the cells of most complex plants and animals, contain all the genetic material necessary to reproduce a whole new organism. Cells from the leaf, root or seed of a cotton plant can be made to produce cotton fibers.

"We can regenerate the whole cotton plant from a single cell. We haven't been able to do that with animal cells," he said. "We don't understand what triggers the regeneration process in plants but we can do it."

CONTACT: Preston Lewis

7-2-9-87

The production of microchips -- the computer component which has helped improve the efficiency of the industrial world -- is still one of the most inefficient processes in world industry.

With a success rate averaging one good microchip for every three manufactured, the industry must overproduce by two-thirds just to meet its needs.

What makes the manufacturing process particularly frustrating and expensive, reports Texas Tech University chemical engineering Professor Russell Rhinehart, is that no reliable way has been devised to test microchips during production.

"Since in-process methods do not exist for intermediate product performance testing after each step, the devices are tested after several days' fabrication has developed a testable structure," Rhinehart said. "If a bad step on an early day of processing caused wholesale device failure, several days of subsequent processing would be unnecessarily invested."

Rhinehart, whose research is part of Texas Tech's Productivity in High Tech Manufacturing project funded through the Texas Advanced Technology Research Fund, is studying ways that the chemical processes which are used to etch microchips can be monitored to produce more micro-hits than micro-misses.

The etching of microchips is a complicated and expensive process that begins with a single crystal of silicon which is thinly sliced to produce a "wafer." This wafer -- about six inches in diameter -- becomes the base upon which as many as 100 to 500 microchips can be built.

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The wafer is coated with various layers of metals or oxides, each with varying electrical conducting properties. This process is done a layer at a time and if the layers do not form properly, the microchip will malfunction even if all subsequent layers are fine, Rhinehart said.

The layering process starts with a thin coat of a metal or oxide like silicon dioxide. That layer is then coated with a photoresistant chemical and exposed to a circuit pattern in a process similar to how photographic paper is exposed to a negative to create a photograph.

After that, the wafer is treated with a fluorine plasma to etch away the portions of the silicon dioxide exposed to light. If the etching is stopped too early or allowed to go too long, a defective microchip will result, Rhinehart said. Once the etching is completed, the photoresistant chemical layer is removed and the process is repeated for each subsequent layer.

"The critical electrical properties of an integrated circuit," Rhinehart said, "are directly dependent on the quality and control of the etching process."

The manufacturing time for a typical 15-layer device or microchip is about 60 days, he said.

"On a new chip being produced for the first time, manufacturers are really pleased if they can turn out 10 percent good chips," Rhinehart said. "Eventually they can turn out one good one of every three but it is more by guesswork than precision measurement."

"What we are trying to do is to apply chemical engineering techniques to understand the chemical processes so we can control them," he said.

Rhinehart uses a cooking analogy to illustrate what his research is seeking.

If you bake bread by the recipe, he said, you simply put the ingredients together, put the loaf in the oven at the proper temperature and take it out when the baking time is up.

But without checking the bread periodically, each loaf will differ because of variances in oven temperature, baking time or the amount of ingredients. However, if you watch each loaf through an oven window, you have a better chance of getting more uniform bread.

"We're wanting to get information from the chip process while it's 'cooking,'" Rhinehart said.

To do this Rhinehart and his associates are studying the light that is given off during the etching process. This light changes colors as the acid eats into the metal or oxide layer because the chemical composition changes during the reaction.

By measuring these color changes and correlating them with a computer-generated chemical concentration profile, Rhinehart can tell how far along a reaction is and stop it when the proper color is given off for the desired level of etching.

"This will allow us to 'look in the oven' regularly and see how it's etching," Rhinehart said. "Knowing that, we'll know when to stop etching. Being able to do that could ultimately save industry millions of dollars."

CONTACT: Preston Lewis

8-2-9-87

Too many municipalities, particularly in the Southwest, are letting too much water go down the drain -- the storm drain.

Municipalities need to consider storm water as an asset instead of a liability, reports Lloyd V. Urban, acting director of the Water Resources Center (WRC) at Texas Tech University.

"Traditionally, storm water has been considered something that should be gotten rid of as cheaply and quickly as possible without disrupting personal convenience and traffic," Urban said. "Cities, especially in the Southwest, must learn to recognize that water in virtually any condition is a potential resource."

Putting that storm water to use will require adopting a new concept about water management and an old conservation method, Urban said.

"Cities need first to look at their water management comprehensively and at the interaction of all components -- potable water, storm water and wastewater," Urban said. "Then they need to redefine what's been considered a problem so they can maximize the benefit from all resources."

"If you attempt only to solve one problem in the total water equation," he said, "you are likely to create another."

Storm water is the biggest deficit in the water equation when its potential use is weighed against its actual use. If more of this water were saved instead of going down storm drainage systems, it could provide a supplemental water source and even lower the public cost of building and maintaining drainage systems.

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The magnitude of the storm water resource can be shown in the hypothetical case of a medium-size city with 180,000 population, with a surface area of approximately 50 square miles and with an 18-inch annual rainfall. If two-thirds of the city's total annual rainfall could be saved, it would be more than enough to satisfy an average per capita consumption of 150 gallons per day.

"By capturing and storing significant quantities of storm water for landscape maintenance in residential areas, peak demands could be reduced, water conserved and many storm water management problems mitigated," Urban said.

To capture this runoff water, Urban encourages developers of new municipal subdivisions to consider a modified version of a centuries old conservation method -- the cistern.

In new subdivisions, developers could install a 6,000- to 10,000-gallon storage tank under the house or driveway, equip it with a pump and connect it to a lawn sprinkler system. Then, by sloping the ground surface and possibly by providing roof gutters, storm water could be drained into the storage tank and used for lawn watering.

Because requiring such a system on residential lots would increase the cost to the purchaser, economic incentives -- reduced water rates or property tax breaks -- would need to be provided to make the storage systems more attractive to buyers. Other economic advantages to the homeowner would help ameliorate the high initial cost over the long run.

"First," Urban said, "the amount of water purchased from the utility would be considerably reduced because little or no utility-provided water would be needed for landscape purposes. The amount of this benefit would depend on the rate structure of the utility and the type of landscape desired by the homeowner.

"In some regions, a second benefit would occur because of the improved quality of the water for use on plants," he said.

If this could be implemented on 60 to 70 percent of the lots in each new city subdivision, the city would benefit considerably, if for no other reason than the long-term implications.

"The typical municipality in the American Southwest has exhausted all cheap sources of municipal water supply," Urban said. "Groundwater close to the city has normally been developed. All legally available surface water has been utilized. The next source is probably farther away and can be expected to require more expensive treatment than current supplies."

Usually, the only uncommitted water is either storm water or wastewater, which would require extensive and expensive treatment before it could be used. Further, peak water use in the summer when lawns are watered results in demands often as much as seven times as great as average hourly demand.

"The use of on-site storage, which would reduce both total water demand and peak demand, can delay major capital outlays for the city and reduce the sizing of the water distribution and storm drainage systems, which for the most part, must be designed for peak demand," Urban said.

WRC research by Urban and Dr. B.J. Claborn has shown that implementing such a concept is technically feasible, though some legal modifications may be required to permit water utilities to provide economic incentives. While the economic bottom line looks favorable for municipalities, there is another bottom line -- water availability -- that may be even more critical.

"Storm water is the only supplemental water supply available to many Southwest cities," Urban said. "The sooner they incorporate it into their total water management plan, the better off they will be."

CONTACT: Preston Lewis

9-2-9-87

When the Defense Department began to look toward a Strategic Defense Initiative, one of the first university contracts was awarded to the Texas Tech University Electrical Engineering Department.

The reason is that Texas Tech electrical engineers, in cooperation with several other academic departments, have been studying pulsed power, high power switching and plasma physics for more than a decade.

Understanding and developing high power switching and plasma physics are necessary to create the technology essential to clean nuclear power generation through fusion or, as in the case of the Strategic Defense Initiative Organization (SDIO), a weapons defense system.

Horn Professor Magne Kristiansen of Texas Tech's Electrical Engineering Department is directing a \$3.75 million, 45-month SDIO grant funded through the Defense Nuclear Agency (DNA). The unclassified research -- which also has potential applications in the technology for harnessing nuclear energy through fusion -- involves Texas Tech faculty in electrical engineering/computer science, industrial engineering, mechanical engineering, engineering physics, mathematics and chemistry.

Pulsed power, Kristiansen said, is the art and technology of storing electrical energy over a relatively long time and then releasing this energy in giant, controlled bursts.

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The physics of pulsed power, requiring bursts of electricity in hundreds of thousands of volts and amperes turned on and off within millionths of a second, present special problems not associated with electricity used in smaller amounts and over longer time periods. A better understanding of the process is essential before an anti-ballistic missile system can be perfected.

"Pulsed power is necessary," Kristiansen said, "to get the kind of high power needed for lasers or charged particle beams to destroy a target as big as an incoming missile."

The Texas Tech research is concentrating on three areas: pulsed power materials problems, high power switch technology and new analytical techniques for determining system reliability.

Harnessing pulsed power has been hampered by the wear and tear the high power electrical surges cause on the switching apparatus. The materials research will explore methods of reducing electrode erosion at high currents and of minimizing damage and degradation of insulators, he said.

The switch is the crucial element in what could evolve into a pulsed power system because its design will determine how the rest of the system is designed, Kristiansen said. Research in this area is seeking a reliable, repetitive opening and closing switch which can accommodate great surges of electricity thousands of times a second.

The third area of research is developing ways to test and evaluate procedures for a space-based defense system. Such a defense system must be able to lie dormant for years, yet operate reliably when needed, he said. New testing and maintenance procedures must be developed for the system because conventional methods would be costly and difficult, if not impossible in many instances.

The evaluation and selection of insulators that will survive the harsh environment of space is one of the many research efforts under this program.

