

Dorcas investigates rubber boas

Speaker discusses his research on the lives of a variety of snake

BY MORGAN DOWNER
Staff Writer

Dr. Michael Dorcas, who has studied thermal biology's relationship to ecological history at Idaho State University, has been researching the rubber boa, a brownish-green snake that inhabits the sage bushes of Idaho.

A snake's temperature is affected by the physical environment outside it, and this temperature affects the biological functions. So, on a cold day, everything from simple oxygen intake to crawling speed is diminished. Snakes seem to undergo a mild hibernation in moderate temperatures, as well as being totally active or dormant in winter or summer.

The body temperature of a snake, Dorcas explained, comes about due to the interaction of animal characteristics such as size and color and abiotic factors such as solar radiation, air temperature, and ground temperature. These produce a range of possible body temperatures. The behavior of the snake, such as if it were to crawl into the sunlight, produces the actual temperature.

The behavior, however, can be influenced by

ecological factors. For instance, the presence of a hawk would prevent a snake from crawling into the sun. This temperature then affects the speed of the functions in the snake's body, which in turn has an ecological effect in that a slow snake cannot catch as much prey or escape as many predators. So, as natural selection acts to eliminate the less effective genetics in the snake population, the animal characteristics are in turn affected.

This is the theory of co-adaptation, behavior matching physiology. Dorcas's research consisted of testing the theory as applied to the rubber boa. Does this theory fit, he asked, and if not, why not?

A dated method of determining a snake's temperature was to simply catch one and take its temperature, in the "grab-and-jab" method. Instead, Dorcas surgically implanted radio transmitters into the snakes. Rubber boas take on this light burden well, and so were chosen to be studied. They also do well in the lab.

Rubber boas are a type of boa constrictor, in the same family as the 30-foot-long anaconda, though rubber boas are significantly shorter, about two feet long.

These snakes, despite recovering well from their surgeries, are not the easiest snakes to work with. They are very secretive. Also, when grabbed or threatened, they give off a terrible smell and a toothpaste-like substance that burns the skin and eyes.

In order to carry out his research, Dorcas had to perform three specific tasks. He measured the snakes' body temperature variation in the field. Then, in the lab, he measured the thermal dependence of multiply biological functions. Finally, in order to determine the extent of co-adaptation, Dorcas compared the findings to see if the activities coincide with the body temperatures.

In the fieldwork area, Dorcas recorded the temperature from afar, so that he could continue to observe the snakes' patterns underground. Dorcas also planted snake models, long copper pipes, in direct sunlight, in the shade, and underground in order to get a range of all possible temperatures.

Next, Dorcas measured the thermal dependence of different biological functions in the lab. He looked specifically at six functions: crawling speed, escape speed, tongue flicking, gastric digestive rate, passage rate, and oxygen consump-

tion. He measured the snakes' performances in each of these areas at different temperatures, trying to discover if they are most efficient at a certain temperature.

The ultimate results of the experiment were that while temperature did affect every function in some way, they were not all affected in the same way. The snakes' behavior, however, for the most part, matched the physiology.

The only anomaly is that the rubber boa is a nocturnal snake, even though the speed of this already slow snake is very much diminished at night. So, questioned Dorcas, why would the snake come out at night? There are several potential advantages to this behavior. First, magpies, the snakes' main predators, are a daytime hunter. Second, the rubber boa eats mice, mice are about at night, and at night the snake can stay out on the surface longer because there is no risk of overheating in order to catch them.

So why haven't the snakes evolved to be more physically suited to being nocturnal? Dorcas answered, there is just low selection pressure. Apparently, for escaping predators and finding food, the current system is working just fine.

New PCC Members learn about alcohol use and abuse

Judge Vic Fleming speaks during Alcohol Awareness Week

BY MEREDITH BEATTIE
Staff Writer

On Monday evening, first-year eating house members and fraternity house pledges participated in the second part of the New Member Series implemented by Patterson Court this year. This program, designed to address the issue of alcohol use and abuse, is the first comprehensive mandatory program of its kind.

The first part of the program began last Thursday, when members of the Mecklenburg County chapter of MADD (Mothers Against Drunk Driving) presented their program. It consisted of a combination of the statistics that students hear often. Illustrating the truth of these statistics were personal stories that made these numbers more tangible and more alarming.

However, Monday's program by Judge Fleming of Little Rock, Ark., brought both a different perspective and a lighter approach to the dangers of alcohol abuse.

