

# IN VIVO

Newsletter of the University of Tennessee Division of Biology

VOLUME 4, NUMBER 1

APRIL - MAY 2004

## Core Biology gets a new face

**Dr. Randy Brewton** is the interim coordinator for the Core Biology program. This spring he also teaching BCMB 402 and Biology 140 for Biology majors. His background is in teaching and research, but his new position has him involved in administration.

Being on the planning side of a program has given him a greater appreciation for its inner workings. He is involved in enrollment, laboratory



**Dr. Brewton lectures for Biology 102**

equipment and supplies, and recruiting instructors and graduate students to teach. However, Randy is not content to just hold to the status quo. He has new ideas and program goals specifically aimed at undergraduate non-majors.

He said, "I want us to provide students with experience beyond just lecture and lab time. Biology is what is all around us; it's not just memorizing unfamiliar Latin words. We can make Biology more relevant for our non-majors." Randy has organized a partnership with Ijams Nature Center ([www.ijams.org](http://www.ijams.org)) to provide hands-on workshops for the students. As part of its mission to enhance environmental awareness in the general community, Ijams maintains a grant from the Knoxville Utilities Board and local television station WBIR to provide a series of "Living Clean and Green" workshops

throughout the year. Naturalists at Ijams have added several workshops specifically for UT students taking Biology 102. Example topics are "Is your creek healthy?" and "Frogs: environmental warning signs."

Randy is encouraging students to attend one of these seminars and write a summary on their experience. He said, "This is just one way to help non-majors connect personally with Biology in the world around them. It's designed to be more engaging and accessible than standard class work."

He is looking for additional 'hands-on' opportunities for the students. He wants to organize a "river rescue" or "adopt a creek" for the class. His target is Second Creek which cuts across campus and empties into the Tennessee River near the Neyland Biology Annex (NBA) building. Randy feels it would give the students ownership as well as benefit that part of the creek.

His work to bring students closer to the environment does not stop with workshops. Currently he is enhancing the NBA by refurbishing a terrarium and adding display cases with various items he has gathered over the years or found in storage. Among other items, he has a cat skeleton, horseshoe crabs, and sea shells. He said, "I'd like the NBA to be more visually engaging - even in the hallways."

Randy is originally from Hattiesburg, Mississippi. He received his bachelor's degree from the University of Southern Mississippi in 1981. Even at the start, he was focused on academics instead of

**See BREWTON, on page 3**

## From the Director

By **Otto J. Schwarz, Ph.D.**



Good day to all our readers. If you happened to be in a quiet place on the last few days in April, you might just have heard a long sigh of relief by those faculty and

graduate students who were completing their teaching duties for the spring 2004 semester. The groans in the distant background were students in the process of girding their loins for the coming onslaught of final exams.

Perspective is a wonderful thing because as I look back (way back) at my own college experience I recall a time of great effort and occasionally considerable stress, however, almost always followed by a wonderful sense of accomplishment and freedom. As an undergraduate that meant pure freedom to relax, as a graduate student a moment or two to reflect and regroup ones thoughts and then off to the laboratory to push back the frontiers of knowledge, hopefully in the appropriate direction.

After two years as Division Director I have come to be accustomed to what seems to be an endless opportunity for problem solving coupled with finding new and effective ways to help faculty, staff and students to succeed in their professional, academic and even personal endeavors.

**See DIRECTOR, on page 2**

### Table of Contents

From the Director .....	1
Spotlight on the Division .....	1
Renovation updates .....	4
Focus on alumni.....	6
Division news.....	8

## DIRECTOR, from page 1

The Division's latest challenge is to provide for and facilitate the redeployment of the entirety of the Botany Department. A deadline of May 1 was given to Botany to assemble a plan for reassignment of its people and physical assets. They and I have been assured that all existing faculty and staff will have a new home provided for them. The long term problem for the Division and the University will be to continue to provide for the representation of the Botanical Sciences at a level commensurate with the mission of The University of Tennessee as a land grant institution.

Several moves toward redeployment have already been made; two of these directly affect the Division office. The newly renovated Botany Field Station located across from the Greenbrier entrance to the Great Smoky Mountains National Park, will at least for the time being, be brought under this office's direct responsibility. The formal opening/ dedication of the facility is in the planning stage, but should occur during the late summer, early fall of this year. More about this in the next edition of *In Vivo*.

