Marsupials: The Chilean connection

Two Monash zoologists studying marsupials in southern Chile have established the link between South American and Australian marsupials more firmly than ever. And in the course of their work, they have greatly expanded the number of specimens and the ecological understanding of three poorly known temperate zone marsupials.

It is no wonder the Indians in Southern Chile look on the small possum-like marsupial, *Dromiciops australis*, as a good spirit of the forests.

Many of these people make their winter living as woodcutters, just at the time when *Dromiciops* is likely to be hibernating inside hollow trunks. They call it monito del monte, the little monkey of the forest.

Every so often, when a tree is felled, a seemingly frozen small mammal drops out. And when the lucky woodcutter races to pick it up, the warmth of his hands magically arouses it to activity.

The Indians believe a captive *Dromiciops* will bring them wealth and good health, and are loath to part with their animals, even when the wealth arrives in the form of two Monash zoologists anxious to buy a live specimen of a marsupial which is extraordinarily difficult to trap.

*Dromiciops* has recently been put forward as the South American marsupial most closely related to its Australian counterparts, and as such is of great interest to Dr Peter Temple-Smith of the Department of Anatomy and Associate Professor Tony Lee of the Zoology Department.

Temple-Smith, who is best known for his work on male infertility, is also interested in comparative reproduction in male marsupials; more particularly, in the comparative structure of the sperm from different marsupial groups.

Lee has devoted more than twenty years to trying to determine what it means to be a marsupial. He wanted to find out whether theories developed about the life history strategies of Australian marsupials could be generalised to South American marsupials.

So while Temple-Smith and his wife Meredith (a psychologist from Melbourne University) spent four and a half months in South America from October 1985 — including a month in Patagonia attempting to collect specimens of the marsupial carnivore, *Lestodelphys halli* — Lee and David Taggart, an M.Sc. student from the Department of Anatomy, managed to join them for seven weeks in December and January.

They targeted their efforts primarily on *Dromiciops*, but also were interested in two other Chilean marsupials, *Ryncholestes raphanus*, a narrow-headed shrew-like marsupial and *Marmosa elegans*, a small mouse-like insect eater.

Almost anything they found was going to be interesting. As Lee said: "Very little is known about South American marsupials, and what is known is incomplete or superficial. They are in the position Australia was in during the 1950s."

Marsupials differ from the more commonplace placental mammals (like ourselves) in the way their young develop. Instead of growing in the womb to the point of independence, marsupials are born at a very rudimentary stage and complete their development to independence outside the mother's body in a pouch.

Almost all present day marsupials are found in Australia, New Guinea and Central and South America, but in the Americas the group occurs as far north as Canada.

Temple-Smith said: "Marsupials are good in a general comparative sense, because there is a tremendous variety of species."

Continued overleaf
Sperm structure is important evolutionarily. In marsupials, the shape of the sperm head can be used for classification. Savants can look at a sperm and tell which marsupial family it came from."

Historically, scientists have been able to sort out sperm from American and Australian marsupials on the basis of just one characteristic, sperm pairing. Sperm from American marsupials pair, head-to-head across the surface of the acrosome (a membrane bag which contains the enzymes necessary for breaking down the wall of the egg). None of the sperm pair in the more than 140 Australian species of marsupials. But Dromiciops is derived from an evolutionary line different from any of the other South American marsupials. It has a fossil history extending back 40 million years, and is the only living representative of the microtherids.

Recently, on the basis of the bone structure of the foot, Dr Fred Szalay of the City University of New York decided Dromiciops was more like the Australian pygmy possums than any American marsupial. Dr John Kirsch also set it aside from the American marsupials in terms of its protein immunology, but neither hypothesis was accepted readily.

So Temple-Smith wanted to see whether its sperm paired like those of all other American marsupials. Preliminary indications, from one imperfectly preserved specimen at Michigan State University, were that they did not.

Dromiciops is a seasonal breeder, but its ecology is so little known that in 1983, Temple-Smith arrived a month too early for the breeding season and missed out on any sperm. This time with the help of an entomologist from the Instituto Juan Molino, he spent two months trapping in the wet beech forests of southern Chile, 1000 km south of Santiago.

During that time, despite a lot of effort, the expedition managed to trap only one animal, but, using pesos as bait, they encouraged local Indians to assemble the largest known live collection of Dromiciops, 21 animals. And Temple-Smith found that the sperm do not pair.