Although the research is directed toward military applications, Kristiansen said breakthroughs, particularly in the design of the switching apparatus, could open up a host of potential applications in other areas. One potential application would be for initiating nuclear fusion, a relatively clean and safe nuclear reaction that could produce energy from water.

"One way to initiate fusion is through a big burst of energy," Kristiansen said. "You have to control this input of energy. A switch is essential in shaping the energy pulse that initiates the fusion process."

A fusion reaction releases energy when two positively charge nuclei of hydrogen isotopes are "fused" together. To overcome the nuclei's strong electrical forces of repulsion, large energy requirements are needed to superheat the nuclei and force collisions of the particles.

Precise switches that can go from open to shut in a millionth of a second or less are necessary to provide the timely energy bursts necessary to initiate the fusion process, which gives off massive amounts of energy in the form of heat which can be used by conventional methods to power turbines and generate electricity, he said.

caption-----

10-2-9-87

BEFORE THE WALL--Twenty architectural students at Texas Tech University volunteered more than a thousand man-hours to paint a wall mural in the basement of the Texas Tech Administration Building. The mural highlights the detail of the university's Spanish Renaissance architecture and is based on the original 1924 architectural drawings for the original campus buildings. (TECH PHOTO)

caption-----

11-2-9-87

COLUMN WORK--Texas Tech University housing and interiors senior Patri Spurlen of Eastland and architecture senior Scott C. Spiva of Abilene add a column to a wall mural in the university's Administration Building built in 1924-25. The mural details many of the features of the building's Spanish Renaissance architecture which was incorporated in the early plans and buildings at Texas Tech. (TECH PHOTO)

caption-----

12-2-9-87

STUDENT ARCHITECTS--Texas Tech University architecture design senior Steve Perry, standing, of Sandsprings, Okla., and architecture senior Robert Harris of The Woodlands apply their handiwork to a wall mural in the university's Administration Building. The mural depicts various characteristics of the university's Spanish Renaissance architecture. (TECH PHOTO)

caption-----

13-2-9-87

DETAIL WORK--Trish Thomas, a Texas Tech University architecture senior from Boulder City, Nev., paints details from the university's Spanish Renaissance architecture on a wall in the Texas Tech Administration Building, constructed in 1924-25. The work was part of a mural produced by 20 architectural students in a seminar on the study of architecture as an aspect of culture. (TECH PHOTO)

caption-----

14-2-9-87

ARCHITECTS AT WORK--Patri Spurlen, left, and Scott C. Spiva were among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Spurlen, a housing and interiors senior, is the daughter of Mr. and Mrs. F.L. Spurlen of Eastland. Spiva, the son of Mr. and Mrs. Frank J. Spiva, 2117 Robin, Abilene, is a senior in Texas Tech's College of Architecture. (TECH PHOTO)

caption-----

15-2-9-87

ARCHITECTS AT WORK--Michael Richardson, center, was among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Richardson, a senior architecture major, is the son of Balois and Luz Richardson, 709 Green Wood Drive, Roswell, N.M. (TECH PHOTO)

caption-----

16-2-9-87

ARCHITECT AT WORK--Trish Thomas was among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Thomas, the daughter of Mr. and Mrs. Victor R. Thomas, 1533 Sherri Lane, Boulder City, Nev., is a senior in Texas Tech's College of Architecture. (TECH PHOTO)

caption-----

17-2-9-87

ARCHITECT AT WORK--Ronald Ngiam was among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Ngiam, the son of Mr. and Mrs. Hoo-Pang Ngiam, 6722 Mossridge Drive, Houston, is a senior in Texas Tech's College of Architecture. (TECH PHOTO)

caption-----

18-2-9-87

ARCHITECTS AT WORK--Robert M. Parker was among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Parker is the son of Mr. and Mrs. Don R. Parker, 9224 McFall, El Paso. He is a senior in Texas Tech's College of Architecture. (TECH PHOTO)

caption-----

19-2-9-87

ARCHITECTS AT WORK--Dave Smith, below, was among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Smith, the son of Mr. and Mrs. H. Neal Smith, 2309 Merrimac Drive, Plano, is a sophomore architecture major. (TECH PHOTO)

caption-----

20-2-9-87

ARCHITECTS AT WORK--Tommy Jeffcoat, left, and Khanh Tran T. were among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Jeffcoat, the son of Mr. and Mrs. Robert Jeffcoat, 114 W. Woodbury, Garland, is a senior architecture major. Tran, the son of Mrs. Tien T. Lam Tran, 2212 Sixth St., Lubbock, is a fifth year student in Texas Tech's College of Architecture. (TECH PHOTO)

caption-----

21-2-9-87

ARCHITECTS AT WORK--Steve Perry, standing, and Robert Harris were among students at Texas Tech University who volunteered time to paint an unusual mural in a corridor of the university's Administration Building. The mural depicts architectural detail of the institution's Spanish Renaissance architecture. Perry, the son of John and Dixie Perry, 3205 S. Linwood Lane, Sandsprings, Okla., is a senior architecture design major. Harris, a senior architecture major, is the son of Mr. and Mrs. Paul R. Harris, Six Blazing Star Court, Woodlands. (TECH PHOTO)

CONTACT: Sally Logue Post

22-2-9-87

LUBBOCK--Attention to furniture arrangements and upholstery patterns can produce safer and less confusing environments for Alzheimer's disease patients.

Texas Tech University Professors Joann L. Shroyer and Georgina M. Anderson of the Department of Merchandising, Environmental Design and Consumer Economics and J. Thomas Hutton of the Texas Tech University Health Sciences Center Department of Medical and Surgical Neurology have examined how interior designs can be modified to meet the physical and social needs of Alzheimer's patients.

"Individuals suffering from Alzheimer's disease experience memory loss, disorientation, deteriorating ability to perform normal physical activities, a decrease in ability to remember details, impairment in judgment and difficulty in verbal expression," Shroyer said. "The design of home and institutional environments may have an impact on the functioning and well-being of Alzheimer's patients."

Shroyer, Hutton and Anderson have contributed one of nine articles dealing with Alzheimer's disease in the January issue of Texas Medicine. This is only the second time the state medical journal has concentrated on a single topic.

One of the major problems of Alzheimer's disease and other dementing illnesses is that patients forget how to perform routine tasks and may become unable to identify common objects. Shroyer said they may become confused by complex patterns and designs and develop increased sensitivity to glare, sharp color contrasts and changing light conditions.

Because of these visual limitations, Shroyer suggests that large patterns or solid colors in upholstery and textiles be used for maximum visibility.

"Small designs such as geometric patterns can produce blurred vision and eye fatigue," she said. "The use of larger patterns allows an Alzheimer's victim to see objects more clearly and reduces the probability that he or she will bump into or fall over furniture."

To encourage social integration, interior designs should be selected and arranged to assist the patient in ease of movement from one area to another. Shroyer said paths between furniture groups should be easily maneuverable and clear of obstacles such as low hassocks, footstools or tables.

Sofas and chairs should have wooden or metal arms large enough to permit easy gripping while sitting or rising. The wooden or metal arms also allows the individual to identify the arm of the sofa or chair by touch. The center section of long sofas are often wasted spaces because the patient cannot reach the sofa's arms, she said.

As the aging population of the U.S. increases, the number of people with Alzheimer's and other dementing illness will increase. Shroyer and her coauthors said more emphasis must be directed at the specific needs of this growing group.

"Although human beings have a great propensity to adapt to less than ideal conditions," Shroyer said. "The aged, particularly those with Alzheimer's disease, may have more difficulty."

CONTACT: Beverly Taylor

23-2-9-87

LUBBOCK--A Texas Tech University art professor will go through the steps of an art criticism on an El Greco painting at 11 a.m. Tuesday (Feb. 17) at The Museum of Texas Tech.

Gene A. Mittler will lead attendees through a criticism of El Greco's "The Burial of Count Orgaz" at the weekly art seminar sponsored by the Women's Council of the West Texas Museum Association (WTMA).

Registration and coffee begin at 10:30 a.m. Admission is \$3.

"First we'll describe the painting in terms of subject matter and analyze the elements and principles of design El Greco used to try to lead the eye through the composition," Dr. Mittler said. "Next, we will interpret the idea or mood he was trying to create. The final stage of art criticism is judgment in which we make a personal decision about whether it is a good piece of art."

Mittler will also discuss the art history of the painting which is located in the Church Santo Tome in Toledo, Spain.

"We will look at how the painting has been interpreted and judged historically and the factors that have been given importance," he said. "Because of art history, we either alter or confirm our personal judgments about a piece of art."

The lecture is a part of "Art through the Ages," the 26th year of art seminars held by the Women's Council. This spring the seminar is a study of the Renaissance in Spain and England.

For more information, contact WTMA at (806) 742-2443.

CONTACT: K. Hopper

24-2-9-87

LUBBOCK--Persons interested in the art and history of Spain and Catalonia can explore cultural sites through a summer program in Sitges, Spain, offered through the Texas Tech University Department of Art.

The tour is scheduled for June 9-29 and is offered to teachers, art students or anyone interested in art. Three hours of graduate credit may be earned. Classes will be taught in English and will feature lectures in Sitges and several day-long study tours to artistic, cultural and historical sites.

Tour sites include Barcelona, Tarragona, the medieval monasteries of Poblet and Santes Creus, the historic mountain-top monastery of Montserrat, the Roman ruins at Artafulla, and the ancient village of Mont Blanc.

The course will be taught by Dr. Gene A. Mittler and Dr. Kim C. Smith of the Texas Tech Art Department. Lectures on the history and culture of Spain and Catalonia will be presented by Dr. Josep Roca-Pons, professor emeritus, Indiana University and an international authority on Catalonia.

Participants will learn how to look at works of art and what to look for in those works and will study actual works of art found in museums, monasteries, churches and cathedrals.

A background in art or Spanish is not a prerequisite for enrollment. The deadline for enrollment is mid-April.

