



核心的躍昇

蒐藏研究雙年報(92 - 93年)

Great Improvement in the Core Collection

Biennial Report of Collection and Research (2003 - 2004)



國立自然科學博物館

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楔子

博物館核心產能的躍昇

如眾所週知的，博物館事業發展至今，國內外各種公私立不同規模與宗旨的機構相當多元，儘管許多機構都依自己的定義認定自己是「博物館」而顯得五花八門。不過，博物館學術界都共同強調：蒐藏、研究、展示、教育乃是博物館四大任務，其中「蒐藏與研究」工作又是展示教育的基礎與前提。

如果說展示和教育是博物館的軀幹和骨肉，那麼蒐藏和研究就是博物館的心臟和靈魂，因此毫無疑問的，蒐藏與研究共構了博物館的「核心」產能。因為在實質意義上，博物館的重要性不在建築物而是藏品，沒有藏品與知識，就等於沒有博物館的存在 (Timothy Ambrose, 1993)。

其次就博物館「蒐藏」的目的而言，我們更可以看出館藏與研究工作貢獻於知識開發的意義。藏品本身就是「知識」，藏品入庫為的就是要研究並發揚知識的價值，因此展示和教育成為合理而必要的功能整合，博物館貢獻於人類社會的產能自然有賴於藏品知識的累積與開發。

近年來人類共同體認生存環境和生命價值的永續經營發展，是建立在生物多樣性的基礎上，強調地球上所有生物的存亡環環相扣，人類是地球生態中的一環，無論是食衣住行、經濟文化各層面都離不開自然資源的運用。所謂「綠色國民所得」強調的是綠色消費、生態平衡、生物多樣性與景觀價值等，說明了在人文、社會、自然等各個面向，大自然編織出生生不息的生命之網才是重要的關鍵角色。

鑒於生物多樣性的可貴，以及知識產能開發使命的迫切性，本館提昇了館藏目標的自我要求，自93年起，設定每年60000件以上的標本入館目標成為既定的蒐藏政策，預計10年後館藏標本能超過120萬件。以92

年為例，全年標本進館蒐藏量為34,847件，但在93年立刻有顯著的增加，全年館藏達到68,651件以上。蒐藏政策急速擴充的意義，一方面在體現生物多樣性的可貴，一方面使本館知識貢獻社會的核心產能可以快速提昇。如果也能算是些微的成就，那是蒐藏研究部門同仁共同努力的付出，文化耕耘播種的工作一步一腳印，我們相信這項核心產能的躍昇日後必然開花結果！



【92~93年典藏標本統計年表】

(一) 92年1月至92年12月標本蒐藏數量

項目	採集	購買	捐贈	交換	其他	總計
動物	14,282	0	2,179	0	0	16,461
植物	4,416	40	572	3,715	0	8,743
地質	585	99	1,748	0	0	2,432
人類	7,163	4	44	0	0	7,211
合計	26,446	143	4,543	3,715	0	34,847

(二) 93年1月至93年12月標本蒐藏數量

項目	採集	購買	捐贈	交換	其他	總計
動物	27,834	1,500	2,345	48	207	31,934
植物	6,668	1,809	4,911	4,722	0	18,110
地質	487	495	2,742	0	7	3,731
人類	9,324	1,761	121	0	0	11,206
合計	44,313	5,565	10,119	4,770	214	64,981

植物切片標本	62種	1,467片
植物浸液標本	113種	594瓶
植物活體標本		149種
真菌菌種標本		157株
孢粉玻片標本	4種	1,190片
木材標本	41種	113塊
種子標本		102種
其他標本總計		3,670

93年新增標本蒐藏數量總計：

68,651

(三) 本館截至93年12月底標本蒐藏數量

項目	採集	購買	捐贈	交換	其他	總計
動物	281,325	55,343	71,518	1,748	1,482	411,416
植物	57,695	49,343	24,564	22,627	180	154,409
地質	13,095	7,650	18,259	4	1,082	40,090
人類	47,799	7,427	2,846	0	3,105	61,177
合計	399,914	119,763	117,187	24,379	5,849	667,092

植物切片標本	921種	23,457片
植物浸液標本	1,465種	6,468瓶
植物活體標本		1,934種
真菌菌種標本		1,978株
孢粉玻片標本	453種	4,990片
木材標本	337種	662塊
種子標本		182種
其他標本總計		39,489