For a number of years, Fleming has given a unique presentation to public high schools in Little Rock. By becoming involved with his children's activities, Fleming also became aware of the challenges and decisions facing teenagers, and of the amount and type of information available for them to make informed decisions.

Inspired and aided by the work of

Judge Michael Martone, Judge Fleming's program consists of actual trials held in the schools themselves, followed by a complementary speech. This program goes to public junior and high schools twice a month, a constant reinforcement of a message advising the dangers of drinking, especially in conjunction with vehicles.

Beyond high school students, Fleming felt that there was another audience in need of the information he possessed: college students. Recent studies have traced an increase in binge drinking on college campuses. Events show the tragedies that often accompany this behavior, such as the death of two freshmen at Louisiana State University and MIT. "I wanted to bring my program to the college level," said Fleming, "and a great place to start would be at my alma mater, Davidson College."

After approaching Dean of Students Tom Shandley about presenting his program, Fleming worked with Health Advisor Georgia Ringle and Patterson Court Advisor Jim Barber.

Fleming's college program has been modified to incorporate information pertinent to college-age students. Though there was no court trial, a presentation of a video showing one of his trials was shown at the beginning of the program.

Following this was statistical information and a video of one individual

who became a statistic. This young man killed his friend and injured his girlfriend while operating a car under the influence of alcohol. He, like many others to whom Judge Fleming alluded, seemed to have the same mentality that it would never happen to him.

Instead of approaching this mentality with the normal preaching method, Fleming used humor and specific strategies to bring his point home. He told anecdotal stories and passed out a driver's license-sized card, on which there was a chart to help identify the number of drinks people can drink safely according to weight and gender.

Among the humorous stories of his Phi Delta days, Fleming also stressed an aspect that enters into the picture of college life whenever drinking is involved: rape, specifically date rape. Fleming explained the penalties and made some suggestions of how to proceed if someone feels uncomfortable at all. He advised following gut instincts and escaping the situation before it becomes serious.

Fleming was by no means espousing drinking, but rather providing safety information in the event that drinking does occur. He provided a new perspective on how to make a better campus in terms of safety on both a personal level and with relationships.

Hamer speaks in 900 Room

Sexual orientation may be linked to genetics

BY MELISSA ANN DECASTRIQUE
Staff Writer

On Wednesday, Feb. 18, at 7:30 p.m., Dr. Dean Hamer of the National Institutes of Health presented a lecture entitled "Is Homosexuality Genetically Linked?" in the 900 Room.

Hamer cited three possible reasons as to why sexual orientation may be genetic. According to the research done by Hamer and his colleagues in the forms of brain studies, twin and nuclear family studies, and evolution analysis, a strong correlation exists between genes and sexual preference.

Hamer first informed the audience of the method used to gauge sexual preference, the Kinsey Scale. This scale has a zero to six range, with zero representing a completely heterosexual individual and six representing a completely homosexual individual. One's measurement on the scale is based on self-identification, attraction, fantasy, and behavior.

The typical male is placed on one end of the scale or another, whereas females are distributed among all seven scale degrees.

Hamer explained a study of pedigree patterns that had been done in the search for a genetic link between sexuality and genes. Upon analysis of pedigrees of gay males, researchers found that all gay male relatives tended to be on the mother's side. Hamer offered three possible explanations for the maternal transmission of sexual orientation: an X chromosome link, maternal imprinting, or a dominant gene with reduced reproduction.

Hamer also talked about a linkage

analysis involving the sibling-pair method, in which the genes of homosexual brothers were studied for similarities. This research revealed similarities on the Xq28 area of the X chromosome. Hamer summarized his studies by stating that these results confirmed a 1000-1 chance of a correlation between that gene and sexual orientation.

In addition to explaining the importance of this discovery, Hamer told the audience of scientific criticisms of the research. Since the research had only been done once and the link was only statistical, some scientists feel that the study's results may be misleading.

Also, the exact effects of Xq28 have yet to be determined. Researchers do not know if the genetic implications are direct or indirect. Hamer explained that although a strong correlation exists between genes and sexuality, one's sexual orientation is also probably a product of other factors, as well.

One of the main points of Hamer's lecture was to stress the importance of studying sexuality. Hamer believes that, had researchers known more about sexuality when AIDS was first publicly recognized, fewer deaths would have occurred, since more people would have known the causes of the HIV virus.

After expressing the danger of ignorance about sexual matters, Hamer took questions from the audience about sexual research on topics ranging from environmental influences to continuum genes.

Hamer recommended that students wanting to know more about sexual studies should read his book, "The Science of Desire."

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