For more information and application forms, contact Mittler, Department of Art, Box 4720, Texas Tech University, Lubbock, 79409, or telephone (806) 742-2981.

CONTACT: K. Hopper

25-2-9-87

LUBBOCK--The infrared images of photographer Dierdre Monk will be displayed until Feb. 20 in the S.R.O. Gallery in the subbasement hallway of the Texas Tech University Art Building.

The 18 pieces reflect imagery dealing with the photograph as a personal symbol and as poetic vision.

"My photographs are about the momentary glimpses of daily life that make up our visual perception. I believe that we know things because of contradiction. That is, white is known because of black and soft because of hard," Monk said.

Landscapes are a common subject of Monk's photographs.

Monk, who is assistant professor of photography at Bowling Green State University in Bowling Green, Ohio, photographed the Rajneeshpuram in Oregon during the summer and fall of 1984.

Her work has appeared in various national and local publications, exhibition reviews and commercial work. Her works have been on the cover of Screenprinting Magazine in 1985, in "New American Nudes" published in 1981 and in "The Best of College Photography" in 1981.

Monk's photographs are owned by various collections including the Cincinnati Art Museum, the Library of Congress, the International Center for Photography, the St. Louis Art Museum, the Illinois State Museum and the University of New Mexico Art Gallery.

CONTACT: Beverly Taylor

26-2-9-87

LUBBOCK--A Texas Tech University Health Sciences Center heart surgeon will give a Valentine's Day address about his research at 10 a.m. Saturday (Feb. 14) in the Texas Tech University Chemistry Building, Room 5.

Dr. Mario Feola will discuss blood substitutes at the lecture which is a part of the Saturday Seminar Series sponsored by Texas Tech's Department of Chemistry and Biochemistry.

The Saturday Seminar Series is designed for area high school students and their teachers, but the public may attend. The lecture is free.

The seminar will last until noon. Refreshments will be included.

For more information, contact Professor Russell D. Larsen at (806) 742-3057.

CONTACT: Sally Logue Post

27-2-2-87

Onion plants growing in a greenhouse may not seem unusual, unless the plants came from the test tube rather than seeds.

Texas Tech University plant geneticist Ellen B. Peffley's laboratory has succeeded in producing shoots and roots from onion plant tissue that combines genes from the Japanese bunching onion and the U.S. bulb onion.

Dr. Peffley's new plants hopefully will contain the genes of the Japanese bunching onion that will make the U.S. bulb onion more disease and pest resistant and cold tolerant.

The plants developed from explants, small pieces of tissue placed on special medium in petri dishes. The medium encourages the growth of calluses which, much like cancer cells, multiply and divide but aren't a normal part of the plant, Peffley said. The next step is to treat the calluses with mutagens to increase the occurrence of the mutants that are being produced by the cultured cells.

"In a normal tissue culture situation, abnormal developments are going to occur," Peffley said. "We want to enhance those abnormal developments to achieve unique individuals that are superior to those plants we started with."

The U.S. bulb onion, or *Allium cepa*, is extremely susceptible to disease, pests and extremes in cold temperatures, she said. The Japanese bunching onion, or *Allium fistulosum*, possesses genes that are resistant to those problems. The combining of the best of both plants could mean an increase in profits for onion growers.

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✓ "Onions are very important not only to American tastebuds, but ^{also} to the Texas farm economy," Peffley said. "In 1984, the Texas crop alone was worth \$88 million, making it the state's largest horticultural crop. Texas produces about 17,000 acres of spring onions in the Rio Grande Valley and about 7,000 acres of summer onions in West Texas. That consistently ranks Texas in the top three spring onion producing states in the country."

Peffley said the Japanese bunching onion cannot be substituted for the U.S. onion because it is small bulbed and has an extremely pungent flavor and stringy texture that makes it undesirable for the American consumer's taste.

The bunching onion is naturally resistant to pink root, a prime disease affecting bulb onions. Pink root infects and kills the onion roots resulting in a much smaller than normal bulb which results in less profit for the farmer.

Peffley said the bunching onion is also resistant to thrips, a small flying insect that sucks the juice out of bulb onion leaves causing serious damage to the crop.

The bunching onion is also cold resistant which could help increase crop sizes and profits, she said.

"The normal growing season for spring onions in Lubbock is from October to June," Peffley said. "The most inexpensive way to grow onions is to direct seed them in the fall, but the cold winters in West Texas are extremely hard on the small seedling bulb onions. The other option is to transplant small plants in about February. But that costs about \$300 per acre, not counting other production costs, and the transplants often are weak and not very healthy."

By transferring the cold-hardy genes from the bunching onion to the bulb onion, cold climate producers can direct seed in the fall which is less expensive and produces a better crop, she said.

The traditional means of transferring genes is to cross the cepa onion with the bunching onion to produce a hybrid. But, since the hybrid that results is sterile, conventional methods would call for continuing to cross the hybrid onion back to the cepa until a hybrid is recovered that is fertile and has the desired characteristics. The problem with this method is that it could take a number of years to accomplish.

An alternative method Peffley has chosen to use involves reproducing both onions in the laboratory from tissue samples so the DNA chain (chromosomes) can be studied.

"In the laboratory, we can induce what is called somaclonal variation and regenerate unique individuals with genetic alterations like restored fertility," she said. "We can also tell from these samples where certain changes have occurred on the DNA code so we may be able to tell exactly what we're getting from which plant in the future."

Now that Peffley has plants growing in the soil, she will be able to compare the characteristics that are actually present with what has been observed on the chromosomes in the laboratory so that the process that provided the desirable traits can be repeated. While this laboratory to field process is lengthy, Peffley said once the methods are perfected, the transferring of genes will be much faster.

"The things we are doing in the laboratory by no means replace traditional cross-breeding," Peffley said. "We are just giving plant breeders an alternative and new, faster tool."

CONTACT: Preston Lewis

28-2-10-87

Texas Tech University electrical engineering Professors John F. Walkup and Thomas F. Krile are among a small but growing number of researchers nationally studying optical or "light" computing.

Instead of using electricity to carry data, optical computing uses light. Theoretically, optical computers have the potential to do a quadrillion -- that's a one followed by 15 zeroes -- operations per second. The fastest electronic computers, by comparison, can handle around 500 million operations a second.

Walkup said most existing electronic computers must process information serially, each bit of information going through the circuits single file, so to speak. By contrast, optical computers could process information in parallel, that is numerous lines of data at once.

"Just like one part of my brain can keep my body running while another part controls my conversation," Walkup said, "an optical computer could conduct numerous operations at once."

Though computers can solve in seconds the complicated problems that would take mathematicians lifetimes to finish by hand, they have also pushed back the mathematical and computational frontier to the point that even faster computers are necessary.

Optical computing is an extension of the technology that has resulted in a fiber optics now used extensively in telecommunications. The use of optics in computing offers advantages other than just speed.

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"Though electronic computers have gotten smaller with advances in microchips," Krile said, "you still must interconnect or 'hard-wire' everything. Most of the space in microcomputers is occupied by the interconnections.

"With an optical computer we don't have to hard-wire out paths," he said. "We can incorporate holograms in the computer to direct the light along the proper path through free space. In effect, we can 're-wire' the computer almost instantaneously."

Another advantage is that information in optical computing is carried by photons, the particles composing light and other forms of electromagnetic radiation. Electronic computing uses electrons, particles with a unit charge of negative electricity, to transmit information.

Photons, unlike electrons, are not interrupted by static electricity or nearby lightning and are not affected by radiation. Further, the interference is significantly less for photons traveling through an optic fiber than for electrons moving through an electrical conductor, Walkup said.

Current optical computers are mainly analog computers. Analog computers use one unit or measure to represent another. For instance, the brightness of a light source can represent a number.

By contrast, digital computers use currents of electrons to represent numbers through a binary system -- a Morse code, so to speak. The binary code represents all numbers by combinations of the numerals "0" and "1" or, in terms of the current, "on" and "off" signals, Walkup said.

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Though the analog optical computing process is not as precise as digital computing, it is faster. Walkup and Krile are developing a method for optically multiplying binary numbers.

"Ultimately what we are looking for," Walkup said, "is a way of getting the accuracy of digital processes and the speed of optical computing. But right now with optical computing, we are probably where we were with electronic digital computers back in the late '40s and early '50s."

Walkup said high speed, highly accurate computers will be needed, for instance, to meet the ultra high speed computing requirements in an anti-ballistic missile defense system as has been proposed in President Reagan's Strategic Defense Initiative. In fact, Walkup, Krile, their students and Professor Ichiro Suzuki of the Texas Tech Computer Science faculty have recently begun research on accuracy limitations in optical computing supported by an SDI-funded contract administered by the Office of Naval Research.

Work being jointly done at Tech and at the University of Washington in Seattle is aimed at improving the accuracies of all types of optical computers. Several conference and journal papers have already come out of this joint effort. The effort at the University of Washington is led by Professor Robert J. Marks II, a Texas Tech doctoral graduate who was previously a student of both Drs. Walkup and Krile.

"As we assign computers increasingly complex tasks in defense and other areas," Walkup said, "optical computing holds great promise for helping keep up with our computational needs."

29-2-10-87

KTXTC
Chandler/Inman

CONTACT: Preston Lewis

Channel 5 is a public television station that has exceeded its limitations.

Starting back in October of 1962, KTXT-TV began broadcast operations with limited personnel, limited equipment and limited air time.

Since then those limitations have been surpassed almost on an annual basis and today Channel 5 continues to give the South Plains virtually unlimited educational and cultural opportunities, opportunities that would not be economically possible for most viewers.

KTXT-TV, which is operated through the Division of Continuing Education at Texas Tech University, has been affiliated with the Public Broadcasting Service (PBS) since 1971, vastly expanding the cultural, scientific, business, public affairs and children's programming available to the South Plains.

Channel 5 began with donated black-and-white equipment from area commercial television stations, a limited broadcast radius, air time limited to some eight hours a day and a lot of volunteer help.