The Division sincerely appreciates the never tiring efforts of the BSF staff for the beautiful job done in the renovation of the field station's buildings. Take a minute and visit the Division's web site (<http://web.bio.utk.edu/division>) and click on the Botany Field Station link and browse through the pictures of the facility, you will see why we are so excited about its use and potential to serve UT Biology.

The second affect of redeployment on the Division is the recommendation of Botany to move its two-semester freshman course in General Botany under Division auspices. Over the years this course series has served literally tens of thousands of students from non-majors looking for a laboratory science to fulfill University degree requirements, to both Botany and Agriculture majors needing the basics of plant biology to function in their respective professions. The course will continue its level of excellence. It will be listed with a Biology course number retaining its original title as listed above. One of the long term challenges will be to maintain the high quality of faculty and graduate


student staffing that have supported these two courses.

We have included a sprinkling of the activities of the Division in this issue, so spend a few moments touring the Botany/ Division Field Station as well as your own personal walkthrough of Hesler's renovation in progress. We have had a staffing change with the loss of **Dr. Pat Cox**, our former CORE laboratory coordinator, to Heritage Program Botanist for TVA. The Coordinator position is currently being ably filled by **Dr. Randy Brewton** (see lead article, this issue).

A section devoted to Division Alumni profiles an alumna of the Botany Department, **Dr. Lisa K. Jennings**, currently the Director of the Vascular Biology Center of Excellence in Memphis, Tenn. She has a special place in this director's heart as she appeared at my laboratory door one day a long time ago looking to get involved in "some sort" of research project. She stayed for several semesters as an undergraduate research participant. Seems that she has never left the laboratory.

I would like to acknowledge the continuing efforts of **Jan Hudson**, whose work responsibility is to coordinate our Biology 140 laboratories, in her continuing dedication to organizing the annual "Friends of Biology" Golf Tournament. It was a success again this year, with fun being had by all. All funds raised are placed in the Division's graduate student support fund.

Finally, I would like to express my appreciation and I am sure the appreciation of all who frequent "The Hill" to the efforts of **Dr. Ken McFarland** in his continuing dedication to campus beautification/student education through the creation and maintenance of the Gardens on The Hill in front of Ayers Hall. If you are on campus this summer and early fall take a moment and stroll through the current garden. No matter what, your attitude will improve and that "stress" will melt away.

Have a wonderful summer, talk to you soon. 

Peace,  
Otto

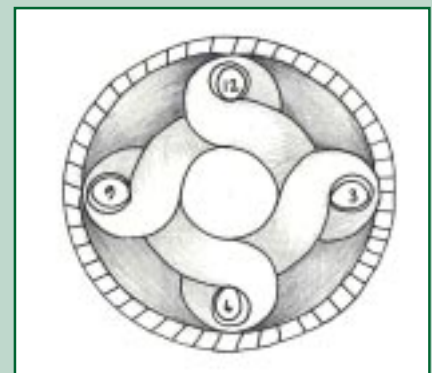
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## Garden News

The University of Tennessee Botanical Garden, located in the inner circle of the The Hill will display its newest addition to the beautification of UT's campus - - a Floral Clock-Knot Garden. Traditional clock gardens use small herbaceous plants to create an image of a clock face with numbers and display time with hour and minute hands driven by a mechanical clock.

Many people know plants like 4 o'clock and night blooming cereus which open their flowers at specific time of the day or have noticed some plant flower's open at sunrise and close at sun set. Collectively around the world there are many plants with specific flower opening times which can be used to create a 24 hour clock. According to the director of the project, **Dr. Kenneth McFarland**, the floral clock garden on The Hill is patterned after the Ayers Hall tower clock face (which lacks numbers or hands).

The time keepers of this clock are not hands but rather are strategically placed plants with flowers which open approximately at 3 - 6 - 9 - and 12 o'clock, as designed by **Shinara Taylor** (see image below). The clock plants are imbedded at the outer edge of a circular knot garden which creates the background of the clocks face.