本館截至93年12月底標本蒐藏總量：

706,581

>> 重要紀事

【92-93年】

民國92年

92.01 人類學組協助埔里地區籌備第一座校區內大馬璘文化遺址博物館。

92.01.01 成立「國家典藏數位化推動委員會」，館長擔任召集人，兩位副館長擔任副召集人。

92.01.13 國立鳳凰谷鳥園歷經地震與颱風重創，將累積19年一千二百多件世界珍稀鳥類標本送交本館典藏，後來辦理「不會飛的鳥」特展。

92.03.04 植物園 10 年前接受臺東縣金崙鄉張福地先生捐贈植栽血藤終於開花結果。

92.03.05 舉辦「東南亞植物多樣性與植物園經營管理國際學術研討會」。

92.03.18 植物園展示中南美洲熱帶雨林箭毒蛙，飼養2年來已成功繁殖 6 隻小幽靈箭毒蛙，為國內社教機構首次成功繁殖紀錄。

92.03.18 自德國購進一件三疊紀中期距今約兩億三千萬年前，產自大陸貴州之魚龍化石標本，屬尚未發現新種屬，極具學術研究價值。

92.03.27 本館考古人員於七期惠來里遺址挖掘出代表營埔文化和番仔園文化的陶片和獸骨，為解讀臺中盆地史前人類生活重要史料。

92.05.30 國立臺灣大學海洋研究所陳汝勤教授捐贈珍貴深海錳核及岩礦標本近 300 件及重要地質期刊與論文圖書一千一百餘冊。

92.06.12 本館推出「魚龍修復展演」活動，利用甫入館珍稀罕見的魚龍化石標本於展場進行修復工作，為本館首次公開呈現化石清修過程。

92.06.12 臺中市三級古蹟樂成宮捐贈 15 件剪黏作品供典藏展示用。

92.07 舉辦「臺中市尋根——惠來里遺址探訪」活動，帶領小朋友體驗考古工作、見證惠來里考古遺址演變。

92.07 植物學組副研究員楊宗愈和研究助理胡維新二位前往美國密蘇里植物園學習園區業務一個月，於 8 月初返國，攜回三十多種熱帶雨林的物



樂成宮捐贈之剪黏作品



「不會飛的鳥」特展

- 種(枝條或種子)及萱草球莖五十多個品種
- 92.07.09 本館人類學研究人員前往大洋洲拍攝南島語族家屋及原鄉錄影節目於公視播映。
- 92.07.10 國立成功大學地球科學系轉贈陳其瑞教授畢生蒐集岩礦標本八百餘件，大幅充實本館地質館藏。
- 92.07.11 推出「不會飛的鳥類」特展，展出鳳凰谷鳥園移送本館託管之部分鳥類標本，並邀請臺中駝鳥場張啟育先生提供孵化駝鳥，讓民眾了解小駝鳥誕生過程。
- 92.07.12 本館於南投縣埔里鎮所發掘距今 3,000 年大馬璘遺址文物，以電腦 3D 動畫復原現場，並將整個虛擬實境出土過程上網供民眾瀏覽。
- 92.07.17 館史室更新為「蒐藏秘室」展示區，展示館內核心蒐藏、研究成果及重要典藏標本。
- 92.09.16 國立成功大學地球科學系楊宏儀教授捐贈其三十餘年來研究、教學之岩礦標本一千餘件。
- 92.09.18 本館斥資兩千萬向日本古生物團隊購買 4 件白堊紀時期恐龍化石標本，為亞洲至今最具學術意義的恐龍化石。
- 92.09.30 本館於臺中市惠來里遺址出土一具約 1,300 年前番仔園文化完整男童骨骸，深具研究價值。
- 92.10.02 教育部委託辦理「新世紀博物館典藏管理研習會——藏品展示與展品管理」，邀請美國史密森機構所屬美國國立印地安博物館典藏修復員林絹娟博士蒞臨指導。
- 92.11 英國威爾斯地區的苗圃業者 Bleddyn and Sue Wynn-Jones 夫婦及蕨類專家 Richard Hayward 教授前來本館植物園參觀，並由植物園研究人員陪同前往南橫公路採集。
- 92.11 日本東京科學博物館植物園(筑波)園長 Tatsuo Konishi 教授等四名(Goro Kokubugata 博士、Sadamu Matsumoto 博士及 Atsushi Ebihara 先生)前來植物園參觀，並由植物園研究人員陪同前往蘭嶼採集。
- 92.11.04 舉辦「樂成宮剪黏裝修藝術特展——裝扮旱溪媽祖的家」，展出樂成宮捐贈剪黏作品及高雄茄荳萬福宮捐贈剪黏收藏，並邀請匠師現場演示剪黏和交趾陶製作技藝。
- 92.11.07 人類學組副研究員王嵩山以《過去就是現在——當代阿里山鄒族文化形式的社會建構》乙書，獲教育部92年度「原住民教育文化研究著作獎」。
- 92.11.19 本館考古人員於臺中市七期惠來里遺址出土一具約 1,300 年至 1,000 年前中部番仔園文化成年男性完整人骨。
- 92.11.24 本館考古人員受嘉義縣政府委託進行「嘉義縣太保市魚寮遺址考古調查發掘計畫」，確定納骨塔預定地範圍為魚寮遺址的一部分。
- 92.11.27 「失落的史前惠來人——重現科博館特展」展出本館 91 年 9 月間於臺中市惠來里遺址所挖掘之男童遺骸及相關出土文物。
- 92.11.28 本館考古人員於臺中市惠來里遺址發現距今 4,500 年前大坌坑文化陶片，使惠來遺址史前文化層歷史更久遠、更完整。
- 92.12 成立「動物組織冷凍蒐藏中心」。
- 92.12.09 本館考古人員於臺中市惠來里遺址發現第三具年約 20 到 30 歲距今 1,000 到 1,300 年前番仔園文化時期女性骨骸。
- 92.12.17 本館歷經 10 年交涉和奔波，斥資千萬向法國民間收藏家購置古埃及男性木乃伊暨人型棺柩兩項文物，於本館展場公開展出。



惠來人男童遺骸



狄克努棺柩

民國93年



寶石蒐藏

布氏樹蛙

- 93.01 邀請美國密蘇里植物園球根花卉專家Jason Delaney先生前來植物園指導球根花卉種植及演講。
- 93.01.01 執行教育部所屬社教機構服務升級計畫，積極籌設、規劃「地質展示廳」，本計畫預計3年完成。
- 93.01.29 舉辦「土桑珠寶礦物暨化石展」，展出地質學組研究人員前往美國亞歷桑那州土桑市所購得九十餘件博物館級地質標本。
- 93.02.17 本館展示組主任周文豪升任學術副館長，周副館長專長生命科學、兩棲爬蟲類之研究。
- 93.03.31 完成「臺灣南島民族」虛擬展示系統，將數位典藏產出加值應用與虛擬博物館展示教育功能結合。
- 93.04.10 自大陸貴州苗家購進四層 85 坪重達12噸客家吊腳樓一座，費時 22 天組裝重建，舉行復原落成儀式及苗家歌舞表演。
- 93.04.15 敦聘胡忠恆教授、楊宏儀教授、陳汝勤教授、戴昌鳳教授擔任本館地質學組研究客座。
- 93.05 植物學組副研究員楊宗愈前往日本沖繩進行野外採集，並拜訪位在名護的「海洋博公園」；除拜會園長外，並獲贈二株琉球特有棕櫚植物「琉球古路棕」小苗。
- 93.05.01 小小動物園螢火蟲觀察區成功復育臺灣特有水生螢火蟲黃緣螢，建立黃緣螢的復育養殖技術。
- 93.05.03 本館自製「生命的喜悅——駝鳥篇」影片獲選入圍「國際博物館及文化資產影視聽影片」。
- 93.05.21 來臺參加總統就職典禮的哥斯大黎加副總統沙波麗蒞館參觀。
- 93.05.26 臺中縣文化局委託辦理「振興東勢鎮林業文化園區先驅計畫」之「林業文化與空間發展」國際學術研討會，邀請美、加、日、德等各國學者與會。
- 93.06.01 本館考古人員於鹿寮遺址、魚寮遺址、惠來里遺址出土的獸骨中，發現臺灣史上從未記錄過的哺乳類動物「狗獾」殘骨及牙齒，為臺灣動物史及考古史的一重大發現。
- 93.06.04 屏東真笠山區發現消失百年瀕臨絕種植物「武威山茶」，本館研究人員對此珍稀植物進行扦插、組織培養與復育。
- 93.06.24 國立中央大學地球科學系轉贈顏滄波教授畢生蒐集臺灣、日本、韓國等地岩礦標本及薄片七百八十餘件、地質圖幅 88 幀及野帳 50 冊。
- 93.07 植物學組副研究員楊宗愈前往泰國巴達雅雅的「東芭熱帶植物園」，拜會園長 Kampon Tansacha 先生，並獲贈15種棕櫚植物小苗及 8 種棕櫚種子。
- 93.07.17 舉辦「古早臺中人的故事」特展，展出本館於惠來里遺址挖掘出土的獸骨與文物，教育部長杜正勝蒞臨主持揭幕式。
- 93.08 熱帶森林科學研究中心 (Center for Tropical Forest Science) 二位貴賓，由東海大學生命科學系孫義方教授陪同前來參觀本館及植物園。
- 93.08.03 辦理本館「岩壁上的精靈——豔紅鹿子百合特展」大陸巡迴展安排聯繫事宜。
- 93.08.12 舉辦「大型真菌鑑定研習會」推廣大型真菌教育活動。
- 93.08.31 本館副館長周文豪就原「白領樹蛙」進行腺體DNA和聲紋比對後正名為「布氏樹蛙」。
- 93.09.09 舉辦「博物館、知識建構與現代性：慶祝漢寶德館長七秩華誕學術研討會」。
- 93.09 浙江自然博物館來館參訪。
- 93.10 美國園藝學者Ted Herrington前來本館植物園參