Today, KTXT-TV has replaced that original black-and-white equipment with full-color facilities having remote control capabilities.

Network programming is now received by satellite technology. And, for the last five years, Channel 5 has been broadcasting from a 817-foot antenna/tower, *and for the last five months with a new transmitter 600 miles which took the* giving it a broadcast radius area of *22.*

And, broadcast time has doubled to some 16 hours a day.

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*might of record pulling in new hours
hit
ready now*

In addition to expanding its schedule over the years, Channel 5 has also expanded and diversified its services in response not only to its educational charge at Texas Tech but also to its public commitment to provide a wide range of programming for the South Plains.

During the past decade, Channel 5 operating budgets have grown from \$105,000 to \$661,000 with two-thirds of the funding coming from KTXT-TV operating grants and from public contributions.

This year Channel 5 will seek \$125,000 in public donations during its Festival '87 on-air fund-raising campaign March 7-22. KTXT is seeking to sign up 1,000 new supporters, or members, reports KTXT-TV Development Director Karen Payne.

Public contributions to the station have grown from approximately \$8,000 in 1975, the first year the station began its on-air fund-raiser, to about \$175,000 in recent years.

The station now serves about 344,000 South Plains viewers with about 110 hours of programming per week. *multiple alt give optn of 344,000 viewers*
KTXT-TV Those viewers are not just casual viewers, but committed proponents of public broadcasting.

Take, for instance, W.R. Collier, president of American State Bank, one of Channel 5's pioneering corporate sponsors.

"At American State Bank we try to foster and nurture things that are good for this area of West Texas," Collier said. "We believe that public television contributes a great deal to the quality of life on the South Plains. Channel 5 provides a fresh alternative."

Some of the most avid supporters of Channel 5 are the very young and the very old. Though their financial support is, by circumstance, often small, their sincerity is genuine, Payne said.

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Annually, KTXT receives dozens of 'love letters' from children expressing their affection for Big Bird and other Sesame Street characters or for Captain Kangaroo and Mr. Rogers.

Senior citizens, many of whom may be homebound, have serious health problems or live on limited income, are some of the most faithful supporters, not only with their viewership, but also with their limited funds, Payne said.

Wrote one nursing home resident, "Cheers! Bravo! And, thank you! What a wonderful schedule of programs you have. Truly, you give Lubbock and its environs the most enriching programs one can imagine. I love them all."

Said another senior citizen, "You are providing an important service. Channel 5 is virtually our only source of entertainment. We simply cannot tolerate the violence, mindlessness and other unpleasant aspects of many commercial TV programs."

What public television comes down to is an alternative, Payne said, giving people of all ages programs geared to their own levels and needs.

"Public television continues to grow, despite its financial limitations because it is providing a service no one else can," Payne said.

Tax-deductible memberships start at \$25 for individuals and \$40 for families, but many individuals, businesses and corporate sponsors contribute at higher levels.

*For more information contact P.V. - 2
with Don C. at 742-2209.*

Texas Tech News

AFTER HOURS CALL:

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Preston Lewis, Manager, News Bureau, (806) 745-1718

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TEXAS TECH UNIVERSITY/TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER
NEWS AND PUBLICATIONS/P.O. BOX 4640/LUBBOCK, TEXAS 79409/(806) 742-2136

CONTACT: Sally Logue Post

30-2-10-87

LUBBOCK--The harder you try to sleep, the harder it is to fall asleep.

While most people experience difficulty falling asleep due to some outside stress, Chairperson Gustavo C. Roman of the Texas Tech University Health Sciences Center (TTUHSC) Department of Medical and Surgical Neurology, said those temporary problems are not insomnia.

"Most sleep problems are reflections of normal daily life," Dr. Roman said. "Insomnia is only considered to be present when a person cannot go to sleep for three to four hours after turning the lights out every night for a month," Roman said.

Roman said many people find that when they have trouble falling asleep, a glass of wine or a cocktail will relax them so they fall asleep faster. But he warns that can be a dangerous cure.

"Eventually, greater quantities of alcohol are needed to be able to sleep," Roman said. "When that happens, the sleep pattern is broken. The person does not move into REM (rapid eye movement) sleep, which is the deepest sleep stage where dreaming occurs. As a result, the person is less rested in the morning. It can become a vicious cycle."

Insomnia is one of the many disorders Roman and his colleagues see at the TTUHSC Center for Sleep Disorders. Roman, who is director for the center, said about 50 million men, women and children in the U.S. suffer from some form of sleep disorder. The center, the first in West Texas, was developed to diagnosis and treat the frustrating and sometimes fatal sleep disorders.

One of the most common problems seen at the Center for Sleep Disorders is sleep apnea, a disorder that in its extreme can be life threatening.

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"Sleep apnea occurs when the breathing passages become blocked causing a stoppage of breathing for from 10 to 90 seconds," Roman said. "These apneas can occur hundreds of times a night. When breathing stops, the concentration of oxygen in the blood drops forcing blood pressure up. This can cause unusual heart rhythms and even sudden death."

Snoring is the major symptom of sleep apnea, Roman said. Often, instead of being aware there is a breathing-pattern problem in a partner, spouses have been driven to sleeping elsewhere by the heavy snoring and may not be aware there is actually a stoppage of breathing.

Besides the physical problems, Roman said sleep apnea, which most often strikes men over age 45, affects the sleep pattern causing people to spend more sleep time in the less restful early cycles of sleep.

"Apnea victims spend their nights in the first two stages of sleep," Roman said. "They do not progress into delta sleep (the third and fourth stages) or finally into the REM stage which is the most restful stage of sleep."

Roman said many children suffer from sleep disorders known as night terrors. These night terrors are not normal nightmares because they happen during Delta sleep when dreams, including nightmares, do not occur.

"With night terrors, children wake up in a panic," he said. "They are usually a reflection of environmental stress caused by a parental divorce or other traumatic change in the child's life."

Sleep walking is another major sleep disorder that Roman warns can be dangerous.

"The theory that a sleep walker won't get hurt is wrong and dangerous," Roman said. "A sleep walker can get into serious trouble if there are stairs or plate glass doors around."

Roman also said a change in a work shift or changing time zones can cause sleep problems.

"Anytime one changes his sleeping patterns from day to night or faces a major shift in time zones, sleep problems are a possibility," Roman said. "It can take one week or more for people to get their inner clocks adjusted to a different job cycle or to different time zone. There is evidence that a number of accidents can be blamed on jet lag or job shift changes because when there must be a change in sleep cycles, the body may not be fully awake when it needs to be."

Roman said many sleep problems are reflections of the stresses that occur in daily life. In cases where the stress cannot be easily removed, people should concentrate on building good sleep habits.

"Because the harder one tries to go to sleep the harder it is to get to sleep, people should develop a sleep routine that will help them set their inner clock for bed time," he said. "Drinking a glass of warm milk really is helpful. It contains the amino acid tryppophan that is one of the body's messengers that tells the brain to go to sleep."

Roman said appointments at the Center for Sleep Disorders can be made through a family physician or through the Sleep Hotline at (806) 743-2020. Patients at the sleep clinic are carefully interviewed about past medical history. They often spend one to two nights at in the home-like private rooms of the center for polysomnograms, or sleep recordings. The tests and medical history will be reviewed by the appropriate expert from a team of specialists including neurologists, cardiologists, pulmonologists, psychiatrists, neuropsychiatrists, urologists, gastroenterologists, ear-nose-throat specialists, oral surgeons and experts in the physiology of sleep.

Texas Tech News

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CONTACT: Beverly Taylor

31-2-10-87

LUBBOCK--Twenty-five places are available on a "Grand Tour of Europe" through the Texas Tech University College of Education (COE).

COE Dean Richard E. Ishler will lead the study tour June 28 through July 15. The tour can be taken for three hours of undergraduate or graduate credit in the COE and most public school districts will accept it for career ladder credit. Individuals not involved in education may also take the tour.

The tour will include sightseeing in London, Paris, Switzerland, Italy, Venice and Rome along with seminars about European education.

"This trip is a perfect opportunity to compare European schools and education with that of the U.S.," Dr. Ishler said. "At the same time, there are plenty of opportunities for tourist activities."

The education component of the trip will include seminars and professional visits June 30 through July 3 while the group is in London. The seminars will be presented by British teachers and other educators. Those taking the tour for credit must write a paper about how they will incorporate the British open classroom concept into their own classrooms or about how European and American education compare.

Those not on the tour for credit may extend their sightseeing.

Teachers and administrators may take the course for credit in elementary education, secondary education or special education. Each will include information about education in the 1990s, European education and visits to appropriate schools.

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Other elementary-level sessions will be on cognitive development and language arts in England. The secondary-level sessions will include presentations about organization and discipline in British schools. The special education component will be an overview of British special education.

Guided sightseeing and optional excursions June 30 through July 4 in London will include visits to St. Paul's Cathedral, the Tower of London, Big Ben, Westminster Abbey and other historic sites. July 5-7 will be spent in Paris where the group can tour the city, see the Gothic Cathedral of Notre Dame, ride to the top of the Eiffel Tower and take a cruise down the River Seine.

July 8-9 will be spent in Lucerne, Switzerland and the Swiss Alps. Venice, Florence and Rome in Italy will round out the tour through July 14.

Some individuals may choose to extend their trip to take a Greek Islands cruise option from July 15 through July 20. Stops in Athens, Mykonos, Turkey, Rhodes, Crete and Santorini are scheduled.

Cost for the Grand Tour of Europe is \$1,590 per person and the Greek Islands cruise is an additional \$450. Airfare is not included.

"These prices are excellent for the value of the trip," Ishler said. "They are the same prices we charged for this trip in 1982."

Registration and a non-refundable \$250 deposit are due by May 15. The remainder of the payments are due by June 10.

For more information and to obtain registration materials, contact Ishler at the College of Education, Texas Tech University, Box 4560, Lubbock, Texas 79409 or call him during office hours at (806) 742-2385 or at home at (806) 794-4961.