At the same time, they caught a male and three female Ryncholestes, an animal of which, ten years ago, only five had been caught. Despite the rigors of temperature variation and travel, Temple-Smith managed to prepare some of his best ever slides of sperm tissue for scrutiny under the microscope.

The group had been told that it was impossible to keep Ryncholestes alive for more than 24 hours, but in 1983 Temple-Smith kept a male for three days and this time the group managed to keep the male for four days and several females for more than a month. During this period, the scientists could study the behavior of the marsupials and there was an opportunity to film these rare animals for Chilean and Australian television.

"Ryncholestes is a master worm getter. It has a very narrow snout with two teeth at the front coming forward and then a very long gap back to the molars, just like a kangaroo. There are flaps of skin at the back of the mouth which feed the worm through onto the molars. The front teeth appear to serve as forceps and probably are used to pull prey from crevices and then pull it apart.

Although also considered rare, Marmosa proved much easier to trap. The scientists caught it amongst boulders in an arid beachside desert, 250 km north of Santiago. Despite trapping several males, Temple-Smith was not able to get any sperm samples, because none of the males were mature, though the breeding season was past.

That was extremely interesting to Tony Lee. It was, in fact, the culmination to a very satisfying and successful trip.

"From what little we know, I had made certain predictions about the South American marsupials on the basis of theory developed in Australia. For instance, what the diet would be, based on what we knew of the life history, or what the life history would be on the basis of diet.

"Although we still need more information, the predictions pretty well held."

The first prediction was that Dromiciops, which produces several relatively small litters of about four young during the warm months of the year, would turn out to eat fruit as well as insects, just as the pygmy possum does.

"That proved to be the case. There was evidence of fruit in the diet, though the animal previously was thought to have been a strict insectivore."

"With Ryncholestes, the evidence suggested it was a good insect eater which produced one relatively large litter annually. And there was the possibility that the males only survive to breed in the first breeding season, similar to Antechinus (an Australian marsupial mouse). It even looks like Antechinus."

The group's findings appear to support that possibility. The one male obtained was caught just before breeding, and only females were caught after that time. Others have been able to catch only adult females and young in late summer after the breeding season.

"Marmosa is also an insectivore, but this time living in the semi-arid. I suspected it spread its reproduction to produce perhaps two litters over a prolonged breeding season in much the same way as the dunnarts in semi-arid Australia. Again, it even looks like the dunnarts (Sminthopsis). We need more information to confirm this prediction, but we've set up a couple of locals to obtain this."

Lee said the next step would be to analyse the diets of the animals from material he has collected, and then to draw together all the information to be found on their life histories.

"The most frustrating thing was that two of the species did not respond to the trapping procedures we have exploited in Australia. I'd like to go back now and have a look at some of the Argentinean marsupials."

-- Associate Professor Tony Lee and Australian friends.
Predicting machine failure by phone

A MONASH RESEARCH team has developed an automatic monitoring system which can be used to predict when industrial machinery is likely to break down.

The team, headed by Mr Bruce Kuhnell, a senior lecturer in Mechanical Engineering, has built the system to monitor the deterioration of machine bearings. It eliminates the need to gather data by hand, with a potential saving to industry of hundreds of thousands of dollars.

Kuhnell said the new system could allow industry to plan more cost effective programs of preventative maintenance for machinery ranging from mining and smelting equipment through to railway stock and motor cars.

It has taken three years to develop the equipment. "The idea grew when I was doing a job which required monitoring 64 bearings at the one time. We needed something that was easy to use, cheap, and fairly automatic," Kuhnell said.

He, himself, built the 64 monitoring sensors (instruments which measure the amount a bearing vibrates). "The present cost of each one is about $500, but I made these for around $40 each."

"Up till now, readings have been taken at regular intervals with hand-held sensors and then analysed back in the laboratory." Another method has been to attach sensors to the machinery temporarily. The new system allows sensors to be permanently clamped to the bearings for continuous assessment.

Each of these sensors is linked through an interface, called an acquisition multiplexer, to a single computer storage system capable of handling simultaneously the 64 vibration signals from the sensors.

"Some computer programs were available for data interpretation, but they couldn't store all the signals, so we built a 16 channel interface."

To interpret all 64 sensor readings, they needed four such interfaces. "Each of the 16 channels on an interface cost $200 to build. This is compared to between $1000 and $2000 to buy commercially," Kuhnell said.

The raw vibration signals are sent from the interface along telephone wires to the computer. Here, old and new data is compared to determine how much each bearing has worn.