貴州龍

觀，並安排至宜蘭棲蘭山及南投合歡山地區進行野外採集。

93.10 蕨類專家 Richard Hayward 教授及 Richard Martin 先生前來本館植物園參觀蕨類植物，並安排前往南投梅峰農場觀看高山蕨類。

93.10.22 辦理太平市自然生態館館藏研究與經營管理研習會。

93.11.02 李家維館長榮獲澳洲外貿部「文化獎勵方案」赴澳參訪。

93.11.18 地質學組研究員程延年博士與加拿大渥太華國家博物館吳肖春博士、北京中國地質科學院季強博士共同於《自然期刊》(Nature)中發表「三疊紀海棲爬行動物(貴州龍)產下活的幼體(胎生)」之重要研究成果。

93.12 辦理第五屆海峽兩岸鳥類學術研討會。

93.12 植物學組副研究員楊宗愈前往澳洲雪梨皇家植物園(Royal Botanic Garden, Sydney)及其分園「安娜山區植物園」(RBG, Monta Anna Botanic Garden)參訪；和「瓦勒邁國際公司」(Wollemi Pine International Company)的經理 Sally McGeoch女士商談有關捐贈本館瓦勒邁杉活體一事，並委託其協助查詢澳洲植物進口臺灣等事宜。

93.12.14 日本名古屋女子大學退休教授、國際知名鞘翅目分類學者佐藤正孝捐贈其40年來所採集10萬件昆蟲標本予本館，為本館開館以來最大一筆捐贈。

93.12.23 李家維館長93年度績效評核經教育部評定為最高等第一「卓越」。

93.12.23 本館與國立臺灣博物館進行「德氏水牛」與「早板中國犀」標本複製品的製作與交換，為國內自然史博物館邁出合作第一步。

93.12.24 舉行「昆士蘭瓶幹樹捐贈種植儀式」暨「澳洲植物區」設立記者會。兩棵自澳洲引進的多種原產園藝樹種——昆士蘭瓶幹樹，又名「佛肚樹」，為本區最顯著樹種。



瓶幹樹



>> 學組動態

【92-93年】





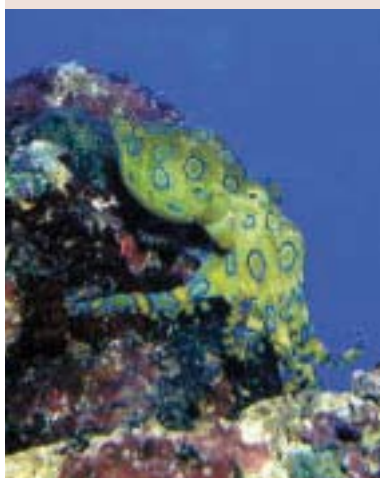
>>動物學組

這兩年來動物學組有些變動，特別是在人員方面，鳥獸學門顏重威研究員即將退休，無脊椎動物學門施習德博士也即將轉任中興大學。未來，我們希望有一位鳥類或獸類的研究人員，及一位陸生無脊椎動物人員加入動物組研究團隊。

本館動物標本蒐藏量已達41萬件，但仍有很大的增加空間。未來我們仍會以臺灣地區的標本為主，期望將臺灣的動物標本收集完整，再放眼東亞地區。

動物組的標本占全館 2/3 以上，各類別已非常豐富，質與量都位居全國之冠。我們將透過國科會補助，積極爭取各個類別的國內、外專家到本館作短期的研究，以妥善利用及保存這些標本；也歡迎國內、外各研究機構的動物學專家到本館合作及交流。

動物組目前負責本館小小動物園及展示場巨蟹缸及珊瑚礁缸之經營及管理。動物活體長期飼養、展示及開發工作非常辛苦。同仁在蒐藏及研究工作之餘，還要長期支援、開發活體展示生物及不定期之特展，但由於大家的付出，本組93年績效成績全館第一名，希望同仁繼續努力，作一位全方位的博物館人。



無脊椎學門



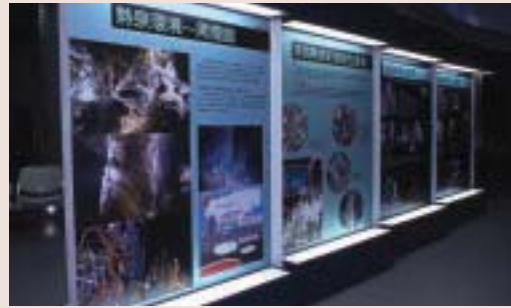
在墾丁海域放流馬糞海膽

趙世民

研究員兼動物組主任

我的老師說：「行政工作是幫別人的孩子洗尿布。」現在已不是洗尿布的時代，我只是在「幫別人的孩子換尿片而已！」，換尿片可比洗尿布輕鬆多了！動物組同仁在研究方面相當優秀，幾乎每人每年都有館外研究計畫，不會整天圍著我，吵著「分家產」。因此我當主任的首要工作，就是幫大家「開會」。

研究方面，這2年的主要研究工作是棘皮動物的分類及生態，主要在臺灣周圍海域進行大陸棚及深海底棲動物採集及研究工作，特別是棘皮動物方面，也進行墾丁國家公園珊瑚礁區棘皮動物生態、多樣性及海膽的復育研究工作。這兩年執行的研究計畫有：一、深海棘皮動物多樣性之研究（國科會）。二、臺灣北部及東北部海域棘皮動物多樣性之研究：海參多樣性及資源量之調查研究（農委會）。三、墾丁國家公園海域底棲無脊椎動物之變遷——以棘皮動物為例（墾管處）。四、利用館藏標本協助中小學教材之開發研究（教育部）。



「深海熱泉」特展

在科教和展示方面，93年協助完成「深海熱泉」特展，向法國自然史博物館借到熱泉蟹、熱泉蝦、龐貝蟲等珍貴標本。93年開始協助珊瑚缸及大陸棚巨蟹缸活體展示的完成。目前認養的展場是小小動物園的活體展示區，活體動物的長期展示相當不易，飼養與管理更是辛苦，但二年多來也有許多實務上的收穫，也認識許多國中、小熱衷自然生態教學的老師，豐富了我的生命，也給了我許多研究的靈感。

博物館的蒐藏、研究、科學教育及展示的工作多元又有趣，套句目前生物學熱門的詞兒，「多樣性非常高」，我熱愛我的工作！



「深海熱泉」特展

「深海熱泉」特展



眼斑海葵魚



原瘤海星



角海葵

李坤瑄

助理研究員

一、92年初設立小小動物園海洋無脊椎動物及河口紅樹林生態展示

雖然活體生物的飼育對我們造成極大的挑戰及困擾，但是在科普教育及展示上卻發揮了極大的效果，更讓館內原本閒置多年的二樓戶外空間活絡了起來。陸續飼育及展出了超過百種以上的海洋無脊椎動物及魚類，由於解說的圖片、資料甚至看板都是由本學門自行製作，因此累積的圖片及解說文字足以出版一本厚厚的海洋生物圖鑑了。