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CONTACT: Preston Lewis

32-2-10-87

LUBBOCK--MacArthur Fellow and Professor Frank J. Sulloway of Harvard University will deliver two public addresses on Sigmund Freud and on Charles Darwin Feb. 16-17 at Texas Tech University.

Dr. Sulloway, a science historian and a lecturer in the Department of Psychology and Social Relations at Harvard, will speak on "Censorship the Freudian Way" Feb. 16 and on "Darwin and the Galapagos" Feb. 17. Both free lectures will begin at 7:30 p.m. in the Special Collections Room on the third floor of the Texas Tech University Library.

Sulloway in 1980 received the Pfizer Award from the History of Science Society for his book "Freud, Biologist of the Mind." Sulloway, author of several papers on the foundations of Darwin's theory of evolution, is now working on a biography of Charles Darwin.

Also in progress by Sulloway is a work on birth order and scientific revolution. The study uses different factors such as religion, socio-economic status, education and, most importantly, birth order to explain how and why scientists respond to revolutionary theories.

His visit to Texas Tech is being funded by the History of Science Society which promotes historical studies of science at the nation's institutions of higher learning. Campus sponsors of the lectures are the College of Arts and Sciences, Graduate School, University Libraries, Friends of the Library, Honors Program, and the departments of History, Biology and Psychology at the university and the Department of Psychiatry at the Texas Tech University Health Sciences Center.

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Sulloway's works have been described by many critics as important for the new perspectives they provide on the work of the major figures who helped shape modern scientific understanding. His works also offer insights into the factors that affect intellectual creativity, scientific revolutions and the mythology that portrays men like Darwin and Freud as solitary figures whose individual genius alone led to profound intellectual breakthroughs.

During the lectures, an exhibit of rare books on the history of science will be displayed in the library.

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CONTACT: Preston Lewis

33-2-10-87

LUBBOCK--The president-elect of the Institute of Electrical and Electronics Engineers will deliver the second address Tuesday (Feb. 17) in the Halliburton Distinguished Lecture Series this semester in the Texas Tech University College of Engineering.

Russell C. Drew, who is also the president of Viking Instruments Corp., will speak on the "Foundation of U.S. Technology Policy" at 4:30 p.m. Feb. 17 in the Lankford Lab of the Electrical Engineering Annex. The program is free to the public.

Drew's company is involved in the development of analytical instruments. He is a past president of Science and Technology Consultants and former director of Washington, D.C., operations of Systems Control Inc.

Dr. Drew has been a senior staff member for the science adviser to the President of the United States. He also directed the Office of Naval Research in London and worked on development of the Polaris Missile System.

Other speakers in the spring lecture series will be Lawrence C. Kravitz, vice president and director of technology for the Bendix Aerospace Sector of Allied Signal Inc., March 24, and Allen J. Wright, manager of automation applications for Intelledex Inc., April 21.

The Halliburton Distinguished Lecture Series is sponsored annually by the Halliburton Foundation in conjunction with the Texas Tech College of Engineering.

CONTACT: Sally Logue Post

34-2-11-87

Decreasing the cost of beef cattle production, increasing profits and making red meat cheaper and more wholesome for the consumer is the aim of research at Texas Tech University's Burnett Center for Beef Cattle Research and Instruction.

The center, located at Texas Tech's experimental farm in northwest Lubbock County, combines state-of-the-art feedmill and feedlot facilities for research and student instruction. Thornton Professor Rodney L. Preston of animal science said the Burnett Center allows Texas Tech scientists to follow the process of feeding cattle from mixing the feed to the quality of the beef produced.

"The center also gives us the most modern facility in the nation to train graduate students in how to do beef cattle research and teach undergraduate students basic courses," Preston said. "The center is also used for continuing education courses and is open for inspection by the public so they can ask questions and take away whatever ideas they can to improve their own feedmills or feedlots."

The feedmill is completely computerized which reduces human error in both the mixing and distributing feed, Preston said. "The feedlot is designed in a series of small pens that hold the optimum number of cattle needed for scientifically correct experiments."

Preston points to a recent project that has twice proven that using a more expensive protein source will ultimately result in a lower cost per pound of gain on incoming feeder cattle.

"We used a combination of blood meal and corn gluten meal as a protein supplement and while it costs about three times as much as traditional protein sources, we found a 20-35 percent reduction in cost per pound of gain in two separate trials," Preston said.

Preston, graduate student Tom Eck, research associate Steve Bartle, and former Texas Tech Professor Bob Brandt conducted the research. Preston said it has been theorized that if a protein supplement could be found that would not be fermented in the rumen, or first stomach of a steer, increased weight gains and feed efficiency would result.

"This is one of the first times the value of rumen escape proteins has been shown in incoming feedlot cattle," Preston said.

Preston said there are theoretically two advantages to rumen escape proteins. First, more total protein reaches the lower tract to be absorbed and used by the animal. Secondly, amino acids that are deficient in microbial protein are available to better meet the animal's requirements.

Preston said the problem with the traditional protein supplements of urea and cottonseed meal is that an inadequate amount of protein reaches the lower tract where it is digested and absorbed.

Blood meal, a byproduct of packing plants, only undergoes about 20 percent protein breakdown in the rumen, leaving 80 percent to pass to the lower tract. Corn gluten meal, a byproduct of the process that removes corn starch from corn grain, undergoes about 35 percent protein breakdown in the rumen, leaving 65 percent to escape into the lower tract.

"The more protein that reaches the lower tract, the quicker cattle gain, and the sooner they can be moved out of the feedlot which reduces the cost to the producer," Preston said.

Preston said other research projects include work on a new ionophore, which is a compound that promotes the movement of certain ions through membranes.

"These ionophores alter the fermentation in the rumen which improves feed usage by the cattle," Preston said. "We are doing some of the first trial work on this new ionophore at the Burnett Center and initial results look like it will be as good as or better than those currently on the market."

Preston and graduate student Deana Hancock are beginning work at the center to try to prove or disprove the theory that anabolic agents in cattle work through growth hormone, causing faster muscle growth.

"After 30 years of using anabolic agents, we still don't know exactly how they work," Preston said. "We hope to either prove the theory that they stimulate growth hormones or find a different explanation of how they work. This information is needed to help assure the safety of beef produced using these agents."

Preston pointed to the involvement of graduate students in the research on rumen escape protein and anabolic factors as examples of how the Burnett Center is used to train future animal scientists as well as feedlot and feedmill managers.

"Because we have state-of-the-art technology, our students should be some of the best trained and best equipped professionals when they receive their degrees," Preston said.

CONTACT: Sally Logue Post

35-2-11-87

A natural film of varnish can help scientists determine the ages of previously undated archeological artifacts and landforms and how ancient environments changed.

Texas Tech University geography Professor Ronald I. Dorn, along with other scientists, is working with rock varnish, a dark-colored, paper-thin coating of clay minerals, manganese, iron oxides and trace elements that covers anything left exposed to the atmosphere in arid and semi-arid climates.

"The microorganisms that sit on a rock or cultural artifact concentrate manganese and iron and form a kind of mortar that cements clay minerals that fall from the atmosphere to the artifact's surface, forming a layer of varnish," Dorn said.

Dorn's techniques have uncovered new evidence that suggests that humans may have lived in eastern California during the last ice age, thousands of years before the commonly accepted time of their arrival about 12,000 years ago.

"Many people have thought the California Mojave desert was uninhabited during a warmer, dryer time about 7,000 to 4,000 years ago," Dorn said. "But our varnish dating shows that people lived and worked in the desert fairly continuously from perhaps more than 16,000 years ago to the present."

Dorn's work earned him one of 200 Presidential Young Investigator awards for 1987. He is only the second geographer to receive the prestigious award from the White House and the National Science Foundation.

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Dorn, and his collaborators, have developed five rock varnish techniques in their attempt to effectively map the geographic distribution of environmental changes over time.

Dorn's first technique involves comparing the age and the ratio of positive ions locked in the varnish to date archaeological objects and landforms. The second technique uses radiocarbon dating on organic matter that Dorn has been able to extract from the lowest levels of the rock varnish. The third method uses stable carbon isotope ratios of organic matter in the varnish to indicate the abundance of present and past plant species. Dorn has also discovered that the structure of the varnish reflects the dustiness of past environments. Finally, Dorn has found that relative concentrations of manganese versus iron fossil layers indicate past levels of alkalinity in the adjacent environment.

Dorn also hopes to use the varnish in the future as an indicator of temperatures in ancient environments and as a tool in geochemical exploration.

"While these indicators are only a small part of a complete reconstruction of ancient environments, the key to comprehending past changes in those environments is obtaining records that are widely available and datable," Dorn said. "My research has concentrated in the development of new techniques and their application toward the reconstruction of changes in past environments."

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38-2-11-87

STATE-OF-THE-ART--The \$4.3 million Texas Tech University Burnett Center for Beef Cattle Research and Instruction is the most sophisticated feedmill-feedlot complex in the country. (TECH PHOTO)

caption-----

39-2-11-87

COMPUTER OPERATED--The cattle feeding operation of the Burnett Center for Beef Cattle Research and Instruction feedmill is totally computer operated. Lonnie McDonald, feedmill-feedlot complex manager prepares the morning feed mixes. (TECH PHOTO)

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CONTACT: Sally Logue Post

40-2-11-87

LUBBOCK--Three Texas Tech University professors will be recognized for their teaching, research and leadership by the Dads and Moms Association Saturday (Feb. 14).

Shelby D. Hunt of marketing will receive the Barnie E. Rushing Faculty Distinguished Research Award; Margaret "Peg" Wilson of health, physical education and recreation will receive the Faculty Distinguished Leadership Award; and Ronald Rainger of history will receive the Hemphill-Wells New Professor-Excellence in Teaching Award.

The professors will be recognized at the Dads and Moms Association Mid-Winter Trustees meeting luncheon at 11:50 a.m. Saturday in the University Center Coronado Room.