Incoming signals are processed on a computer to produce a graph of the vibrations of each bearing, known as a frequency spectrum. The computer retains three spectra: the original; the most recent; and the spectrum presently being tested.

Vibration readings differ depending on the extent to which the bearings are worn. It is the change detectable in the frequency spectra which gives the engineer a clue to the amount of wear left in the bearings. "The system gives automatic reports of bearing wear, but ultimately, the computer operator must make the analysis decisions," Kuhnell said.

A great advantage of the system is that the control area, which houses the analysing computer, does not need to be near the machinery being tested. It can be anywhere as long as it can be reached by telephone.

"The problem with machine maintenance is that it is essential to know when a breakdown will occur in advance, otherwise major structural damage and large financial loss could result. This system even makes it possible to monitor machines which could not be monitored manually," Kuhnell said.

"One such machine is a continuous casting machine which has a large chute carrying molten steel. The steel solidifies as it passes through the chute. It is then supported by 240 manually inaccessible bearings. If one bearing were to break, it would cost the company hundreds of thousands of dollars daily in production loss."

To avoid the possibility of injury, bearings in some equipment, such as railway carriage wheels, have had to be replaced regularly, whether they needed it or not. There was always the fear that a derailment could occur if the bearings failed.

Kuhnell believes the system could be used to predict accurately when such bearings are likely to fail, allowing them to be replaced only when necessary.

"The system should be used as an early warning device to change bearings before they fail, and not as a 100 percent accurate prediction process."

The oil additive company, Molybond Australia, has sponsored the research.

— LIZ RIVERS

MONASH REVIEW

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October 1986
University profits from computer links

Researchers at the university's Computer Centre have devised an inexpensive and efficient system of linking computers into a network. Widely sold in Australia by Racal Electronics, the MONET system now is being assessed for markets overseas.

A SYSTEM DEVELOPED at the university's Computer Centre, which allows people access to a number of computers and printers via a single connection, soon might be marketed overseas.

The MONET computer network system, manufactured and sold in Australia by the data communications company, Racal Electronics Pty Ltd, at present is being evaluated by company divisions in the US, the UK and New Zealand.

In Australia, the system already is used by Telecom Research Laboratories, Telecom Australia in New South Wales, and Mitsui Mines. It also recently has been installed by a large Federal Government department.

The marketing manager of Racal, Mr. Bob Hammond, said the company expected sales to double this year to about $3 million. Racal already has paid Monash more than $200,000 in royalties.

Hammond said MONET's greatest advantage was that it was considerably cheaper than anything of comparable performance. Connection to MONET costs between $200 and $300 a communication port (a link through which information enters or leaves a device) compared to about $1500 for the next cheapest available system. The devaluation of the Australian dollar makes MONET even more attractive.

A team of researchers led by the director of the Computer Centre, Dr. Cliff Bellamy, began developing MONET in 1977. The group had become convinced that the most cost effective computing for the university in the foreseeable future would be provided by linked minicomputers, rather than a single large machine.

So it set about designing the system needed to link a variety of minicomputers with many different kinds of terminals and printers. "We saw an opportunity of bringing money into the university," Bellamy said.

The system they came up with, MONET, replaces the need for individual radial wiring from a main computer to each connected terminal. Instead, each computer, printer or terminal is connected to one of a series of duplicated communication "buses" or wiring routes.

Each bus has several "nodes" or micro-processor-controlled connection points along it, and each of these can have up to 48 terminals attached.

What this means is that even though MONET demands substantially less cable than a radial system, it is much more reliable. If a bus fails, it can be taken out of the system without disruption to terminal users—the affected terminals are switched automatically to an alternative bus. In addition, bus cables can be extended and re-routed without causing any interruption to service.

MONET also can be expanded almost indefinitely, and, because it is compatible with most modern communications equipment, can use the telephone system to connect devices remote from each other.

At present the original Monash system consists of 60 network nodes which service more than 2300 connections: about 150 computer terminals, about 100 printers, and more than 600 links with minicomputers. Many of these devices are not on the Clayton campus, but in the Monash University teaching hospitals nearer the centre of the city.

Bellamy said: "We believe it is one of the few networks where devices are addressed by name. That means that if a device moves physically the network still recognises and delivers communications to it."