潛水採集

二、93上半年動物標本製作現場演示特展

為了讓觀眾了解動物標本的製作過程及運用，在93年的上半年，動員了全組4個學門的人力，在一樓展場推出了「動物標本製作現場演示特展」，各學門輪流派人在展示現場演示標本製作的過程，並當場與觀眾互動，回答觀眾所提出的相關問題。由於本學門的人力不足，雖然每週只輪值週二的兩個場次，但上自蒐藏經理，下至委外的技術員，通通都得上陣(其實總共也只有3人)。此種坐在玻璃櫥窗中直接面對觀眾的特殊經驗，讓我深深體會到檳榔西施們辛苦的一面；但也讓我認知到一般民眾是多麼需要一個能夠即問即答的窗口，來迅速解答他們的疑惑。

三、93年底設立「芸芸眾生」珊瑚礁生態活體展示缸

吸收了小小動物園建造及營運所遭遇的困苦經驗，加上較為充裕的資金與廠商的專業規劃，我們成功地將一個較為穩定而美麗的珊瑚礁生態系，活生生地呈現在觀眾的眼前，而且一路成功地拍攝到許多珊瑚礁動物的有趣互動與共生狀況。也使我们進一步要籌設龜山島海底的奇異蟹類——硫磺怪方蟹的活體展示。

四、92及93年執行國科會「深海棘皮動物多樣性之研究」計畫，及本館「臺灣沿海陸棚無脊椎動物多樣性」研究

執行計畫期間，多次搭乘「海研一號」研究船及漁船出海採集，數度遭遇到天候不佳的風浪侵襲，深深體驗到暈船及吐個不停的海上作業艱辛。兩年間累積登錄的標本多達13個動物門、367科、1,048種、3,582件，目前尚有數百件來自500公尺以下至3,000公尺深海之稀有無脊椎標本，有待專家深入鑑定，其中大多為臺灣之新紀錄種，甚至是世界新種。



出海採集標本



小小動物園參觀民眾

昆蟲學門 比蝨子門



於比夏自然史博物館昆蟲蒐藏庫中檢視盲蝨模式標本

林政行

研究員

在研究方面，由於國科會的支持，使我得以進行臺灣之中國大陸亞熱帶地區盲蝨多樣性的研究。而國科會提供國外旅費資助，則讓我有機會前往匈牙利自然史博物館 (Hungarian Natural History Museum)、維也納自然史博物館 (Vienna Natural History Museum) 及夏威夷比夏自然史博物館 (Bishop Natural History Museum) 檢視盲蝨模式標本，真是受益良多。此外，也曾前往中國大陸貴州貴陽市花溪、綏陽縣寬闊水保護區、福建武夷山自然保護區、廣西金秀瑤族自治縣大瑤山森林自然保護區、上思壯族自治縣十萬大山保護區及天津薊縣八仙山自然保護區採集，除了增廣見聞外，也採集了許多標本。很高興首次發表臺灣及中國大陸之新紀錄亞科薩盲蝨亞科之3新種，也發表樹蝨亞科之10新



於比夏自然史博物館昆蟲蒐藏庫與 Mr. G. Allan Samuelson 合影

種、單室盲蝨亞科薩盲蝨屬3新種。

由於參與國家型數位典藏計畫，並有機會前往美國辛辛那提 (Cincinnati) 參加昆蟲蒐藏年會 (Entomological Collection Network Meeting) 及美國第 20 屆昆蟲學會年會 (Entomological Society Meeting)。在展示方面，則參與紅火蟻特展之規劃及其他館內業務之諮詢建議等。



紅火蟻特展



顧世紅

副研究員

昆蟲的蛻皮與變態是昆蟲生命過程中十分重要的環節，對其生理現象的探討，有助於充分瞭解生物之進化機制等有關生命現象的基本原理。同時，昆蟲蛻皮與變態的現象為一自然界十分有趣的題材，對其生理機制的探討可為博物館就科學現象之展示及對社會大眾的教育提供一個很好的實例，以啟發大家探索大自然的奧秘。基於上述特點，本館動物學組昆蟲生理實驗室近年來以家蠶等鱗翅目類昆蟲作為實驗材料，就昆蟲生長與發育的內分泌及細胞生長機制等進行了一系列深入探討，其研究成果均發表於國際昆蟲學及內分泌學的一流學術期刊，共計二十多篇。主要研究成果可分為兩個部分：

一、中心法則的擴展。早在五十年代，昆蟲學家們就已確立了調控昆蟲生長與發育的中心法則，按照這一法則，蛻皮激素的升高引起昆蟲蛻皮的發生，而青春激素的量控制了蛻皮的性質，即青春激素的量多，引起幼蟲蛻皮，量少，引起幼蟲變蛹的變態蛻皮。而我們近年來的研究顯示，咽側體之分泌青春激素量的多少本身由蛻皮激素所控制，家蠶之5齡早期血液中低濃度的蛻皮激素導致咽側體在中期停止分泌青春激素，從而在5齡的末期誘導幼蟲變蛹的變態蛻皮。因此，我們的結果充分顯示了一種新的調控機制，即幼蟲蛻皮的性質本身由蛻皮激素量的多少所控制，從而使半個多世紀前就已確立的中心法則得到進一步的擴展。這也是國人第一次在昆蟲內分泌學的中心法則上，不讓外國人專美於前的一個例子。

二、前胸腺新的功能之發現。一般來說，昆蟲之前胸腺的唯一功能為分泌蛻皮激素，從而誘發昆蟲的蛻皮與變態。而我們最新的研究結果顯示，家蠶的前胸腺除了分泌蛻皮激素外，另外還分泌自體分泌因

子，該因子分泌後促進細胞本身之生長及蛻皮激素分泌。此一前胸腺細胞自體分泌現象，在昆蟲生理學領域從未有過報導，此一方面的深入探討，可使臺灣在此領域領先其他國家，極具研究潛力。

三、我們近年來所發表的一系列研究成果受到了國內外相關領域學者專家的關注，2002年在美國出版的兩本昆蟲生理學相關的大學教科書中都引用了我們近年來所發表的學術論文：1. *Physiological Systems in Insects* (Klowden M. J. edited, Academic Press, 2002)；2. *Insect Physiology and Biochemistry* (Nation J. L. edited, CRC Press, 2002)。另外，2004年由 Kluwer Academic Publishers 所出版的 *Encyclopedia of Entomology* (Capinera J. L. edited) 中也引用了我們所發表的研究報告。

在科教展示方面，繼前幾年的「昆蟲化學語言特展」，我們結合本身的研究材料，在本館「小小動物園」展場推出「蠶寶寶的一生」之展覽，及劇場教室講授「抽絲剝繭」的教案，使小朋友們更為瞭解昆蟲世界的奧秘，增加其探索自然及求知的興趣。