Hunt, a professor of marketing at Texas Tech since 1980, is also a Paul Whitfield Horn Professor, the highest honor the Board of Regents can bestow on a professor. In 1986, he received the American Marketing Association's Paul D. Converse Award for outstanding contributions to theory and science in marketing.

Hunt earned his bachelor's degree from Ohio University and a doctorate from Michigan State University.

In nominating Hunt, College of Business Administration Dean Carl H. Stem noted that Hunt was named the most influential and widely respected living marketing theorist in the United States in a recent survey of marketing faculty at doctoral-producing universities.

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Marketing Area Coordinator James B. Wilcox, said of Hunt in his nominating letter, "While many faculty 'publish,' the measure of a true scholar is the impact they have on their discipline and the contribution they make to it. Professor Hunt receives full marks as a scholar."

Wilson, a Texas Tech faculty member since 1965, has served two terms as Faculty Senate president. In his nominating letter, Otto M. Nelson, associate dean in the College of Arts and Sciences, said, "having served as Senate vice president during Peg's first presidency, I can attest to the concern, dedication, thoroughness, and sense of fair play that Peg displayed during her term of office."

History professor Jacqueline Collins, in a supporting letter also mentioned Wilson's Faculty Senate leadership. "She played an important role in the writing and adopting of a new tenure policy. It seems hard to imagine things working out so well if she had not been there. All of us -- the whole university community, but principally the faculty -- owe her a great deal."

Since 1964, Wilson has served the university and professional organizations as a member, sponsor or chair of 120 committees and groups. Currently Wilson's committee assignments include the Convocations Committee, Arts and Sciences Tenure and Promotion Committee and, Faculty Senate Academic Programs Committee. She is also editor of the departmental newsletter and sponsor of Delta Psi Kappa.

Rainger is in his third year in the Texas Tech History Department. He received his bachelors degree from Willamette University in Salem, Ore., a master's from the University of Utah and master's and doctoral degrees from Indiana University.

He received the 1986 Outstanding Guest Lecturer award from the Honors Program and was named 1986 Outstanding Undergraduate Teacher in the College of Arts and Sciences.

In a nominating letter James W. Harper, director of the Honors Program, said, "He is an adept lecturer who reveals a mastery of his complex material, striking clarity and infectious enthusiasm for his subject."

Comments from students on course evaluations also recommend Rainger's teaching abilities. One student wrote, "Dr. Rainger is the best professor that I've had while I've been here at Tech. I really don't enjoy history very much, but he made me want to come to class. He was very fair and encouraged class discussion. He knew everyone's name in class and I have already recommended him to several other students who have to take history."

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CONTACT: Beverly Taylor

41-2-11-87

LUBBOCK--Almost everyone can find a physical activity that will provide the benefits of a chronic exercise program and make them feel better.

Claire Kispert, a physical therapy professor in the Texas Tech University Health Sciences Center School of Allied Health, said the key is finding the right form of exercise.

"For some people the right kind of exercise is just walking," said Dr. Kispert. "They have to take into consideration what they like to do and their personal goals for exercising."

She said when individuals find activities they enjoy doing, they have made progress toward overcoming one of the major obstacles to an exercise program -- non-compliance.

"Exercising is a very individual thing," she said. "People have different priorities and different motivations. If you enjoy doing something and you feel the benefits you had hoped for, then your chances of sticking with it are going to be much greater than if you really don't enjoy the activity."

For most adults, the major goal of an exercise program is cardiovascular fitness, she said. Aerobic exercises such as aerobic dance, stationary and outdoor cycling, swimming, walking and running promote fitness by increasing the cardiovascular system's ability to deliver oxygen to active muscles.

The risk of developing coronary artery disease is lowered by a regular aerobic exercise program, Kispert said. The benefit is related to the role of exercise in keeping body weight and blood pressure within normal ranges and in altering blood cholesterol.

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Kispert said that to gain the benefits of exercise individuals need to exercise at around 75-80 percent of their maximal heart rate or their heart rate when they exercise as hard as they can.

"You can only last at your maximal level for three or four minutes," she said. "Many people feel they have to go out and run at their maximal level. You don't have to and, in fact, that can be dangerous. Too strenuous exercise can get you in trouble and exercise that is not strenuous enough won't provide the benefits."

The long-term benefits of aerobic exercise are that the submaximal heart rate decreases and the maximal aerobic capacity increases. The end result is that the cardiovascular system can pump more blood and oxygen while putting less stress on itself, she said.

"Physical therapists can come up with individualized exercise prescriptions which address specific problems and areas of focus," Kispert said. "Some people need to keep in mind medical problems, such as kidney disease or diabetes and others want to exercise to lose weight. The exercise program would be different for each situation."

She said people who know very little about exercise should probably consult a health care professional before starting an exercise program. People over 40 who are just beginning to exercise and those with health problems or a family history of health problems should also take a stress test, such as running on a treadmill, to determine their maximal heart rate and how hard they should exercise.

"Sedentary people who just go out and start exercising can run into some problems," she said. "Everyone should start gradually and that's more important the older you are."

For starters, individuals should exercise 20-30 minutes three times weekly for four to six weeks. If no problems develop, they can increase to 45 minutes four or five times a week and continue to build until they get as much exercise as they want.

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CONTACT: Preston Lewis

42-2-11-87

(MEDIA ADVISORY--You are invited to attend a news conference at 4:30 p.m. Thursday (Feb. 12) for the announcement of a major gift from Texas Instruments to the Texas Tech University and Texas Tech University Health Sciences Center Research Foundation. The news conference will be in the Green Room of the University Center on the Texas Tech campus. Representatives of the foundation, Texas Instruments and Texas Tech will be present. For information, contact Joan Baker, foundation vice-chair, at 762-6411, ext. 2031.)

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CONTACT: Sally Logue Post

43-2-11-87

LUBBOCK--The utilization of fiber by ruminants will be the topic of the third annual Texas Tech University Thornton Distinguished Lecture Series on Plant Utilization by Ruminants.

Dr. E.R. Orskov, senior scientist in the Nutrition Division of the Rowett Research Institute, Aberdeen, Scotland, will speak at 3 p.m. Tuesday (Feb. 17) in Room 101, Goddard Range and Wildlife Building, on the Texas Tech campus. The lecture is open free to the public.

Orskov, who has been with the Rowett Research Institute for more than 20 years, is an expert in ruminant utilization of fiber, starch and protein. He is the author of more than 290 scientific papers and the book "Protein Nutrition in Ruminants."

Ruminants, such as cattle, sheep and goats, get much of the fiber in their diets from plants. They are the only animals able to derive any significant amounts of fiber from plant material. It is the ruminant's ability to gain energy from that source that allows plants to play a major part in the food chain, according to Texas Tech Thornton Distinguished Professor Rodney L. Preston of animal science.

Orskov also will speak on starch utilization in ruminants to the Plains Nutrition Council at 6:30 p.m. Monday (Feb. 16) at Lubbock Plaza Hotel.

For more information, contact Preston at (806) 742-2453.

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CONTACT: K. Hopper

44-2-11-87

LUBBOCK--Four Texas Tech University theater design students have won awards at the Design Texas Exhibit.

The exhibit was a part of the Texas Educational Theater Association (TETA) and the United States Institute of Theater Technology (USITT) convention in Lubbock.

Texas theater designers, students and teachers annually show their work at the TETA and USITT convention.

Douglas Gilpin, a graduate design student, won a cash award for excellence in scenery and lighting. Terry Gipson, a senior theater arts design major, also won a cash award for scenery design. Caroline Crawford, a doctoral student in theater design, won a certificate of excellence in costume design.

Crawford won the regional theater design competition in January at the American College Theater Festival in Fort Worth. Crawford will represent the southwest region at the National ACTF design competition in April in Washington, D.C.

Other Texas Tech theater design students competing at the ACTF competition were Gilpin, Mark Ayers and Crystal Olliff.

Gilpin is the son of Mr. and Mrs. Kenneth Cowen, Route 10, Tyler. Gipson is the son of Mr. and Mrs. James A. Gipson, Route 1, Whitehouse. Crawford is the daughter of Mr. and Mrs. A.S. Crawford, 57 Tradd St., Charleston, S.C. Ayers, a graduate theater arts student, is the son of Mr. and Mrs. L.W. Blackard, Carrizo Springs.

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CONTACT: Beverly Taylor

45-2-13-87

LUBBOCK--Many first graders are managing major corporations and running sensitive chemical experiments -- at least on computers. The ones who aren't are sending their teachers back to school.

Jerry Willis and Lamont Johnson, instructional technology professors in Texas Tech University's College of Education, said public school teachers are going back to college in hordes to learn how to use one of the best educational tools ever invented -- the computer.

Willis and Johnson have both written numerous articles and books about personal and educational computing. Willis wrote "The Peanut Butter and Jelly Guide to Computers," one of the first books on personal computing, and Johnson is editor of "Computers in the Schools," one of four major journals covering computer education.

"Teachers who have been out of school more than five years are probably going to have students who know more than they do about computers," said Dr. Johnson. "They come back to take classes about how to use computers and how to incorporate them into their particular classrooms."

The variation in levels of computer literacy among recent college graduates and those who graduated several years ago exist because of changes in the past three years in the way computer courses are taught, said Dr. Willis.

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"A real transition has taken place in the last four years," said Willis. "The emphasis in the first microcomputer courses to hit the schools was on programming. Now we assume we're teaching someone who is going to be a competent professional in a field other than computer information systems and that they will adapt already developed programs for their own purposes."

Although some public school students today get a taste of computers by the first or second grade, many teachers are still uncomfortable with the technology and do not know its educational power.

"The real power of the computer is its ability to simulate an environment," said Willis. "A student can simulate virtually any situation on the computer, including complex chemical experiments, running a company or growing a garden.