MONET also has an inbuilt security system which controls access by different devices. For instance, certain computers can...
Bellamy said: "Imagine a mob of people all wishing to communicate. Each must listen. If two attempt to speak at the same time there is a data collision and each stops, backs off and waits for someone else to go." One computer maintenance contract. In Australia, Monet has achieved $1.5 million sales in its first year (at around $200 per port). And it's about to take the overseas markets by storm. Australia has worldwide rights for manufacture and distribution of Monet. Bellamy said: "It gives customers what they want. Already in Australia, Monet has one computer maintenance contract. In the US were interested in digital communications systems." Bellamy also firmly believes that you can only keep technically competent staff by offering them a challenge. "When I started here in 1963, you couldn't hire people with much experience of computers. Since then we've tackled a variety of projects which seemed worthwhile, partly to help develop the Computer Centre and partly to learn. "For instance, we set up the Health Computer Services for the Health Commission, and we developed an educational computing system, MONECS, for which we sold $350,000 of software. "Most other institutions don't do their own computer maintenance. We have not one computer maintenance contract. In fact, we are just extending the memory on our VAX computers. It's costing us $25,000 to extend the memory to a level for which the DEC company wanted $500,000."
Ancient language aids in study of modern warfare

A MONASH RESEARCHER is gaining insight into modern warfare by learning an ancient language.

Dr Nick Sekunda, a post-doctoral fellow working in the Department of Classical Studies, is studying Old Persian to learn more about the structure of the armies of Alexander the Great. And Alexander's armies and tactics from the Fourth Century BC are still a very influential model today.

Already Sekunda's studies have been rewarded. From Old Persian source words he has been able to decipher information about six regimental components on the Macedonian army, and he also has identified several previously unknown Persians from the Greek histories of the day.

He said: "All the great generals of world history have studied the campaigns of Alexander with profit, indeed much modern military thinking is derived directly or indirectly from a study of Alexander's methods of warfare.

"So a detailed study of the means he had at his disposal, his army, is useful not only for a better understanding of ancient history, but also for a deeper understanding of the premises upon which military decisions are taken in modern times. Such a study has never been attempted before."

Sekunda is being taught Old Persian by Dr Robert Slonek, a linguist from the Department of Slavic Languages, and one of the few Australian scholars of ancient Indo-European languages, which include Old Persian, Sanskrit and Indo-European itself. Monash is the only university in Australia offering such courses, and Sekunda had difficulty in finding anyone to teach him in his native Britain.

He said that from his research it had become increasingly clear to him that the reforms Alexander and his father Philip II had introduced into their Macedonian army were mainly ideas borrowed from Greece and Persia.

"Consequently, for the last few years, I have been directing my researches not only into ancient Greek warfare, but also into the military and political organisation of the Persian Empire, a sort of Austro-Hungarian Empire of antiquity."

Nick Sekunda says he has always been interested in warfare, particularly ancient warfare. "My mother says I was playing with toy soldiers from the age of four, and I was an officer in the (British) army reserve for nine years."

After completing a PhD on Cretan mercenary archers at Manchester University in 1980, Sekunda got a job as a computer programmer with the giant British chemist chain, Boots. But after three years, "my love of antiquity turned out to be far greater than my love of wealth."

So, living on the money he had saved, grants from research institutes and the royalties from a popular book on Alexander the Great's army, he plunged himself into research again.

When the Thatcher Government began to divert almost all research money into applied projects, he began to look overseas, and was delighted when he secured a post-doctoral fellowship at Monash to work with Dr Jack Ellis, whose book on Philip II he considers "the best on Macedonian imperialism and very important to the understanding of the bases of warfare.

"You can imagine my further delight on arrival, to find that I had landed in the only university in Australia where it was possible for me to learn Old Persian. I had frequently heard Dr Slonek mentioned in Manchester, and knew he was based somewhere in Australia, but I had no idea that he was at Monash."

Most of the information on the Persian Empire comes from Greek historical sources. The Persian emperors, however, also had a series of inscriptions carved on the vertical faces of the Iranian mountains in the ancient languages of Akkadian, Elamite and Old Persian itself. In fact, all that exists in Old Persian comes from 83 inscriptions, which means the grammar and vocabulary are incomplete.

A further complication is the script. Old Persian is an example of a language written in a script developed for a completely different language, just as Maltese, an Arab language, has been rendered in Latin script. The cuneiform script (where syllables are represented by patterns of wedge shapes) is ill-suited to reproducing Old Persian and makes transcription difficult and uncertain.

"That means any attempt to master Old Persian would be an almost impossible feat without adequate supervision and guidance," Sekunda said.

Alexander the Great's army is the best known of all the ancient armies. "It's the only one where you get four different authors describing the campaigns in detail. And it

* The tomb of the ancient Persian emperor, Darius. His deeds are inscribed in Old Persian.
coincides with some of the best preserved archaeological remains from antiquity. There are even Persian regimental uniforms contained in Greek and Iranian works of art of the period.