The flowers of Ice Plant (*Delasperma nubigenum*) a native of South Africa opens at 12 o'clock; those of Sand wort (*Arenaria Montana*) native to the mountains of Europe opens at 3 o'clock; those of Menge's Fame Flower a rare plant native of the south eastern states found in only three counties in Tennessee open at

**See GARDEN, on page 3**

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### BREWTON, from page 1

pre-med. He came to Tennessee and received his Ph.D. from the former Zoology department under the tutelage of **Dr. Jeff MacCabe**. His emphasis was on cellular and molecular biology.

In 1987 he moved to the University of Alabama at Birmingham where he worked as a postdoctoral student for nearly six years comparing the extracellular matrix of cartilage and the vitreous humor of the eye. During this time, he and his former wife adopted their son **Nicolas** from Paraguay. They then moved to Tampa, Florida where Randy worked as a research fellow at Shriners Hospital for Children.

He moved to Amarillo, Texas in 1997, but missed the rolling hills of the south-east. He returned to Tennessee in 2000 to work with **Dr. Ron Wetzel's** Alzheimer's Research group at UT Medical Center. He eventually moved to the Department of Biochemistry, Cellular and Molecular Biology on the UT campus. He began teaching full-time and has embraced his current position where he could put into action some of his new ideas. 

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### GARDEN, from page 2

6 o'clock and those of Wild Marigold (*Tagetes minuta*) native to southern South America, opens at 9 o'clock. The calendar date and time of day these clock plants bloom in relation to their pollinator's presence. However, do not expect to set your watch by the floral clock since not all plants will be in flower on the same day.

To achieve the knot garden design different shaped and colored plants are utilized. A green hedge forms the knot with yellow and red foliage plants creating backgrounds. The undergraduate staff will be trimming and edging the plants frequently to maintain the knot appearance observable all summer.

The Hill garden also contains many other unique plant features. Including plants the Native people of the Tennessee Valley gardened thousands of years ago, several rare and endangered plants of Tennessee, economical plants rarely

*See GARDEN, on back page*

# Botany Field Station is open for business

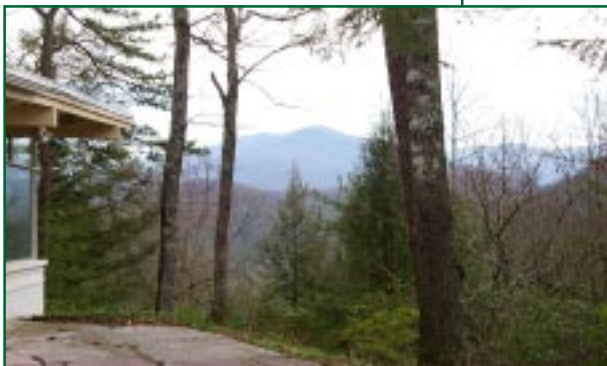
Surrounded by 17 acres of forest and flowering shrubs, the Division of Biology Field Station awaits its first visitors. Renovations are complete on the complex, which is located in the Greenbrier area of Gatlinburg. The



**The West Wing**

overwhelming beauty of its location should be sufficient to cause even the most fatigued scientist to focus on his/her research.

Thus a major purpose of the Field Station is to provide laboratory space to faculty, visiting faculty, staff and graduate students of the University of Tennessee. It can also be reserved for



**Mountain views**

departmental, staff, and laboratory staff retreats, as well as faculty-led field trips. It can be reserved for either day use only or as overnight accommodations.

The facility provides a convenient base from which to conduct field research in the adjacent Great Smoky Mountains National Park.

New opportunities for its use arise daily. For example, the facility has hosted groups from the All-Taxa Biodiversity Institute by providing

laboratory space for sorting field samples collected in the National Park.

The complex is composed of two separate houses connected by laboratory space. The "Laboratory/Shop" section is set up for wet lab usage. It has a sink, refrigerator with freezer, and internet connections. It also houses the laundry facility.

The West Wing, or "Small House", as it has been nicknamed, has a

kitchen, living room, conference area, one bedroom and a bath. The expansive windows in the conference area have an open view of Mt. Leconte.

The East Wing, or "Big House", also

has a kitchen, dining area, and living room. In this wing are two bedrooms, one and a half baths, and an extensive storage area. The windows from the dining area in this house face Mt. Guyot.

The kitchens in both wings have all new

appliances and are fully stocked with cooking and house-keeping supplies. The bedroom in the Small House has one full-sized bed. The bedrooms in the Big House have one full-sized bed and four twins. Bedding, towels, and paper products are provided to make this complex com-

pletely self-sufficient for up to eight guests at a time. More can be accommodated if sleeping bags are used. All a visitor would have to bring would be personal items and food.