蠶寶寶也是小朋友們最熟悉的昆蟲之一，本館「小小動物園——蠶寶寶的一生」展室一角。





烘烤枯枝落葉



黃坤燁

助理研究員

93年開始進行土壤蟎的採集蒐藏工作，這是全新的經驗。本計畫的主要目的是要瞭解臺灣土壤蟎類應有的種類，及各種土蟎數量隨季節變化的情形。基於上述的認知，將臺灣分為北部、東部、西部及南部四區，每區再設置低、中、高海拔的森林樣區。完成紙上作業後，與楊萬琮先生於臺中市大坑及南投蓮華池各設置2個土壤樣區，分別採集 50 平方公分的枯枝落葉，及深30公分的土壤樣本回博物館，再經過博氏漏斗收集土蟎，然後請工讀生挑蟎再做成玻片，這一套程序證實可行後，2月份就前往全臺各地採集土壤樣本。在這一年多的採集中，因為各個樣本點距離遙遠，而出差時間有限，每天忙到六、七點才休息。從這些採集行程中，得到了許多全新的經驗，93年2月於南橫埡口被0凍到從此不怕冷，3月於武嶺鏟雪三十幾公分，才能採到土壤樣本，這對於在亞熱帶臺灣的田野工作人員，應該是難得的經驗，還有接連二天爬登關山及玉山樣區，不得不承認年紀大了，同時

也見識到金翼白眉為何是垃圾鳥。5月於福山植物園，看著雉雞媽媽領著一群小 baby，而雉雞爸爸押後催趕著小 baby 快走，一家人大搖大擺、無視我存在的由我面前經過，以及那隻猴王安詳拔著葉子吃，然後回頭瞪我的神情等等。

93年前半年因還有些計畫經費，可以聘請臨時工來幫忙挑蟲及做玻片，但畢竟這些計畫並非是做土蟎的經費，心想既然已做土蟎，為何不去申請計畫來維持，如此就可拿外面的錢來做博物館的工作，於是在同仁的引介下，與林務局負責生物多樣性計畫的許技正碰了面，她非常支持此計畫，因為在過去數十年，臺灣進行非常多的生物多樣性或資源調查的計畫，但土蟎卻一直無法得到資料，同時很多標本都無法留存，就這樣得到林務局的經費支持。

經過一年的採集，共登錄蟎標本3,000號，採集蟎標本約15,000隻，新增玻片標本約4,000片及鑑定蟎標本約1,000片。



採集土壤



土蟎樣區設置



與 Dr. Edward Mockford 於美國機場合影

詹美鈴

助理研究員

昆蟲學門在標本蒐藏方面，兩年來共計登錄了 41,915 件標本，其中包括師大徐培峰教授、Dr. Stefan Naumann、Dr. Kimio Masumoto 和 Dr. Young June Lee 等捐贈之正模和副模共 36 件，讓本館之模式標本數量增加不少。本學門亦與陽明山國家公園洽談將標本存放本館之合作辦法，目前已有五千餘件標本放置於本館，並已經過除霉防蟲處理。另外，林素華女士慷慨答應

捐贈部分已故私人蒐藏家王生鏗先生蒐藏之昆蟲標本及相關昆蟲加工用品予博物館，現正陸續整理中。93 年向周文一先生購買 15,000 件昆蟲標本，包括近 500 種天牛在內，和向德國 Mr. Karl Werner 購買二千餘件約 600 種兜蟲標

本。最難得的是，透過李奇峰博士邀請日本佐藤正孝教授來館參觀，佐藤教授肯定本館之蒐藏條件，願將十萬件昆蟲標本捐贈本館，目前已運回五萬三千餘件，預計 94 年再前往日本運回其餘標本。蒐藏於本館庫房內的標本也未閒置，工作人員除進行各目資料分類、資料輸入電腦及校對外，亦進行雙翅目和蝴蝶等八千餘件標本之盤點，和提供各機構包括臺灣、日本、德國、匈牙利、美國、波蘭等國昆蟲學者來館檢視標本或標本借出，兩年來共計借出 39 筆 1,522 件標本供研究使用。

在研究方面，仍繼續進行臺灣的嗜蟲分類研究。92 年進行臺灣鞘網嗜蟲分類研究，此科在臺灣為新發現，雄蟲具一般膜質的翅，雌蟲則像甲蟲，相當特別。因嗜蟲極微小，不易解剖，所以藉參加美國昆蟲



長梗紫麻上的狹嗜蟲科若蟲

學會年會之便，至美國伊利諾州州立大學向嗜蟲專家 Dr. Edward Mockford 學習如何解剖與標本製作，Dr. Mockford 研究嗜蟲超過 60 年，當時已 76 歲高齡，仍能穩定地解剖小於 0.2 公分嗜蟲的生殖器，令人敬佩崇拜，希望自己年老後亦能如此。93 年進行臺灣離嗜科、雙嗜科、星嗜蟲科和半嗜蟲科之分類研究，希望能逐漸瞭解臺灣的嗜蟲種類與分布。最值得一提的是，

奇美醫學中心皮膚科林俞志醫師在病人趾甲內發現嗜蟲，請求鑑定，進而與之共同於英國 "Clinical and Experimental Dermatology" 期刊中發表此一病例報告，還成為封面論文。

科教與展示方面，92 年度協助科教組規劃「昆蟲的

翅」活動演示教案，讓觀眾對昆蟲的翅有更進一步瞭解。另和動物組同仁一起規劃「動物標本製作展演」特展。在透明櫥窗內製作標本和解說，對長年隱藏幕後的工作人員和工讀生來說是一大挑戰，工讀生更戲稱自己為「櫥窗男郎」。93 年度國科會規劃科學週活動，與中興大學楊恩誠教授共同規劃「昆蟲複眼」單元。另外，為配合時事，與林宗岐博士和館內科教與展示人員共同策劃「異蟻份子——入侵紅火蟻」特展活動，並同時推出巡迴展至全省各地巡迴，頗獲好評。同時，也協助典藏管理組許美蓉小姐推出「甲蟲緣、佐藤心」特展，可惜礙於場地限制，無法將所有標本展出。另協助自然學友之家購買科教用昆蟲標本一批，均挑選較特殊且大型之種類，希望引起大眾對昆蟲的喜愛。



Coleotroctellus sp. 雌蟲



Coleotroctellus sp. 雄蟲



群聚於樹幹上之嗜蟲若蟲

兩爬學門

周文豪

研究員兼學術副館長



「你或臺灣同行在兩棲爬行動物方面又有什麼新發現？新著作？」經常有來自國際友人詢問，令人深感壓力與鼓舞。

兩年匆匆而過，橫亙於前的繁重行政工作，讓自己在學術的思維與動力有些遲緩與虛弱。幸好有合作夥伴奮力不懈，這二年才不致交出白卷。

與英國威爾斯大學同僚合作的臺灣赤尾青竹絲 (*Trimeresurus stejnegeri*) 的遺傳多樣性研究一直有成果發表，這二年也有新的進展。所有成果在紀念李鎮源院士的毒蛇蛋白國際學術研討會中，作總整理與報告，終告一段落。