Sekunda said the Greek writers who had close connections with the Persians often used to throw in Persian words (rendered in Greek) just to show they knew what they were talking about. "If you know Old Persian and its grammar you can reconstruct what the word was and work out more about its precise nature."

For instance, in Greek accounts of the Battle of Issus, the first great encounter with the Persians, the word "kardakes" crops up. It is not a word of Greek origin and is used to mean barbarian hoplites. (Greek hoplites were heavily armored infantry with bronze shields, hence expensive to arm and not used previously outside Greece.)

"Kardakes" appears to be a transliteration of the Old Persian "kartaka", the first syllable of which means "made" or, more likely, "trained". This was an era of great reorganisation in the Persian armies, and it now appears from this work, Sekunda says, that part of this process involved the introduction of men trained as Greek-style hoplites. Before this the Persians relied on lightly-armed infantry.

Sekunda came to Australia with hopes of identifying perhaps three Persian regimental titles. In four months with the help of Slonek, he already has clarified six types of regiments and their uniforms and armaments, and in addition has picked out the names of several Persian commanders.

"Next, I'm hoping to learn Sanskrit," he said.
Nerve test for diabetics could improve treatment

Research into prickly and itch has led to a sensitive, new, non-invasive test for nerve damage. Although it has only just begun to be assessed, it could mean better treatment for diabetics.

A research team in the Department of Physiology has developed a non-invasive test for fine nerve damage which could lead to better treatment for diabetics.

The group, led by Associate Professor Rod Westerman, so far has tested more than 20 patients of the Lion's-International Diabetes Institute at the Royal Southern Memorial Hospital. In all cases the results have agreed with presently available tests, which only monitor damage to the largest fibres.

The novel technique does not involve penetrating the skin, seems more sensitive and efficient, and gives new and useful information.

It monitors changes in flow in the small blood vessels just under the skin in response to electrical stimulation of nearby thin, unsheathed nerves.

The rationale is that the detected changes in blood flow are directly related to the ability of the thin nerves fibres to respond to the stimulus, hence how healthy the nerves are.

Nerve deterioration is one of the symptoms of diabetes and the test can be used to monitor progress of that condition and its treatment.

The thin 'polymodal' nerve fibres are responsible for sensing and responding to heat, and strong mechanical and chemical stimuli. So damage to them can lead directly to reduced sensory and healing capacity, and a lessening of ability to fight bacterial and chemical invasion through the skin, hence to complications such as skin ulcers and gangrene.

The new test arose from research into prick and itch which Westerman's group was undertaking for the Australian Wool Institute. This required the team to look at the neural mechanisms underlying unpleasant sensations caused by coarse fabric, which led to an examination of the wider role of the thin nerve fibres in causing a general inflammatory response.

"We thought it was time to re-examine the inflammatory response using more modern techniques and equipment," Westerman said.

The original work on the inflammatory response — for example, the reaction to mosquito bites and nettle stings — was carried out by Sir Thomas Lewis in the 1920s.

He described a three-tiered response, a sensation of itching or pain, a widespread area of reddening or flare and a central swelling or weal. Although he measured a few characteristics of the response, such as the area covered by the flare, his study was mainly descriptive.

Lewis explained the response as a local defence reaction. In more modern terms, a physical, chemical or heat irritant stimulates one of the sensory nerves just under the skin. Even before that nerve's transmission reaches the brain, it has released a chemical transmitter substance at its local nerve endings which stimulates other thin nerves in the neighborhood, and so the response spreads like a net.

The transmitter substance also affects specialised storage cells known as the cutaneous mast cells which release compounds like the anti-clotting agent heparin, histamine and enzymes called proteases which can break down proteins of invaders. And the action of gently rubbing the skin — scratching the itch — helps to break down more mast cells.

These substances act on the nearby nerves and blood vessels, as well as stimulating other mast cells. In particular, the blood vessels dilate which increases the flow of blood to the area, and causes the red flare.

Finally, the fine blood vessels open up releasing plasma containing another lot of proteases, but more importantly the body's primary defence mechanism of immunological proteins (antibodies) and the white blood cells. It is the build up of plasma leaking into the tissues under the skin which forms the lump.

The same inflammatory response makes the air passages of the lung constrict to cause asthma, makes noses run, and eyes red and itchy. So any further investigation of the mechanism had great potential importance.

