

COSTA RICA – A RIOT OF BIODIVERSITY AND COMPLEXITY

A Base for Interpreting the Past

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Being a palaeontologist, my research was about long dead things. So, as a graduate student at Columbia University in the late 1960's and working on the past history of birds on the continent of Australia, I decided that I needed a better understanding of the modern world. I became aware of the course given by the OTS in Costa Rica, which looked into the way life works in the modern world and decided to apply. Being a palaeontologist, and not a modern biologist, I thought my chances of success were low – but perhaps it was my different background than most of the applicants that gave me some luck – and I was part of the 1970 student group to visit Costa Rica as a part of the OTS course.



The volcanoes in this region are still very active, because Costa Rica lies along an active tectonic boundary. For a geologist this is heaven! One of our teachers for the OTS course was a geologist. He and I and a couple of others were able to visit some of these “works of art” – some of which were still steaming, but fortunately for us none exploded. It was absolutely brilliant being able to visit some of these tectonic structures that were active.

I was successful and what I was aware of that made this visit to Costa Rica even more wonderful is that it was on the margin of one of the tectonic plates, and plate tectonics was just developing as a concept at this time – much of the research being carried out by researchers at Columbia's Lamont Geophysical Labs by such people as Le Pichon and colleagues. So, even as I learned so much in this course about modern biology, I was able to observe geology “at work” and visited several of the active volcanoes in this region.

It was a real opportunity to have the ability to visit an area where different biogeographic entities were facing each other and interacting in Central America – the North American biota meeting the South American – where two biogeographic areas that had been separated and developed independently, because of the movement of continental masses, were coming into contact over the past few millions of years.

One of my favourite places where the OTS group worked was in the south – on the Osa Peninsula – which was definitely remote and where I was able to observe and carry out some planned projects. One of those was documenting the succession of scavengers who came over several days to dismember and engorge the remains of a small colt – and from that I was able to take away my observations when examining such carcasses in the fossil record that I studied as part of my PhD. The old adage that “the present is the key to the past” was so true. Without an *in detail* knowledge of what goes on in the present there is no chance of interpreting what one observes in the fossil record. So much of what I learned on this study trip has been of significant use through all of my life.



Our team getting out of the plane that took us down south and the pilot told us that he was not coming back. The only way he could take off from this short landing strip was to have the plane fully without any weight beyond that of the plane itself – so we knew that we had to find another way back to San Jose from this lovely Osa Peninsula!



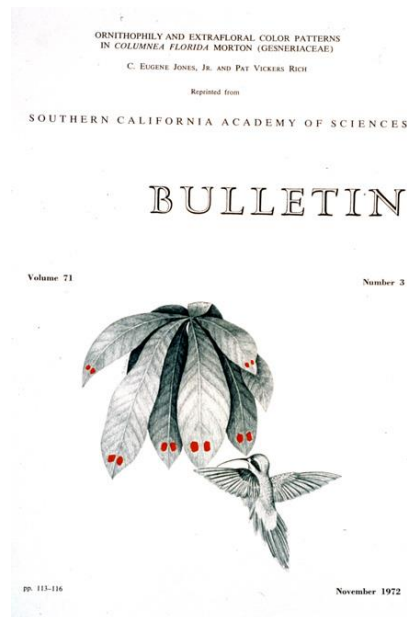
Our enthusiastic team who were mapping the mangroves for all the content we could find. We almost lost Gene Jones, our teacher (the man in the buttoned blue shirt – second from right), when he sank up to his waist in mud and when we pulled him out he left his boots behind. But we got some great data and lost no one. The diversity of backgrounds of this team was brilliant.



Me on the front horse and my pal on the black one. He and I were determined to cross the Costa Rican – Panamanian border and so rented these two horses for a bottle of rum from the local farmer. We rode for most of the day and had wonderful meetings along that way with the locals. We saw so much biodiversity and there were no checkpoints along the dirt track that we took.

Many other adventures took place, not only on the mainland of Costa Rica but on islands off the coast, but one project took the centre of my attention. It was pointed out to me by one of the teachers that there was a little plant that ever so often had two red spots appear on the leaves. Just why this was the case had not yet been figured out. So, I decided, under the direction of Dr Gene Jones, one of our teachers, to sit by this little plant and watch what happened. In fact, I monitored, over many, many days several of these *Columnnea floridas* – a gesneriad – in the San Vito region. Once these red spots began brightening up, the Stripe-throated Hermit Hummingbirds (*Phaethornis striigularis*) reacted. Some came and hovered for awhile, then dipped under the leaves to feed on the flowers which were out in numbers. Others, once they detected the red spot, immediately dipped under the leaves and accessed the flowers. The flowers were completely covered by the leaves so if there had been no signal, the hummers would not have been aware that there were flowers. It seems that some of these birds had memories from the past, for some of the younger ones when they first detected the red spot, hovered for a bit before going under. Other older birds when they spotted the red dots did not waste time hovering, as noted above – they went for their lunch! Another hummingbird, the Green-Crowned Brilliant (*Heliodoxa jacula*) was also a user of these red dots to find flowers and food.

And as a result of that study, Dr Jones and I published a research paper on this co-evolved system and Susan Payne crafted the beautiful painting that gained the cover of volume 71, number 3 of the *Bulletin of the Southern California Academy of Sciences* in November 1972. After this study I almost decided to become a pollination biologist, but the lure of the fossil record grabbed me back into the past! Those lessons learned in the explorations that I undertook as an OTS student in Costa Rica have given me a *much appreciated* data base for all of my future palaeontological research and teaching. Thank you OTS!!!



Bibliography

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