這幾年來，農委會一直支持臺灣特稀有兩棲類的保育遺傳研究。過去我曾整理梭德氏赤蛙 (*Rana sauteri*) 的蝌蚪形態變異，從中釐出隱存種或亞種，這期間我和張廖先生企圖由遺傳多樣性來檢驗往昔以形態數據為依據的推論，發現形態多樣性的緣由，但更令人驚訝的是這個種類的拓殖順序 (Colonization sequence) 是始料未及的。由於梭德氏赤蛙的演化單元清楚，保育策略也可明確，接下來就看我們如何實際落實了。在體會把保育的視野穿透到遺傳多樣性層面的必要性之後，我們趁勢進行橙腹樹蛙的保育工作，已在野外廣泛設置人工繁殖設施，希望提高其族群量之後，能由遺傳多樣性分析獲得保育策略上的啟示。

國科會連續兩年支持生物 / 文化多樣性數位博物館計畫，先前已完成阿里山的民族生物學計畫，我們再度完成「大埔里地區自然資源與民族生物學」計畫，已在網上展出。國科會的「豎琴蛙與腹斑蛙的遺傳分化及其與其他巢蛙的親緣關

係」發現這兩種蛙雖然外形相像，遺傳分化的確明顯，而且親緣關係最近；六種巢蛙的生殖行為可分為築巢與不築巢二群，但生殖行為的相似性並不與親緣關係完全相關，表示生殖行為在演化過程中有反祖的現象。

就生物多樣性的觀點來看，「必也正名乎」是研究重點的一環。臺灣的兩棲類生物多樣性研究，亦朝向正名的問題討論，相關物種包括白領樹蛙 (*Polypedates megacephalus*)、盤谷蟾蜍 (*Bufo bankorensis*) 和斯文豪氏蛙 (*Rana swinhoana*)。目前已較明確的是白領樹蛙，經由新加坡、香港、大陸福建、廣東、廣西、雲南及臺灣族群的鳴聲與DNA的分析發現，其實這些所謂的白領樹蛙應分成二種，即原有的白領樹蛙 (*P. leucomystax*)，分布於新加坡、香港、廣東、廣西及雲南。香港是“*P. megacephalus*”的模式產地，本種有可能是 *P. leucomystax* 的同物異名。八十年代以來定名為 *P. megacephalus* 的臺灣族群與福州族群屬同一演化單元，與 *P. leucomystax* 有明顯的分化，因此，模式產地為臺灣的 *P. braueri* 應是有效的。盤谷蟾蜍及斯文豪氏蛙的研究正在進行中。

這二年，由於接受李家維館長徵召，連續參與科教組、展示組的工作及學術副館長的職務，行政工作費去絕大部分的時間。除此之外，為開拓本館科學教育的領域，投入許多心力在鳳凰谷自然教育園區的規劃與初步設計上，但鳳凰谷鳥園的重建與歸屬問題仍懸而未決，本館自然教育園區的實現只能暫時停頓。再者，臺灣大學農學院臺大實驗林管理處合作的溪頭樹冠層研究、教育與展示合作計畫雖完成細部設計，不幸在發包施作之前因土石流發生而終止，讓投入的心力未能獲得成效，是這二年來較遺憾的事，幸好這些努力不算白費，因為有了基礎之後，遇適當的時機仍可美夢成真的。

布氏樹蛙
Polypedates braueri



黃文山

助理研究員

兩爬學門主要蒐藏臺灣的兩生爬蟲動物，並兼蒐藏魚類標本，因同仁的努力在 92~93 年度共蒐藏兩生類 183 件、爬蟲類 716 件及魚類 3,000 件，迄今兩爬學門總共蒐藏兩生類 10,993 件、爬蟲類 6,782 件及魚類 3,010 件；在臺灣各機關團體中兩爬標本蒐藏量名列前茅，而魚類標本蒐藏正迎頭趕上。辦理特展方面，92~93 年度共配合協助辦理掠食者特展、館史室特展、大陸標本特展（異鄉的標本使者）。

學術研究方面，因我過去 3 年皆在美國康乃爾大學進修，所有研究環繞在蘭嶼島上爬蟲生物學的研

究，主題包括爬蟲多樣性、行為生態及牠們的生態功能和結構；這些研究並觸及生態模型(modeling)建立及預測。康乃爾大學位於美國東北部紐約州的綺色佳(Ithaca)，冬天大雪紛飛達半年之久，每天徒步上課，有時雪掩膝蓋猶奮力向前，不可謂不苦也，但這一切都值得。記得冬夜苦思一蜥蜴行為模型達數日之久，皆不可得；忽然瞥見一本經濟學的書，心中靈光一閃，我的模型不正是如此嗎？繼而逐步驗正，果然大致吻合；大喜心情持續數日之久，一直到與模型教授討論後方止。



康乃爾大學冬雪一景



長尾南蜥護幼行為

鳥獸學門



日本獾頭骨標本

陳彥君

助理研究員

鳥獸學門在92及93年度，拜政府擴大就業計畫之賜，額外得到3名得力的標本剝製臨時人員，得以在92年下半年度起加速剝製標本工作，至93年底共剝製2,000件小型哺乳類標本及800件鳥類標本，目前學門總蒐藏量為獸類為8,900件，鳥類為7,500件，並均以臺灣產野生鳥獸為主。這兩年較為重要的蒐藏包括92年東海大學生命科學系林良恭教授所捐贈之臺灣睽違已久的水鼯 (*Chimarogale himalayica*，又稱亞洲水鼠) 2件。此外，由日本貂類專家細田徹治採集、日本國立科學博物館動物第一研究室遠藤秀紀博士剝製、北海道大學押田龍夫博士代表捐贈的日本獾骨標本3件，代表日本學者肯定本館用心蒐藏研究而給予的熱心協助。透過這3件日本獾頭骨比對，本館初步證實臺灣中部考古挖掘所得500-2,000年前左右動物遺骨，的確有亞洲獾 (*Meles meles*) 的存在。其他數量較大的蒐藏包括鳳凰谷鳥園標本1,200件，及陳加盛先生製作蒐藏鳥類標本420件。

在學術活動方面，92年主辦「第五屆海峽兩岸鳥類學術研討會」，共蒐集海峽兩岸共37篇論文發表，中國大陸代表共24人前來參加，臺灣學界報名參加踴躍，約200人與會，出版論文集一本，圓滿閉幕。93年代表本館出席東京國際生物研討會，並為2003年日人發表新種鬚鯨——角島鯨後續相關論文“Recognition of taxonomic status of *Balaenoptera omuri*”之共同作者，本館典藏之角島鯨標本四件，是日人研究該新種時之重要參考標本。

協助展示教育方面，92年與花蓮黑潮海洋文教基金會合作，策劃執行「花東鯨豚影像展——飛旋、花紋、熱帶斑」，展出臺灣東部鯨豚的美麗身影，並透過水底錄音，首度揭露牠們的聲音。93年策劃執行「猴年特展——重新發現臺灣獼猴」，介紹臺灣獼猴原為古老子遺物種之最新發現；重訪1862年英國副領事史溫侯發表臺灣獼猴學名時之原始棲地——今高雄旗津港口及中山大學，來做今昔之對照；並搜羅各種靈長類頭骨與標本、設計觀眾參與全館抓猴遊戲，廣泛介紹靈長類動物與本館的精華展示區。