"To determine the importance of the inflammatory response as a defence mechanism, we wanted to look at a deficient system. We wanted to see if nerve degeneration led to the destruction or abolition of the response. So we decided to look at disease models which damage the thin nerve fibres in the skin, and diabetes was a good example," Westerman said.

As well as looking at diabetic patients, the group has done a parallel series of studies using chemically-induced diabetic rats where they could control the intensity and duration of diabetes.

And, in order to measure or quantify the response, the team began using a laser Doppler flowmeter to measure skin blood flow. This machine has a fibre optic probe which consists of a thin laser beam and two detectors. The laser light shines onto the skin and is reflected by red blood cells moving in the smallest blood vessels just under the skin.

But the quality of light is affected by the speed of movement and number of red blood cells. It comes back apparently a slightly different color — just how different depending on the velocity of the cells. The two detectors measure that change and the machine automatically calculates what it means in terms of blood flow.

(The same physical principle leads rail passengers to hear an apparent lowering in the pitch of level crossing bells as their train rushes past.)

Starting in rats, the group has been measuring the changes in blood flow in response to electrical stimulation which...
varies between a tiny prick and a sharp local sting. What it has found is that, as the rats become more diabetic, skin blood flow response for the same stimulation drops to about one tenth what it is in an unaffected rat.

And the same seems to be true of the humans tested so far. The responses of normal and diabetic people are so different, that they appear to allow for the detection of an intermediate group of diabetics who are "at risk" of suffering thin nerve damage because of their disease.

This, then, is good evidence that better control of their diabetes is needed. Such patients also can be checked to see if their larger blood vessels are deteriorating, and they can be advised to take meticulous care to avoid any form of skin damage.

Westerman said that in the past such testing had been "time consuming, cumbersome and relatively crude". It relied on determining when heat became painful to a patient, thereby actually measuring the threshold of transmission of that message to the brain.

With the laser Doppler flowmeter a patient can be tested in about half an hour using a couple of probes rested on the skin. The information gained is more meaningful and relates directly to the protective function of the skin.

The system also will be useful for further research, allowing a means of assessing the effect of treatment or experimental drugs.

No one yet knows the precise way in which diabetes - a condition whereby the body is unable to use glucose for energy - leads to nerve deterioration. It is thought, however, that increased sugars in the blood upset the chemical balance around nerve membranes, thereby impairing nerve function.

One compound which appears to alleviate the impact of diabetes on nerves is the drug Sorbinil. Using the new test, Westerman's team already has shown some recovery of nerve function in rats treated with Sorbinil. The drug at present is being tested on patients at several centres in the US.

The research team plans to continue close collaboration with Associate Professor Paul Zimet and the Lion's-International Diabetes Institute as well as with the Monash Department of Pharmacology.

*The flare or reddening of the inflammatory response.*

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October 1986
New course brings history to life

Aboriginal land claims, museums, building conservation and tourism all are demanding a new type of historian who can do more than pore over old diaries in libraries.

There is work for practical historians — and the beginnings of an entirely new sub-discipline known as public history.

In recognition of this, in 1984 the Department of History introduced an innovative course for undergraduate honors students called History in the Field. It has been such a success that recently the department advertised a new lectureship in Australian history to expand and broaden the undergraduate course and develop a new graduate course in the area.

History in the Field introduces students to the uses of history in the community and teaches some of the techniques needed to research such “applied” history.

And, as part of the course, students also undertake a community history project working with a practising historian.

History Department chairman, Professor Graeme Davison, said: “The tradition in academic history is that it is taught primarily through print. In this course we are looking at landscape, buildings and artefacts, as well as using oral history.”

Honors student Sheryl Yelland said: “It’s a new way of looking at history. You don’t have to have written sources. The very layout of a room in a house tells you something about the way people lived.

“The State Government now is very interested in tourism and conservation. People like history. When they are presented with visual material and even ruined buildings, it brings things to life.

“Applied historians are looking at all kinds of evidence. They are using their imaginations and good historical interpretation to help people meet history halfway. It makes them very employable.”

The present course begins with what Davison calls a “tooling up phase”, using guest speakers, tutorials and seminars to introduce students to the different perspectives and methods of applied history.

This year the class also spent time at Creswick in the central goldfields putting what they were learning into practice, making a historical assessment and appraisal for the future use of old mining sites for the Department of Conservation, Forests and Lands. Students traipsed around the area in the cold and rain with old maps and the latest army ordinance maps locating old mine sites — deep leads, Chinese workings, unusual cuts.

