# Camelid Research in Peru

*By Jane C. Wheeler, Ph.D.*

**Conducting high quality scientific research is always a difficult undertaking in the best of circumstances and although the possibility of doing research in Peru might at first consideration appear impossible, it is not. Thanks to the creation of a model camelid farm at La Raya, Cusco in 1950, much basic research on alpacas was carried out by professors associated with what is today San Marcos University's Veterinary Institute for Tropical and High Altitude Research, IVITA. Among the early IVITA publications are the first scientific reports on alpaca reproductive physiology, infectious diseases, parasitology and nutrition, to name but a few. An active alpaca research programme was maintained both at San Marcos's Faculty of Veterinary Medicine in Lima, and the IVITA research center at La Raya with support from the Rockefeller Foundation and FAO through the 1970's and, although largely attenuated by the political and social upheavals of the 1980's and early 1990's, the tradition remains very much alive and is actually undergoing a renaissance.**

*MACS project: Recording weight of vicuña, Vicugna vicugna mensalis, at chaccu held at Catac, Ancash.*

Thanks to a Senior Fulbright-Hays Fellowship at San Marcos University in the 1970's my research focus shifted from sheep and goats in the Middle East to South American camelids in the Andes. With degrees in Anthropology, and a specialization in archaeozoology, the study of animals in ancient societies, the connection with the Faculty of Veterinary Medicine and IVITA was natural. A trip to La Raya, with its research facilities, experienced staff and extensive alpaca herds eventually led to years of collaborative research on topics ranging from determination of bone fusion and dental eruption rates to the study of ancient and modern herding practices. Over the years while working at other institutions on the origin, evolution and domestication of the South American Camelids; molecular genetics; breeding and fibre production; as well as vicuña and guanaco conservation, my ties with San Marcos have remained strong and the Faculty of Veterinary Medicine continues to be a source of inspiration and research base.

In Peru the situation of both the wild and domestic South American camelids and the native Andean herders is precarious. Not surprisingly, patterns of genetic variability among the fragmented vicuña population record the impact of near extinction and a subsequent genetic bottleneck. The high elevation guanaco subspecies is both virtually unknown to science and highly endangered in Peru, where just over 3,000 animals survive today. Recent genetic research has demonstrated that the domestic alpaca and llama descend from the vicuña and guanaco respectively, and have suffered from such extensive hybridization that fewer than 10% of alpacas and 60% of llamas remain pure. Intentional cross breeding, to obtain greater fiber weight and hence increased

*At left: Reconstruction of life at Telarmachay Rockshelter ca. 4,500 B.C. showing the ongoing process of vicuña domestication. From Préhistoire des hautes Andes : de la chasse à l'élevage. Pour la Science, Edition Francaise de Scientific American 88:12-21.*

*Darwin Initiative, GUANACO 1 project, Lama guanicoe cacsilensis at Reserva Nacional Calipuy, La Libertad.*

economic gain, has been general practice during the last quarter century. As the result, fiber quality continues to decrease, threatening the livelihood of native herders, as well as survival of the pure alpaca. The short term economic gains obtained through hybridization, in combination with other social, political and economic realities, have produced a crisis of major proportions that effects everyone involved. Finding a solution to these problems will not be simple and obviously will require much more than just helping the herders out. A central, underlying cause is the devastating loss, during the Spanish conquest, of ancestral knowledge about conservation, management and breeding of all four South American camelids, knowledge which can only be recovered through solid interdisciplinary scientific research.

Starting with the study of more than one ton of animal bones excavated at Telarmachay Rockshelter in the central Peruvian Andes, where evidence of alpaca origins from domestication of the vicuña 6 to 7,000 years ago was preserved, through the study of 1,300 year old alpaca and llama mummies from the site of El Yaral in Moquegua which documented the existence of highly selected breeds prior to the Inca empire, my research has progressed from simply studying the past to trying to recover the magnificent quality of the animals which existed prior to the Spanish conquest – from bones, to mummies to molecular genetics and more. In the process, CONOPA, an independent Peruvian institution, primarily dedicated to scientific research and development of the South American camelid sector was established in 2001.

