HERPETOLOGY AT HUDDERSFIELD TECHNICAL COLLEGE

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INTRODUCTION

Huddersfield Technical College is a large educational institution whose prime objective is to educate and train people for future employment. The college's course portfolio includes training in the handling and husbandry of a wide range of animal species run by its well established Animal Care Unit. The College has an extensive range of courses on offer in this area, for example, NVQ2 Caring for Animals, NVQ Horse Care and Management, BTEC First Diploma in Animal Care and BTEC National Diploma in Animal Care, in addition to a series of short courses in specialist animal management. At present herpetology forms part of BTEC National Diploma but a distinct course in herpetology with a special herpetological qualification is planned.

Herpetology is a recent addition to the college's increasingly diverse educational programme and students are given excellent opportunities to learn about and study the biology, ecology and husbandry of herptiles through active first-hand involvement with a range of species.

The Herpetology Unit is part of a self-contained complex standing in its own grounds surrounded by mixed woodland. Also present are small mammal and bird units in addition to a facility for horticultural studies.

FACILITIES

The amphibians and reptiles are housed in a large temperature controlled complex and one of the most impressive enclosures (with an area of approximately 112 cubic metres) is a walk-in forest complete with artificial rainfall, pond and a waterfall (Fig 1). Here Green Iguanas *(Iguana iguana)* Asian Water Dragon *(Physignathus cocincinus)* Blue-Tongued Skinks *(Tiliqua scincoides)*, turtles *(Trachemy scripta elegans, Sternotherus odoratus* and *Cuora amboinensis)* move around freely thermoregulating through a series of strategically placed heat sources when the weather is overcast (see Iguana in Fig 2) or through natural sunshine on fine days. An adjoining section contains a number of smaller (1.23 x 0.6 x 0.3m) but structurally diverse housing units which hold a variety of lizard species that include lacertids, iguanids, geckos and skinks. Two species of snake, *Elaphe dione* and *Elaphe quatuorlineata,* are also housed in this area.

Thermal diversity through cage design with natural daylight and UV emitting lights are fundamental features of all the reptile enclosures.

The unit also contains several species of amphibians. One enclosure has both *Bombina orientalis* and *Cynops pyrrhogaster* whilst *Xenopus laevis* live in a well planted aquarium. Patrick Wisniewski of the Wildfowl and Wetlands Trust at Martin Mere recently donated several Marsupial Frogs *(Gastrotheca riobambae)* and Snake Necked Frogs *(Phrynomerus bifasciatus)* to the unit, adding to its ever increasing species diversity.

The Herpetological Unit has been developed to allow the keeping of amphibians and reptiles in as natural conditions as possible. It is hoped that such environments will induce naturalistic behaviour and eventually allow for a programme of captive breeding to be initiated. The livestock are expertly cared for by three technicians, Brenda Mills, Paul Radcliffe and Ian Birkinshaw who liaise with the unit's herpetologist, Roger Meek.

STUDENT RESEARCH PROJECTS

A research programme examining behaviour, thermoregulation and activity patterns in a number of species is currently being undertaken by several groups of students. For example Janet Fountain, Hayley Barugh, Anita Jubb, Marie Heywood, Michelle Hyland, John Cahill and Shane Malik are currently studying foraging and feeding habits, movement patterns, social behaviour and territoriality in female and juvenile Green Iguanas in our large tropical enclosure. In most lizard communities the main factors in niche differentiation are feeding, activity patterns and microhabitat selection. Social lizards such as Green Iguanas lend themselves to such studies as a result of their relatively sedentary behaviour, particularly if they can be observed at close quarters in a naturalistic environment. Stamps (1977) commented on the bias towards studies of male iguanas in the literature as a result of their more conspicuous and elaborate behaviour patterns.

Janet Fountain is also involved in gathering data on thermoregulation and activity patterns in the old world rat snakes *Elaphe dione* and *Elaphe quatuorlineata* with Susan Blisset. Donna Thornton, Melanie Page, Sharon Ralphson, Emma Gibbons, Michelle Emsley and Elizabeth Hobson are monitoring horizontal and vertical movement patterns in *Physignathus cocincinus* in the tropical enclosure. Little is known about the biology of these species, particularly the old world rat snakes.

Thermoregulation in the Leopard Gecko is the interest of Lorraine Koskinas, Tracy Brierly, Sharanjit Kaur, Kimberly Naylor, Susannah Unsworth and Tina Johnson using the model hypothesis of Hertz (1992). Previously tests for thermoregulation in reptiles involved observing whether body temperatures were higher than air temperatures. This was until Heath's (1964) experiment with filled beer cans indicated that such a criteria would lead to the conclusion that either beer cans were thermoregulating or the method could be misleading.