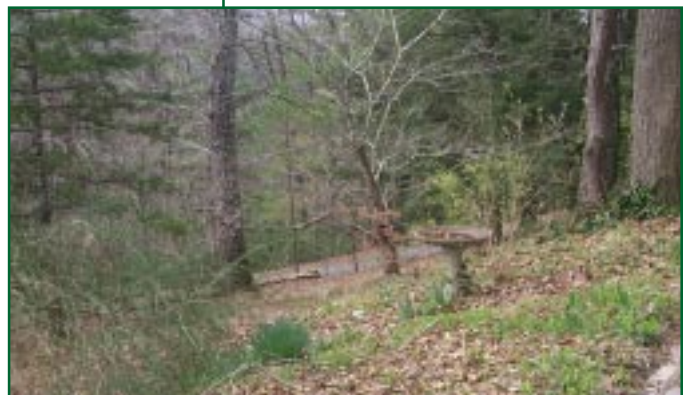
The full set of pictures of this facility can be viewed at [http://web.bio.utk.edu/bsf/Division\\_field\\_station.htm](http://web.bio.utk.edu/bsf/Division_field_station.htm). Also at this website is an overview of the user's manual. Reservations for this complex are now being taken by the Biology Service Facility (BSF). The BSF staff worked on the station for over a year in the renovation process and is now



**The East Wing**

charged with the upkeep and control of usage.

For more information, contact the BSF directly at (865) 974-4219 or via e-mail at [ddockery@utk.edu](mailto:ddockery@utk.edu).



**Wooded surroundings**

# Progress with Hesler renovation

Renovations to the old section of Hesler Biology Building are nearing completion. The hoped move in time is Christmas break this year and all appears to be on schedule.



**Picture 1**

This side of Hesler houses departmental offices and faculty laboratory space.

Because of the age of the building, major changes had to be made to the structure just to bring it up to industry code.

For example, the second floor had to be rebuilt to accommodate new load-bearing standards (see picture 1).

New air conditioning, duct-work, vent systems had to be installed (see picture 2 of new air filtration system).

On the side of the building next to Neilsen Physics Building, a new



**Picture 2**

loading dock and elevator tower is being constructed. The elevator will be mostly glass and the loading dock will have a hydraulic system that will level itself automatically with delivery trucks (see picture 3).

The departmental offices will have commons areas for the faculty and staff and are designed in suites



**Picture 3**

to accommodate meetings and casual interactions (see picture 4). The offices are primarily for the Ecology and



**Picture 4**

Evolutionary Biology (EEB) faculty, but there will also be a satellite office for Biochemistry, Cellular and Molecular Biology (BCMB).



**Picture 5**

The faculty laboratories are designed specifically for the needs of each faculty member. The new fish collection room (see picture 5) is specially designed to hold the weight of several thousand collection jars and shelves.

The most noticeable addition to Hesler is the overhead walkway that will connect Hesler to the third floor

of the Austin Peay Building. This will connect the Austin Peay offices of the Mathematical Ecology suites to the



**Picture 6**


Hesler" is renovated, work will be on "new Hesler".

This wing of the building will be



**Picture 7**

exclusively classrooms and wet

laboratory space. The work will not be as extensive as it was on the "old Hesler" side. It is hoped that the entire Hesler Building will be open for business by Spring 2006. 

## In Vivo

An alumni newsletter published by the Division of Biology  
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## Alumna muses on memories of UT



"I had a very positive experience at UT. My classes and experience in the Botany Department were a terrific foundation for my graduate work and ultimately for my career," said **Dr. Lisa K. Jennings**, Professor of the Department of Medicine and Director of the Vascular Biology Center of Excellence in Memphis, Tenn.

Dr. Jennings got her start in biological sciences in high school in her home town of Kingsport, Tenn. Her science fair project, on the effects of magnetism on the germination and growth of seeds, took her as far as the national level of the Junior Science and Humanities Symposium. Her efforts won her scholarship money along the way and she put it to good use at UT in 1973.