其他工作人員

- 約聘技術員：張廖年鴻
- 技工：洪和田、楊萬琮、張正雄
- 標本製作及處理人員：李淑娟、詹惠足、吳梅君、劉佳欣
- 計畫助理：廖慶隆



鯨豚影像展

重要蒐藏與研究成果



俗稱三角姑的脂鯰

年度新增重要蒐藏業務

館內的魚類標本典藏，始於 80 年詹見平先生所捐贈的一批主要採自大甲溪的魚類標本。然而，本館並無專責管理魚類標本的單位，因此這批標本長久以來皆埋藏於本館浸液標本庫的一角，鮮有人去整理及注意。

91年 9 月 10 日間，在一次與大陸中科院共同執行的大陸廣西地區考察行程中獲得一批當地淡水魚標本，其中包含了當地俗稱洞穴魚的無眼嶺鰍 (*Oreonectes anophthalmus*) 及金線魚巴屬的宜山金線魚巴 (*Sinocyclocheilus yishanensis*) 標本，彌足珍貴，由此興起建立館內魚類標本典藏的念頭。這個想法獲得李館長、周副館長 (同時為動物學組兩棲爬蟲學門的負責人) 以及動物組趙主任的支持，遂以現有的人力及資源，在動物學組兩棲爬蟲學門的蒐藏架構下取得標本登錄號，開始為魚類標本蒐藏建立正式的典藏管理程序。

萬事起頭難。93 年初，經過一年多的摸索及努力，本館僅有二百多號的魚類標本典藏，標本總尾 (件) 數達 680 件。其中多以溪流淡水魚類為主，並著手整理館內已有而未登錄及鑑定的港口魚類標本 (多由無脊椎學門李坤瑄、洪和田先生在漁港下雜魚堆中帶回保存)。另外，各進行一次屏東大鵬灣地區 (與中研院動物研究所配合) 及臺南七股潟湖採集調查。此時，我們回應中研院動物研究所 (現為生物多樣性中心) 邵廣昭老師的邀請，於報備簽准後將館內的魚類標本典藏資訊公布於「臺灣魚類資料庫」 (<http://fishdb.sinica.edu.tw>) 網站中，與魚類學領域的資料庫同步連結。除了與國內其他 6 個先進的魚類標本庫 (中研院、海洋科技博物館、國立臺灣博物館、臺大標本館、海洋生物研究所、水產試驗所) 進行連結整合外，並可連結到國際魚類資料庫「魚庫」 (<http://fishbase.org>)，此後每隔一季更新一次資料。

由於人力及物力有限，本館的魚類標本蒐藏初期將以較具地區特色的原生種淡水魚類為主。淡水魚類標本的取得受到許多先進的協助，或是提供採集資訊，或是捐贈標本。由於地緣關係，西部沿海的魚類標本亦是本館蒐藏的重點。除了野外的零星採集外，我們也與其他學術單位進行交流合作，如逢甲大學郭鍾秀老師、高雄海洋科技大學黃榮富老師等，協助處理或鑑定該單位研究計畫中所取得魚類標本。此舉對於我們標本蒐藏量的增加助益極大。而大溪漁港、東港市場的下雜魚堆中也是很重要的標本來源。

除了增加標本的種類與數量外，我們也希望充分利用這些標本進行學術上的研究。開放標本資訊主要是希望外界能夠瞭解本館的標本蒐藏現況，歡迎學者專家多多利用這些標本。而館內並與日本京都大學渡邊勝敏博士合作，對臺灣的鮭科魚類進行詳細的分布調查與族群變異的研究。這些研究過的鮭科魚類標本都將妥善保存於本館的浸液標本庫中。

94年除了持續增加對淡水魚類標本的蒐藏，我們計劃將蒐藏重點轉到小型的沿岸礁區魚類，希望藉由轉變蒐藏焦點來增加標本蒐藏的廣度。標本的處理將延續以往的態度，儘量做到展鱗、固定、拍攝標本照等程序，並儘可能的另存酒精或冷凍組織樣本。妥善保存、充分利用每一件樣本，是我們對於這些犧牲的小魚所表達的基本敬意。

喜歡在激流中活動的臺灣纓口鰍 (*Crossostoma lacustre*)

日本琵琶湖畔採集情形

92~93年發表著作

期刊論文

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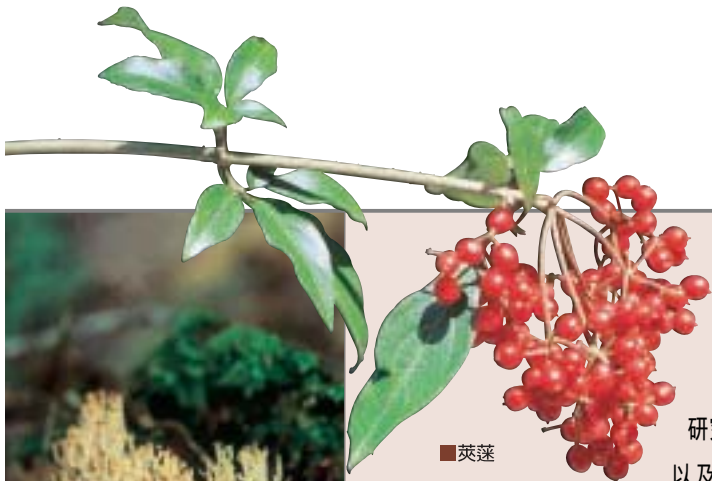
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>> 植物學組





■ 莢蒾

92年與93年植物學組的工作成果可就蒐藏、研究、展示科教支援以及執行數位典藏計畫四方面來說明。

標本蒐藏方面，92年登錄入館標本8,743件。93年配合本館倍增計畫，在全組人員努力下達到19,410件。標本野外採集，除了臺灣地區，同仁也前往大陸雲南、四川以及東北地區採集植物及真菌標本；另有為數不少的標本是與大陸的研究機構交流所得，其中以維管束植物與苔蘚植物較多。此外，本組經營多年的玻片與浸液標本蒐藏，也在93年開始分批納入本館的標本管理作業系統。種原保存除了真菌菌種已有長久經營成果，已累積近兩千株活菌株之保存；針對重要本地植物種類所進行的種原保存工作亦已於93年開展。植物活體保存，除於本館植物園區進行，也與其他公私立林場及農場建立合作，拓展植栽據點。92年下半年本館植物園由科教組改移本組後，植物園與蒐藏研究兩部門工作相互配合，取得加乘效

果。研究方面，92年全組研究人員發表研究論文10篇，93年9篇。本組人員近兩年來對本館展示最顯著的貢獻是支援本館植物園依時序所推出的各項特展。此外，以「花的前世今生」為主題的特展、通俗出版品以及網路教材的推出，是本組支援科教展示活動的典範。92年本組支援推出的網路教材「真菌一族」得到第十屆金學獎佳作。92年起本館正式參與5年期的數位典藏國家型計畫，本組以「維管束植物」、「非維管束植物」以及「菌類」3項子計畫逐年推動這項建構數位知識的計畫，工作重心為「典藏知識單位」、「館藏標本」以及「模式標本」等內容介紹。