"Most of the skills you need to do the real thing are needed to do it on the computer. First graders can plant seeds, water them and watch them grow and then they can find out if they watered them too much or too little and what they could have done differently to make them grow better."

Johnson said the simulation ability helps overcome one of the major deficits of classroom teaching -- the artificiality of the environment.

"Learning by doing is much more profitable than a teacher lecturing to a class," Johnson said. "The old idea that if kids are having fun, they aren't learning is not true. In the real world, you learn best when you are enjoying it. Computers have a way of getting students more invested in the subject."

Texas is one of the few states to require prospective teachers to take computer courses. The requirement, Willis said, is resulting in diffusion of computer technology throughout the public school curricula.

"Two patterns of usage have developed," he said. "One is the computer room where all the computers are kept and students come in to get familiar with them. Now, we're seeing diffusion of the technology as teachers discover the educational value of computers and begin using the computer in their own classrooms."

Beginning teacher trainees and those who are returning for computer courses at Texas Tech use the College of Education's Educational Computing Lab which is equipped with 25 personal computers or the Advanced Technology Learning Center, a central facility equipped with several microcomputer labs and mainframe equipment.

"Computers will play a big role in education in the future," said Willis. "It's already getting to the point where the teacher who doesn't know the educational power of the computer is at a disadvantage."

Story ideas for the week of
February 16-20, 1987
46-2-12-87

Texas Tech University
University News & Publications
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Radio & Television New Service

EVOLUTION OF A CITY--The factors which made Lubbock a modern city will be examined in a symposium at 7 p.m. Thursday (Feb. 19) in The Museum of Texas Tech University. The symposium, "The Development of Modern Lubbock: Community in West Texas," will examine the influence of education, medicine, religion, sports and cultural life in the city. Sponsors are the History Department, Southwest Collection and West Texas Museum Association. For information, contact Alwyn Barr of the history faculty at 742-3744.

ANSWERS FROM THE LAB--A scientific breakthrough receiving national attention may provide answers to questions that could not even be asked in the recent past. Since 1985, when cotton fibers were first grown under lab conditions, Texas Tech University scientists are discovering the advantages of studying laboratory-grown cotton fibers. Test tube cotton is opening up potential improvements of cotton quality. For more, contact Dr. Jerry Berlin of biological sciences, 742-2704, or Dr. J.R. Goodin, dean of arts and sciences, 742-3835.

OUT-OF-CONTROL COSTS--A stack of \$1,000 bills more than 34 miles high would be needed to pay for the health care Americans receive annually. Texas Tech University economist Lewis Hill says annual health care expenditures have increased about 3,000 percent since 1950, accounting for 11 percent of the gross national product. Hill says the growing use of health care services is a result of the rise in the number of third party payers, including insurance companies and government supported health programs. For more on the future of medical costs, call Hill at 742-2201.

MAKING IT EASIER--Attention to furniture arrangements and upholstery patterns can produce safer and less confusing environments for Alzheimer's disease patients. Texas Tech University Professors Joann L. Shroyer and Georgina M. Anderson of the Department of Merchandising, Environmental Design and Consumer Economics and J. Thomas Hutton of the Texas Tech University Health Sciences Center Department of Medical and Surgical Neurology have examined how interior designs can be modified to meet the physical and social needs of Alzheimer's patients. For more, call Dr. Shroyer at 742-1942.

For assistance with these and other story ideas, contact Dorothy Power/Don Vanlandingham, News & Publications, 742-2136.

CONTACT: Sally Logue Post

47-2-12-87

Since 1979, the Texas Tech University Health Sciences Center School of Medicine has produced more physicians entering direct patient care in West Texas than any state medical school and has helped alleviate statewide physician shortages, said Texas Tech University and Health Sciences Center President Lauro F. Cavazos.

The Health Sciences Center's newest schools, Nursing and Allied Health, are also beginning to produce graduates who are filling vacancies in West Texas health care, but the School of Medicine's longer history best illustrates that impact, Cavazos said.

"In 1970, the year after the school was established, there was one physician for every 1,289 people in West Texas. In 1984, that ratio had been reduced to one physician per 922 residents," Cavazos said.

The rural and medically underserved nature of West Texas is reflected in physician-to-population ratios. In 1980 there was one physician for every 1,080 West Texan as compared to a national ratio of 1 to 609. One-half of the counties designated as medically underserved had either no physicians or had a physician-to-population ratio of one per 5,000.

Data based on 1981 figures shows that 80 percent of the state's population lives in metropolitan areas and is served by 91.3 percent of the physicians, Cavazos said.

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These proportions do not appear to present a serious problem until one considers that of the 254 counties in Texas, 54 contain 91.3 percent of the physicians and 80 percent of the population, according to a Southern Regional Educational Board publication "Supply and Distribution of Physicians in the South." Two hundred counties account for only 8.7 percent of the physicians and 20 percent of the population. These numbers present a clear picture of the state's maldistribution of physicians.

Since the school's first graduating class in 1974, 691 new doctors have earned degrees. Of those, 63 percent have chosen primary-care residency programs for specialization, Cavazos said. That number has increased to 66 percent for those graduating since 1981.

Of those physicians completing primary-care residency programs at TTUHSC, more than half are practicing in Texas with many remaining in the West Texas service area, he said.

Through 1986, 56 physicians have completed residency training in internal medicine. Of those, 68 percent have remained in West Texas. In obstetrics and gynecology 71 percent remain in Texas and 43 percent are practicing in West Texas. In pediatrics, 58 percent of the physicians finishing the four-year speciality program have remained in Texas, 42 percent in West Texas.

Family medicine is TTUHSC's largest residency program with 178 physicians finishing the advanced study through June 1986. Of those, 72 percent are practicing in Texas, 52 percent in West Texas.

"The Health Sciences Center, through 1986, has had 322 physicians finish advanced specialization programs in the four areas of primary care," Cavazos said. "Of those, 72 percent are practicing in Texas and 165, or 52 percent, have remained in our West Texas service area."

Of the non-primary care residency programs offered, TTUHSC has had 130 physicians complete programs in anesthesiology, dermatology, emergency medicine, ophthalmology, orthopaedic surgery, psychiatry and surgery. More than 50 percent of the physicians in these specialties who have remained in Texas are practicing in West Texas.

The lack of nurses is also severe in rural areas of the state. According to 1984 Texas Office of Rural Health figures, there is an estimated one active registered nurse for every 387 persons in rural areas as compared to one for every 194 persons in metropolitan areas.

Of the more than 50,000 licensed vocational nurses in Texas in 1984, only 24 percent were practicing in rural areas, Cavazos said.

Since its first graduating class in 1983, 95 students have completed the School of Nursing's program. Of those, 91 percent are practicing in Texas and 75 percent in West Texas.

The School of Nursing is different from other nursing programs that offer two-year diploma programs, Cavazos said. The School of Nursing offers a four-year program granting the bachelor of nursing degree in which students with previous nursing backgrounds can receive credit for their previous education. Of the 95 graduates, 47 are "new nurses" with no previous nursing background, Cavazos said. Seventeen are licensed vocational nurses and 31 are registered nurses who returned to school to earn bachelor's degrees.

The School of Allied Health is the newest of TTUHSC's three schools. Since its first graduating class in 1985, 41 student have graduated with bachelor's degrees in physical therapy, occupational therapy or medical technology, Cavazos said.

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The Department of Physical Therapy has 64 percent of its graduates practicing in Texas, the Department of Occupational Therapy, 86 percent, and the Department of Medical Technology, 33 percent. Of all the allied health graduates practicing in Texas, one-half are practicing in West Texas, he said.

The lack of physical therapists in the state in general, but specifically in rural areas, demonstrates the need the School of Allied Health is beginning to meet. In 1984, there were approximately 1,781 licensed active physical therapists in Texas, 91 percent of which were practicing in metropolitan areas. Cavazos said that there were 106 counties without any physical therapists, all rural.

Cavazos pointed out that the problems of rural health delivery extend far beyond the maldistribution of health care personnel.

Because the majority of West Texas towns have only a small hospital, if any, many services are not available. By establishing Regional Academic Health Centers (RAHC) in Amarillo, El Paso, Lubbock and Odessa, the long distances patients had to travel to receive necessary care has been reduced.

Cavazos also noted that rural practitioners benefit from TTUHSC through patient consultation, long distance monitoring, referrals and access to services such as neonatal intensive care, burn intervention, pediatric surgery and renal transplant.

"These services, and others, were either not available or were not fully established in the West Texas area prior to the creation of TTUHSC," Cavazos said. "Consequently, patients were not served or had to be transported hundreds of miles to other cities."

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The establishment or refinement of these services have borne fruit in numerous ways. For example, before the presence of TTUHSC, the West Texas area was plagued with the highest infant mortality rate not only in the state, but also in the southwest.

"With the construction of the RAHC in Lubbock and its teaching hospital Lubbock General Hospital, a neonatal intensive care unit was established that has contributed greatly to lowering the infant mortality rates to not only below those of the rest of Texas, but also below those of the nation," Cavazos said.

CONTACT: K. Hopper

48-2-13-87

LUBBOCK--A state-of-the-art computer lab in the Texas Tech University College of Home Economics includes the capability for computer-assisted interior design classes and restaurant and hotel management teaching.

Dr. Janet Schrock, who teaches in the Merchandising, Environmental Design and Consumer Economics Department, said the computer system can aid in drafting and drawing in environmental design classes.

"In interior design, it's like having an electronic T-square and triangle," she said. "It won't completely replace manual drafting and drawing, but computer-aided drafting is more accurate than manual drawing."

Currently students in environmental design classes and in restaurant, hotel and institutional management classes use the computer lab. Some graduate students also use the lab in their class work.

The computer lab can be used for general purposes, such as word processing, spreadsheets, data base management and graphics, Janet Schrock said.

More specialized tasks include working hotel front desk tasks, controlling environmental concerns, managing menus and food services in restaurants, analyzing nutrition in diets and determining costs of foods.