Her major was Botany with a minor in Biology. When she arrived on campus she said, "I was fortunate to learn that **Dr. Otto Schwarz** was sponsoring undergraduate research in plant physiology. While I learned a great deal there in regards to plant physiology and how to conduct assays that measured enzyme activity, I particularly appreciated the way he always made himself available to the students. He would make himself available on Saturday mornings at McDonald's on Cumberland Avenue answering our questions and getting to know us."

She finished her degree at UT in 1976 and moved to Memphis with her

soon-to-be husband, **David K. Jennings**, who had entered UT Medical School. She in turn, entered graduate school at the University of Memphis in the Cell Biology program. Through her efforts and connections with Dr. Schwarz, she was able to work with **Dr. Charlie Warren** of Rhodes College for her master's thesis work.

Upon graduation in 1978 she began work at St. Jude Children's Research Hospital. It was here that her focus changed from plants to human physiology. Her boss, **Dr. David Phillips**, was a recognized expert in platelet physiology and soon that research would attract Dr. Jennings full-time.

As her husband entered his residency as an Internal Medicine physician, she began her doctoral work at UT Memphis. She received her Ph.D. in 1983 and spent two years as a post-doctoral fellow at St. Jude. In 1985 she became an Assistant Professor jointly in the Departments of Molecular Science and Medicine (Hematology Division) at UT Memphis. In 1990, she became an Associate Professor and in 1998, she was granted full Professorship with tenure. During that time, she added other joint appointments with the Departments of Surgery and Biomedical Engineering.


In 1999 she became the Director of the Vascular Biology Program ([www.utmem.edu/vascular](http://www.utmem.edu/vascular)), which was the first of its kind to integrate thematic bench, translational and clinical research across Departments and Colleges on the campus. In 2001 the program was awarded Center of Excellence status and has shown an 8.5 return on investment through productive Center faculty receiving peer reviewed grants and contracts.

Her current research interests are in the areas of thrombosis, vascular injury and tumor growth. She focuses on the glycoprotein GPIIb-IIIa receptor, a surface protein responsible for platelet aggregation. She is particularly interested in the structure and function of this

receptor on the platelet surface and the use of blocking agents to reduce platelet related heart attack and stroke. Her work led to the further identification of similar receptors in other cells and the development of drugs and therapies to reduce thrombosis in heart disease by stemming the hyperactivity of platelets in the blood.

Her research and the research of other Center faculty also has ties to tumor growth and migration in both prostate and breast cancers. In the breast cancer research program, she and collaborators are focusing on the protein CD9 where the control of cell surface DC9 expression correlates with tumor cell growth.

With her busy schedule she still finds time to reach out to her community through various American Heart Association programs where she speaks to area organizations about vascular disease and risk factors of heart attack and stroke. She serves as President of the Shelby Co. Division of the American Heart Association. Her husband is now a staff physician of the Church Health Center and they have two children, **Ian**, a sophomore at Rice University and **Laura**, a junior at St. Mary's School.

Most recently, she was on the initial list of confirmed candidates for President of the University of Tennessee. She said, "It was an honor to be on the list." 

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The "Friends of Biology" Golf Tournament was held on April 29, 2004. The following are the winners in each category.

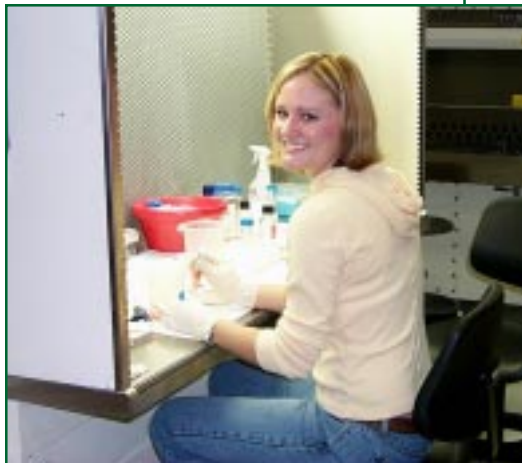
First place team: **Mark Boyd, Greg Anderson, Marc Robinson, and Mary Kelley**. Second place team: **Jan Hudson, Rick Hicks, Eric Jones, and Michael Delarino**.

Closest to the pins: **Paul Carter, Jim Hall, and Cynthia Peterson**.

Longest drives: **Eric Jones and Debora Baldwin**.