The second half of the year-long course is taken up with projects. Sheryl Yelland is working with consultant historian Chris McConville on soldier settlement in the Shire of Bet Bet, southwest of Bendigo.

Much of her time is spent combing records in Melbourne — Parliamentary reports on what estates were bought, archival copies of the local papers for information about to whom the land was allotted, parish maps, public records.

“Then we go to the field and drive round and round looking for the allotments and any fabric that remains or other material we can find. We also try to locate on aerial photographs the scars left by the houses. It’s quite hard work.

“You can read all the sources about soldier settlers, and their 20-acre blocks on which they had to plant orchards. But you only get a real feeling from standing on the site — how small the houses were, for instance.”

Other student projects have included developing educational programs on immigration to Victoria in the 1850s for school visits to the Polly Woodside, carrying out an urban conservation study of the Auburn Shopping Centre for the Ministry of Planning and the Environment, and designing a new historical display for the Queenscliff Military College Museum.

Davison said the course grew out of his involvement with the Historic Buildings Council, of which he is chairman. “It caused me to think about the relationship between outside work and academic scholarship”.

So far, he deliberately has kept the course very small. This year’s quota was five. “Its success depended so heavily on contacts with external organisations, that I was concerned to develop relations with them very carefully.”

Reaction to the course has been very encouraging. There have been many favorable reports on the quality of the students. And despite a heavy workload, demand from students has been high.
Australia gets serious about battered children

A MONASH ACADEMIC has published the first overview of how Australia copes with child abuse.

In a publication entitled, "The systems for managing child maltreatment in Australia", Professor Peter Boss of Social Work has described the six state systems, providing a basis for future comparisons.

He said his study was stimulated by the difficulties which arose when he and a group of colleagues began to discuss the reforms to child welfare legislation in Victoria proposed by the Child Welfare Review Committee chaired by Dr Terry Carney of Law.

The study brings together information on child abuse legislation, definition, notification, investigation, personnel and training, and involvement of agencies and other bodies.

Although the research scrupulously avoids drawing comparisons, Boss said it was quite clear that Australia now had come to treat child protection seriously.

"Each of the states now has a recognisable, identifiable system for dealing with child abuse which can be described. Ten years ago, you couldn't have said that."

"Ten years ago, the Minister for Health in New South Wales was reported as saying, on being challenged as to why the state didn't have a system which tackled child abuse. 'We don't have child abuse in New South Wales, so we don't need the services.' Now New South Wales on paper has a comprehensive and logical system for managing child abuse."

Professor Boss said he did not think Victoria would come out very well from any comparison. It is one of only two states in which reporting of child abuse cases by health professionals is voluntary.

But of greater concern to Boss is the State's avowed policy of "dual track" management of child abuse cases, with responsibility shared between the Department of Community Services and the police.

"This is out of step with all other states except Western Australia. There's not even any provision for passing on information between the two."

"Victoria is very much geared to prevention, but not good at coercion. It's as if Community Services don't want to soil their hands, so they've sloughed off intervention in child abuse cases to the police."

Boss is particularly worried because of evidence from a recent study in the UK, that the circumstances leading to the most serious cases of child abuse almost always were known to the authorities, but there was no intervention because no-one would take responsibility.

The level of child abuse in the US, which has had compulsory reporting for many years, runs at about one child in 100 a year. Reports of child abuse seem to have risen sharply in Australia in the past few years, but the figures are difficult to interpret, because of the introduction of mandatory reporting and growing awareness of the problem.

Boss thinks the reported level of child abuse will continue to rise, but the rate of increase will slow down and eventually level out. "In a few years, with infusion of resources into the area, I hope we will see a reduction in notified incidence."

Speaking of the causes of child abuse, he said there was convincing evidence that child abuse correlated with poverty and associated problems such as social isolation, geographic mobility and, particularly, unemployment. "There's no doubt that working class kids tend to get thumped, but no one economic or social or situational cause stands out as being more important than the others."

One oft-cited cause he does not support is the hypothesis that it is children who were abused that grow up to be abusers. "I've almost given up on that one. There is no reliable evidence to bear that out. The childhood recollections of child abusers cannot be trusted. They are often used as an excuse or a rationalisation."

Boss has more than a passing interest in further work in the area. He is retiring from Monash at the end of the year to become part-time director of the Children's Bureau of Australia.