Dr. Jay Schrock of the restaurant, hotel and institutional management faculty said most of the businesses that will employ his students use computer systems to help management.

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Businesses now use computers for hotel reservations, guest check-ins, menu selections, food costs and other repetitious management functions.

"Computers can take care of the more mundane chores and can give employees more time to interact with the guests on a personal basis," Jay Schrock said. "We now have the facilities to train the students to deal with management functions that require computers. We're using the same programs that are in operation in industry."

"For example, if a guest checks into a hotel with a list of room specifications, the room clerk can visit with the guest while the computer is shuffling through the available rooms and matching the guest's specifications," he said.

Computers are used in some restaurants for transferring menu orders from waiters or waitresses to appropriate kitchen areas. Servers are more effective because they can put the information into the computer, Jay Schrock said.

"The liquor order will go to the bar, and the entre and dinner order will go to the kitchen. The entire order is clocked, and the server can better know when the order was taken and when the food was delivered," he said.

Restaurant and hotel managers who are concerned about energy conservation can use a computer to control environmental concerns, Jay Schrock said.

"The temperature in rooms can accommodate guests who want cool rooms and warm rooms. Computer systems also can control the building's safety systems, such as fire alarms," he said.

The computer training will make students more marketable. The students will become knowledgeable users and will be better able to evaluate various computer programs, Jay Schrock said.

"We thought the system offered forward-looking technology," said Janet Schrock, who chairs the computer user's committee in the College of Home Economics.

"I think the computer lab makes the students more marketable because they have the computer experience and they can learn about technology in the industries and fields they will enter in the real world," she said.

The Home Economics Computer Learning Center has 21 networked Texas Instruments Business-Pro computers that are compatible with IBM/AT personal computers.

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49-2-12-87

COMPUTER FUTURE--Senior environmental design students Tina Mitchell, left, from College Station, and Nancy Munnerlyn, from Conroe, work in the new computer lab in the College of Home Economics. The computer system can aid in drafting in interior design. (Tech Photo)

Texas Tech News

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50-2-12-87

LUBBOCK--Photographs and rock specimens taken during explorations of Antarctica will be displayed at The Museum of Texas Tech University in honor of the late F. Alton Wade, a former Texas Tech faculty member who devoted his life to exploring the mysterious, frigid continent.

"Dr. F. Alton Wade: Explorer/Scientist" will be displayed in Gallery 4 of The Museum Feb. 22 through May 1988. The exhibit is free.

Wade was chairman of the Texas Tech Department of Geology from 1954-1964 and was named Horn Professor of Geosciences, the highest honor given Texas Tech faculty by the university's Board of Regents. He was a research associate at The Museum from 1973 until his death in 1978.

The exhibit will include photographs which Wade took during his many trips to the Antarctic and which are part of The Museum's permanent collection.

Geological specimens collected by other Texas Tech researchers who were influenced by Wade to study Antarctica will be exhibited. Personal artifacts, such as a parka and ski poles worn by the explorers, will also help tell the story.

One of the highlights of the exhibit is a wind-sculptured rock which museum science Professor Sankar Chatterjee brought back from his 1983 trip. The pink granite rock was taken from the Dry Valleys in Antarctica -- places where the wind, blowing sand and ice have swept away the ice, uncovering rock which has been sculpted by nature over the years.

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Wade earned bachelor's and master's degrees in chemistry and geology from Kenyon College in Gambier, Ohio. After working as a research chemist and teacher, he began work on a doctorate in geology at Johns Hopkins University.

Wade became fascinated with Antarctica by reading accounts of explorers and began corresponding with Admiral Richard Byrd, the leader of early Antarctic expeditions. Wade was notified a day in advance that he had been selected as a member of the transport ship's crew for the Second Byrd Expedition to Marie Byrd Land in Antarctica. He spent 77 days exploring uncharted areas of the continent.

For a 1939 Byrd expedition, Wade was made senior scientist. He spent the winter there studying ice layers and temperatures in tunnels which were cut below the ice.

Wade made several other trips to the Antarctic. He was in command of an Army Air Corps group on the Greenland ice cap in 1943 and helped write survival manuals for soldiers in polar regions.

He received two Congressional Medals for his work with Admiral Byrd and the Meritorious Civilian Service Award for his work with the Armed Forces. A 13,500-foot Antarctic mountain was named after him and a book, "Antarctic Geoscience," was dedicated in his memory.

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51-2-12-87

LUBBOCK--Visiting artist David Merkel will install his sculpture "Marker" Monday (Feb. 16) outside the Texas Tech University Art Building. Merkel also will present a free slide lecture 7 p.m. Tuesday in Room B01 of the Art Building.

Merkel's "Marker" is a sequence of three 25-foot-long, blue-and-grey-striped, pointed wooden poles propped up at an angle on roped wooden bipods.

Known for his use of basic geometric forms, such as horizontal walls, open cylinders and tall rectangles, Merkel frequently includes brightly striped poles in his sculptures.

Merkel's sculpture, which will remain at Texas Tech for a year, was one of more than 130 pieces in the Texas Sculpture Symposium in 1985 in Dallas.

A May 1985 article in Texas Monthly said, "Merkel's work has the energy of sheer stylistic anarchy -- is it pop, funk, neoprimitive, or postminimal?"

Merkel, who received a bachelor of fine arts degree in 1976 from the University of Wisconsin-Milwaukee, is a founder of Open Doors, a studio and gallery tour in the "Deep Ellum" artists' neighborhood in Dallas.

His work has been shown in Chicago, Fort Worth, Houston, Garland, Dallas, Arkansas, New York, San Antonio, Las Vegas, Nev., Memphis, Tenn., Spokane, Wash. and Wisconsin.

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52-2-12-87

LUBBOCK--A matching gift program has been announced by Texas Tech President Lauro F. Cavazos for university faculty and staff contributing to endowments during the Enterprise Campaign.

Under the program, Texas Tech faculty and staff creating new endowment funds or contributing to existing endowment funds will have those gifts matched dollar for dollar.

The program, approved by the Texas Tech Boards of Regents at their January meeting, applies to gifts given during the Enterprise Campaign, the university's first capital campaign. Launched in 1985, the Enterprise Campaign is seeking \$60 million and is emphasizing endowment funding.

To date, the campaign has received or been pledged \$48 million, including more than \$16 million dedicated to enhancing Texas Tech's endowments.

Executive Director of Development John A. Anderson said funds totaling \$100,000 for the university and \$25,000 for the health sciences center have been set aside to match donations by faculty and staff.

For donations to be matched, they must meet the following criteria:

*Contributions must be for endowment and donated to the university, health sciences center, Texas Tech University Foundation, Texas Tech Medical Foundation or Texas Tech Law School Foundation.

*Contributions will be accepted for any valid faculty, student, department, institute, center, program, school or college endowment, including scholarships, fellowships, lectureships, professorships, chairs, research or others.

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*Gifts cannot be for direct benefit of a specific faculty or staff member or a family member.

*Eligible contributions are those designated for endowment between Sept. 1, 1983, and Dec. 31, 1987, and meeting all other criteria.

*Contributions will be matched dollar for dollar, on a first given, first matched basis until the existing matching gift fund is depleted. Contributions received after the initial fund is depleted will be prioritized and matched as funds become available. If insufficient matching funds become available, faculty and staff donors can opt to have their gift returned.

*Donations must be from a full-time or a retired faculty or staff member. If sufficient funds become available, contributions from spouses, part-time employees and adjunct and visiting faculty will be matched at the conclusion of the special program.

*No minimum contribution must be met for a donation to an existing endowment fund, but a minimum \$2,500 gift is necessary to establish a new "named" endowment. Donations may be pooled by contributors to establish an endowment at the minimum level.

Information on participating in the matching gift program is available from the Office of Development, 742-1776.

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CONTACT: Sally Logue Post

54-2-13-87

LUBBOCK--Using non-traditional marketing cycles could help ranchers increase their profits.

Texas Tech University range management Professor Bill E. Dahl and agricultural economics Professor Don E. Ethridge have received a \$62,466 grant from the U.S. Department of Agriculture Rangeland Research Grants Program to examine alternative production and marketing systems for southwest cattle ranchers.

Dahl said the objective of the two-year project is to evaluate potential increases from using the production flexibility offered by improved pastures in conjunction with alternative marketing strategies associated with livestock price patterns.

"Livestock ranches in the arid and semi-arid Southwestern U.S. are extensive operations requiring more land per animal than in higher rainfall areas," Dr. Dahl said. "Those operations are also exposed to high risks due to high variability in annual rainfall and livestock prices."

Dahl said that brush and noxious weed infestations that are typical in the Southwest pose additional problems since they further limit the number of animals an acre of land will handle for and, consequently, the income generating potential of that land.

The High and Rolling Plains of Texas generally consist of cow-calf or stocker cattle operations. Those stocker cattle enterprises typically buy cattle in the spring at high prices and sell in the fall for low prices. The cattle are bought in the spring because grasses are available to support the animals, he said.

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"It's those seasonal price patterns combined with the production constraints of native rangeland that impose economic losses on many ranches," Dahl said. "However, if ranchers will devote a small portion of a ranch to high-yielding grasses, ranchers can use those sites to carry cattle during the winter off-season. This will enable the rancher to sell his cattle in the spring when the prices are much higher."

Using the Texas Tech Experimental Ranch at Justiceburg as a model, Dahl and Ethridge will look at what forages, based on soil type, season and expected animal performance, will be necessary to implement their alternate marketing strategy.

Dahl said the project will not concentrate on what forages will be best, as well as determine seasonal price patterns for different livestock classes, develop budgets for the various production/marketing options developed in the project, determine how to maximize net revenue combinations for specific ranch resource conditions and determine strategies for managing weather and price risks.

"Because the livestock industry has never been directly subsidized by price supports, the project is important because we can offer possible marketing strategies that will increase profit potential for livestock producers beyond what they are working with now," Dahl said.