A new method was then developed involving regression analysis using the equation,

$$y=m+b$$

where the constants m and b are derived from plots of body temperature y against environmental temperatures x. The estimator of evidence of thermoregulation is the value of m; m=1 indicates a thermoconformer, m=0 a perfect thermoregulator. The t-distribution is used to calculate significant departures from m=1 (Huey & Slatkin, 1976).

The model hypothesis argues that reptile body temperatures will not necessarily be in agreement with some environmental temperature in the absence of thermoregulation but that a real test would be in comparing the temperature that the reptile has and what it would have if did not thermoregulate. To test this hypothesis, models resembling the animals (in our experiments they are made of modelling clay and have approximately similar mass to the real animals) are then placed in key areas and at random in the environment (the null models) and their temperatures compared with the body temperatures of the real animals.

Plate 1. The main enclosure at the Herpetological Unit is a large tropical enclosure. This photograph shows the section with a pond and overhanging tree branches used by the lizards as basking sites.

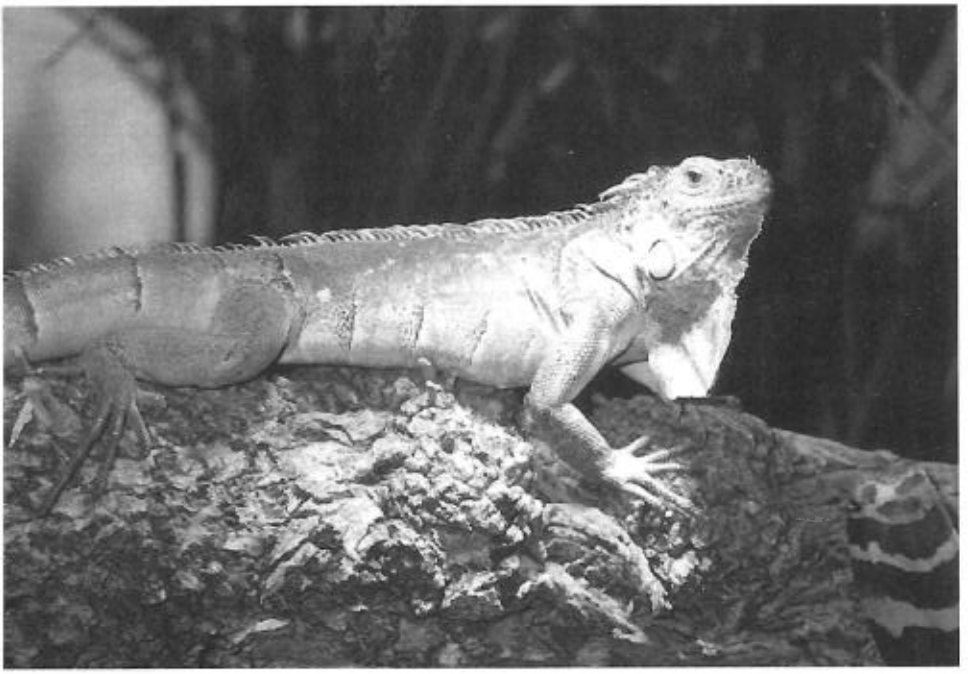

Plate 2. Green Iguanas are the conspicuous species in the tropical enclosure. Here a large female basks under a spotlamp on an overcast day.

Plate 3. Donna Thornton and Melanie Page record movement patterns in *Physignathus* in the tropical enclosure.

Plate 4. Tracey Brierly and Susannah Unsworth work on collecting thermoregulation data in Leopard Geckos.

Lindsay Davidson and Melanie Parkinson are studying basking patterns in Lacertid lizards with particular reference to differences between adults and juveniles.

Such research projects encourage students to make detailed observations enhancing their knowledge of reptiles and amphibians (Figs 3 & 4). However to increase this programme of investigative learning, ecologist Martin Dunn plans a series of ecological projects (involving amphibians) utilising the grounds surrounding the unit.

LINKS WITH INDUSTRY

Links with local industry are an important asset in the college's educational programme and students as part of their training are actively involved in this area through work placement. For example several of our students are involved in wildlife conservation on the nature reserve of the industrial giant Zeneca at their Huddersfield works. Under the direction of the Zeneca's Environment Coordinator John Avison part of this programme concerns a reptile and amphibian conservation project (mainly concerned with Slow Worms) set up jointly by John Avison and the College's herpetologist Roger Meek.

The College has Institutional Membership of the British Herpetological Society and recently the society's president Dr Roger Avery visited the college (December 1995) and gave a talk on his research to the students.

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