## Graduate student on her way to Memphis

Microbiology undergraduate student **Anna Hollmann** recently learned that she has been accepted into the Pediatric Oncology Education (POE) program at St. Jude Children's Research Hospital, Memphis.



Gaining a place in this program is very competitive, and less than 20% of applications are successful. The POE


program is funded by the National Institutes of Health/National Cancer Institute, and is designed to give outstanding students an experience of biomedical research.

Anna will spend 10-12 weeks at St. Jude this summer working in the laboratory of **Dr. Richard Webby**, a New Zealander, in the Department of Infectious Diseases, Division of Virology. (Anna has conscientiously prepared for her time at St. Jude by compiling a collection of "Kiwi jokes" that provides insights into how to interact with New Zealanders).

At St. Jude, Anna will investigate the role of the NS gene in the virulence of H5N1 influenza A viruses that were responsible for lethal human infections in Hong Kong recently. The initial step will be to prepare recombinant viruses by intro-

ducing the NS genes of interest into an avirulent laboratory strain of influenza virus.

Anna will link her St. Jude research to later work that she will undertake at UT in the laboratory of **Dr. Mark Sangster** in the Department of Microbiology. In Dr. Sangster's lab, Anna will analyze immune responses to the recombinant viruses that she prepared at St. Jude. These studies will indicate whether certain NS genes can make influenza viruses more dangerous. Anna is in the College Scholars Program at UT, and will produce a thesis based on her research.

Anna, a serious student still finds time for pursuits outside of the lab. She is a member of the UT equestrian team and is currently the team's secretary-treasurer. Her long-term goal is to complete an MD/PhD program. 

## Alumni News

**Dr. Denise Michavowicz Singer** received a degree in Biology in 1998 and then graduated from the UT College of Veterinarian Medicine in 1994. She married **Joe Singer** in 1989 and opened her own small animal veterinary practice in 1998 in Joelton, Tenn.

She received the Tennessee Veterinary Medical Association Young Veterinarian of the Year award for the year 2000. She had her first child, **Nicole Ray Anne** in March 2002.

## New Life Sciences Librarian

**Donna Braquet** joined the UT Library faculty this spring as the new Life Sciences Librarian and will be the liaison to General Biology, Microbiology, and BCMB. Her colleague, **Ron Gilmour**, will continue to work with EEB and Botany. She is responsible for collection development in these three areas, which consists of pur-

chasing books, journals, databases, and reference sources. While new journals and databases are often difficult to purchase, she appreciates having input of faculty priorities.

Books and other one-time purchases are easily acquired, so please send her your recommendations. She is also responsible for instruction in these areas which includes library orientations, workshops and course-specific sessions. She is particularly interested in collaborating with faculty to integrate research skills (sometimes referred to as Information Literacy) into biology classes. Please contact her if you would like to request a customized library session or would like to collaborate in creating a successful library component for your classes. She looks forward to working with you and your students.

A monthly e-newsletter, Library Uptake and SciTech @ UT Libraries, a web log about science related library events and resources, as well as her contact information can be found on her webpage: <http://www.lib.utk.edu/people/braquet.html>. 

## A hero among us

Professor Emeritus of the Department of Ecology and Evolutionary Biology, **Dr. David Etnier**, received the Tennessee Clean Water Network's *Bill Russell River Hero Award* on April 7, 2004. He is the first recipient of this annual award.

Dr. Etnier is responsible for starting one of the largest collections of freshwater and marine fish with over 300,000 species. He started the collection in 1966 and says it is in the top 20 in North America.

He is better known for his famous compendium *The Fishes of Tennessee* and for the discovery of the snail darter that delayed the building of the Tellico dam.

Although he is retired from the University, he is a frequent visitor by maintaining his work with the fish collection and in the classroom.



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# IN VIVO

Newsletter of the University of Tennessee Division of Biology

VOLUME 4, NUMBER 1

APRIL - MAY 2004



## **GARDEN, from page 3**

seen in the Tennessee country side, butterfly and hummingbird-attracting plants and other unique plants of botanical interest.

The existence of this project is tied directly to your donations. The Botany Department is selling the sunflower poster by Botany emeritus professor, **Dr. Alan Heilman** at \$10 each in order to finance the garden facilities. If you would like to buy a poster (see picture) or make a straight donation, please contact the office at (865) 974-2256 or through their website at <http://fp.bio.utk.edu/botany>.

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