CONOPA is the name given by traditional Andean herders to small carved stone figurines which represent both the domestic and wild South American camelids. Most conopas have a small depression on their backs, which according to legend, represents the lakes of the high Andean grasslands through which alpacas came into our world on loan from the mountain gods, and through which they will return if humankind does not take good care of them. Others represent vicuñas and guanacos, animals which belong to the mountain gods. Although manufactured up to the present, conopas are of prehistoric origin and continue to be used during ceremonies carried out in order to insure the wellbeing and multiplication of vicuña, guanaco, alpaca and llama herds. As such, conopas symbolize world of Andean herders, their beliefs, their practices and the South American camelids upon which they depend. It is in this holistic sense that we chose the name CONOPA and the phrase "cuidando los rebaños de los Apus" or "taking care of the mountain god's herds", for our institution. Our primary goal is to utilize scientific research and education to preserve biodiversity and the environment, while respecting and learning from past and present native cultures, in order to improve the well being of traditional Andean herders.

CONOPA is composed of camelid specialists who have many years of research experience, and extensive publication records. Raul Rosadio, the president, is a veterinarian who holds a M.Sc. in Veterinary Virology from

*Sampling alpaca herd for DNA purity testing, Canchis Province, Cusco.*

Washington State University and a Ph.D. in Experimental Veterinary Pathology from Colorado State University. Jane C. Wheeler, the vice president, holds degrees in Anthropology and Archaeology from American University, Cambridge University and the University of Michigan. Hermelinda Rivera, the secretary, is a veterinarian who has completed post graduate training in diagnosis of viral diseases at South Dakota State University. Domingo Hoces, treasurer, is a biologist with post graduate training at Peru's National Agrarian University La Molina, and one of the foremost specialists in vicuña and guanaco conservation and management.

*Jane C. Wheeler studying 1,300 year old llama mummy from the site of El Yaral, Moquegua, Peru.*

At present, CONOPA is participating in research projects on alpaca genetics, sustainable utilization of the vicuña and guanaco, and guanaco conservation and population genetics in Peru. The first project is financed by INCAGRO, Peru, and has involved evaluation of the alpaca population of Canchis Province, Cusco, to determine the incidence of non-hybridized, genetically pure animals and the relationship of purity to fibre quality. The second project is MACS, Sustainable Management of Wild South American Camelids funded by the European Community. CONOPA is the Peruvian partner in a major undertaking headed by the Macaulay Land Use Research Institute in Aberdeen, Scotland, and composed of Euroean (Giessen University, University of Norway, Valencia University) and South American (Catholic University Chile; Lujan University, Argentina; and CONOPA, Peru) partners. Our role in this project is to conduct research on vicuña genetic variability and conservation in the Andes. The third project is financed by the Darwin Initiative of Great Britain and carried out jointly with the University of Cardiff, Wales. This project is a carryon of a previous Darwin project on vicuña genetics, but this time dealing with Peru's highly endangered guanaco population. As with the previous Darwin project, it is being carried out in collaboration with Dr. Michael W. Bruford. Dr. Ciara Dodd of Cardiff University holds the postdoctoral post and Jorge Rodriguez and Katherine Yaya (CONOPA) will have received extensive training both at Cardiff and in Peru before completion of the project. This month has seen the beginning of a new project designed to establish DNA parentage testing for Peru's alpaca registry under a grant to the Peruvian Nuclear Energy Institute, Cayetano Heredia University and CONOPA from the International Atomic Energy Agency in Vienna.

CONOPA is also is actively involved in research in areas other than molecular genetics. Among the projects in animal health are studies of vicuña reared in captivity (Veronica Risco, CONOPA, and Luis Miguel Ortega Mora, Universidad Complutense de Madrid), enterotoxemia vaccine development (Raul Rosadio and Katherine Yaya, CONOPA), alpaca nutrition and fibre growth (Juan Olazabal, CONOPA, and Felipe San Martin, Faculty of Veterinary Medicine, UNMSM) and accelerated reproduction in alpacas, (Rosa Davalos, CONOPA). Work also continues on the study of prehispanic camelids (Jane C. Wheeler, CONOPA) and the preparation of a primary school text book on the South American camelids is underway.

In future issues of CQ, Jane C. Wheeler will be writing about the different research areas described above. Although not a registered US nonprofit organization, contributions to the research efforts of CONOPA are gratefully received.

**CQ**

### *About the Author*

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***Guanaco 1 project logo***

***Darwin Initiative logo, financers of the Guanaco 1 project***

***Cardiff University logo, identifying an institutional participant in the Guanaco 1 project***

***CONOPA logo, identifying an institutional participant in the Guanaco 1 project***

***Incagro logo, identifying an organization which financed the research on genetic purity of the alpaca population in Canchis Province, Cusco***

***Logo of MACS, EU financed project on Sustainable Management of Wild Camelids. See www.macs.puc.edu.cl***