• The victims of child abuse: "Victoria is geared to prevention, but not good at coercion."
Giving lawyers a sporting chance

Australians seem to treat sport as an escapist pursuit, divorced from serious study. But sport is an expression of society, worthy of study by historians and sociologists as a very important and significant indicator of social trends. There's also been a lot of fine work done in the areas of sports medicine and economics.

Many respectable disciplines include sport in their curricula. It's now opportune for law to do the same.

Sport is becoming big business with tax and anti-trust implications. It's a very important subject in human terms, very important for the condition of society because of its enormous impact on children and the mental and physical health of the nation.

There is a big literature on sports law in North America. It's an academically respectable subject. A recent case to do with baseball league exemptions, for instance, went to the US Supreme Court and was very much a national issue.

But there is still prejudice against the subject amongst Australian legal academics. Many think it's a Mickey Mouse topic.

In the past five years, Monash has held two very successful seminars on sports law. To my knowledge, there is little else being done at any other law school in Australia. I would like to see sports law developed at Monash as a subject in the L.L.M. program, or as an optional subject in the undergraduate program.

I have always naturally gravitated towards the sports pages of any newspaper. But these days there's more law there than in any other part of the paper.

It's a fallacy to think that law doesn't have anything to do with sport. The law always has. From my preliminary research there were just as many legal issues in the 1930s as there are now — zoning restrictions, Don Bradman writing for the Press, assault charges.

But only in the last few years have lawyers been consulted. Before this, these problems were solved without recourse to the legal process.

I think the participation of lawyers is a healthy trend. It is not to be feared or deplored. Disciplinary committees, for instance, are taking much more care nowadays.

The Leigh Matthews case (where a respected former captain of a league football team was convicted on assault charges for an incident that happened behind the play) produced a salutary decision. It's very good for the community, and a good example to kids, to know that you can't do this sort of thing with impunity.

Under the legal principle of volunti non fit injuria, sportsmen do consent to a certain use of force in keeping with the rules, but they don't consent to a flagrant breach of the rules. A sportsman may have a wife and children to support, and is entitled to be protected from illegal actions which might incapacitate him.

Being a professional sportsperson demands a great deal of skill, talent, and dedication, and they should be rewarded for it. It's their livelihood and legal contracts are essential to protect their interests. But they should always contact a lawyer in advance of signing a contract — if they go in without legal advice, they're going in naked.

Another area of legal interest is the question of planning appeals. You've got to have somebody to adjudicate over questions like whether the local tennis club should be allowed to erect floodlights or not.

Then there are the clubs themselves where people are handling money, and in positions of trust. Questions of incorporation and insurance cover are most important here.

And there are also questions of the safety of grounds and sports stadia. In England, since the Bradford fire, they have passed very stringent legislation.

The issue of crowd violence and protection of citizens also is important. I can't see any argument that the law should be taken out of these areas.

Another growing legal area is that of libel and slander, what can and can't be said against fellow sportspeople. I think that area is very, very tricky, but I don't think sportspeople should be squeamish about criticism whenever they perform at less than their best.

Eligibility is a source of great difficulty unique to sport. It's a problem of administrative law to a point. Administrative law becomes relevant whenever some non-court body sets itself up as an arbiter of someone's rights. For instance, in the case of the Olympic Games, you have an international body purporting to decide whether athletes are women or men, amateur or professional, drugged or not.

There are legal issues in the draftsmanship of the rules of the games and the conventions. Commenting on a recent transfer case involving the Victorian Football League the presiding judge said that considering the amount of money generated by the league, its rules of administration were so badly drafted as to be incomprehensible.

I don't think you could teach sports law unless you had some feeling and attraction for sport itself. It can't be seen as a traditional business, because of the peculiar nature of the sporting contest. You cannot hold it to the same degree of regulation as you can, say, driving a motor car.

There is a very great advantage in sports law as a discipline of law. In Australia, most areas of law are taught very artificially. The cases which are used as examples are contained in the law reports, and are the exceptional cases which reach the Supreme Court. Hence students get a completely false idea of what is involved in day to day law.

But with sports law, a fantastic amount of material is reported in the daily newspapers. It would make excellent teaching material about how the law works at the grass roots level.

Mr Neville Turner, senior lecturer in Law, has always been a sports fan, but it was only when he had to review a book ten years ago that it occurred to him that sports law was a subject worthy of serious study. In 1978 while on overseas study leave, he organised the first conference on sports law to be held in Britain. Here he argues that, with the growing professionalism of sport, Australian law schools should follow the North American example and begin to teach sports law.

• American football: a multi-million dollar business riven with legal implications.