杯冠珊瑚菌



屏東鐵線蓮



小皮傘菌

維管束植物學門

楊宗愈

副研究員

持續進行蘭嶼植物調查及採集，並在92年3月於本館舉行的「東亞植物多樣性國際學術研討會暨植物園經營管理研討會」上作「蘭嶼植物資源調查」報告。當年秋季前往大陸雲南香格里拉高山植物園籌建辦和負責人方震東先生商談共同考察此角莫西山植物資源，以及和天津自然博物館、大連自然博物館徵集該二地區維管束標本。93年進行瀕危植物「武威山茶」、「蘭嶼野牡丹藤」及「蘭嶼法氏薑」之保育工作，目前「蘭嶼野牡丹藤」及「蘭嶼法氏薑」均有小苗在本館植物園苗圃中培育。「武威山茶」則包括扦插苗、組織培養苗及實生苗，在本館植物園苗圃中進行復育工作。



蘭嶼野牡丹藤 (*Medinilla hayataiana*)





邱少婷

副研究員

主要研究為植物功能形態學，探索特殊植物的構造功能及其生活史，以及桑寄生植物除了臺灣和華南地區、海南島等採集外，進行系統分類及地理分布的探索。並與長庚大學共同合作天然藥物資源的分析，將桑寄生植物的萃取生物質比對應用，提供化學分類和藥理試驗的深入研究。

另一方面根據桑寄生植物的親緣演化關係，慎選桑寄生植物類群與醫藥界合作，研究特殊桑寄生植物胺基酸和蛋白質的基因，目前已抽取基因，進入以基因轉殖方式試驗量產桑寄生植物的特殊物質。

持續蔓藤植物的研究，比較忍冬屬親緣近的灌木構造與功能，探討不同海拔分布演化與生態適應，近期將以蔓藤在中海拔森林中所扮演的角色為研究目標。



在梨山一帶觀察到的高氏槲寄生



紅花百香果

此外，並於靜宜大學生態所共同指導研究生在澎湖群島與龜山島的島嶼植被研究，針對特殊植物的適應策略和生活史深入探討，近期則著手腐生性多枝霉草的構造與功能探索。

相關「花」主題的探索與應用，包括參與蝴蝶蘭花香構造的研究，推廣介紹花的起源研究，出版「花的前世今生」、設計製作光碟、學習網站和協助「花的傳奇」教案。

陳志雄

助理研究員

研究課題主要為臺灣的高海拔地區植物，包括系統分類研究與親緣關係的探討。目前研究的類群則以龍膽科和玄蔘科為主，材料也包含了鄰近地區的相關物種，尤其是日本和中國華南與西南地區的溫帶類型植物。

在成果部分，針對臺灣產的龍膽科種類，進行花粉的觀察研究，以及染色體的全面性觀察，已經有初步的結果，正撰稿並投付期刊中。

在玄蔘科方面，正在進行婆婆納族的分類研究，其中婆婆納屬的傳統形態研究，已初具成果，並收集更多相關資料比較及分析中。腹水草屬植物則除了臺灣的種類之外，並已經收集了日本地區的材料，也已經進行了核酸萃取及定序，將來即將著手大陸地區的材料，一併進行分析後，期能瞭解該屬親緣演化及地理分布的關係。



腹水草屬植物在臺灣屬於稀有植物，且都為特有種。



王秋美

助理研究員

主要業務是負責植物標本蒐藏管理。標本之蒐藏管理看似簡單，卻是非常繁瑣且耗時，要達到完善管理需要花費很多的心力。目前本學門蒐藏的植物標本約有十多萬件，如何使標本處理流程更為順暢，同時進行電腦化管理，確保標本受到良好的保存和維護，並支援科教和展示方面之利用，以及提供標本資訊與相關文獻資料，便於研究人員之研究，是重點工作。

此外採集植物標本並拍照是個人的業務和樂趣，藉此更了解臺灣的植物資源及生態，過程中發現一些馴化的植物，如野煙樹(*Solanum mauritianum* Scop.)即是一例。目前並研究臺灣產鼠李科的花粉、葉部形態及親緣關係，以期更了解該科的植物並建立基本資料。



野煙樹的花



野煙樹

黃俊霖

研究助理

主要的工作為管理分子系統分類實驗室，並從事禾本科 (Poaceae) 的系統分類與鑑定工作。野生稻 (*Oryza rufipogon*) 族群遺傳變異分析是目前正在進行的研究主題，已自國際水稻研究中心 (IRRI) 取得三十餘個野生稻分布族群的代表，並由基因組已定序完成

的水稻 (*O. sativa*) 所提供的豐富基因資訊，將進一步運用DNA分子標記來探討在族群間遺傳上的關聯及可能受正選汰 (positive selection) 的作用模式。

野生稻 (*Oryza rufipogon*)

非維管束植物學門



林仲剛

助理研究員

長時間浸淫本土性水生植物活體標本的育種作業，從本土珍稀物種的收集與育苗，常見物種的栽植與推廣，乃至外來水草種的交換與種植。並於本館植物園園區內水域，進行（熱帶雨林溫室後方水池）本土性水生植物物種的植入，以營造本土性低地澤塘的生態；於植物園研究大樓後方的小型人工淺水池中，亦利用收集得來的水生植物，進行全新景觀的規劃與佈署。



水生植物養殖

另外，並針對本土性珍稀水生植物進行持續性的育種作業，並且不定量地提供有所需求的單位，做為教學或教材園的材料，如臺灣水韭、大安水蓴衣、風箱樹、窄葉澤瀉等等。

應國立臺灣科學教育館邀約，將浸淫水生植物的經驗與心得，彙撰「水生植物」一書以為國立臺灣科學教育館之科學研習月刊叢書，期能有助於全國中小學師生鄉土教材的教學與學習。本書已於93年11月出版。

有關植物標本的蒐藏業務，則以海藻、地衣以及苔蘚植物為主。已為 *Ramalina* 屬莖狀衣進行地衣物質之分析，定種的作業刻正進行中。



藻類標本採集



真菌學門



羅德威織孔菌
(*Inonotus rodwayi*)
在臺灣只發現於
科博館園區一株
鳳凰木的樹幹上

吳聲華

研究員兼植物學組主任

近兩年在學術研究方面仍持續進行木生型擔子菌 (lignicolous Basidiomycota) 的分類學研究，以皮殼菌 (corticoid fungi) 及多孔菌 (polypore fungi) 為主。除形態分類研究，幾項分子系統學研究計畫也持續進行，其中廣義顯絲菌屬 (*Phanerochaete* s. l.) 研究、薄孔菌屬 (*Antrodia*) 研究、栓菌屬 (*Trametes*) 研究、多孔菌屬 (*Polyporus*) 研究已近完成階段。由薄孔菌屬與相關屬研究所得結果，顯示臺灣特有的「牛樟芝」應為一特有之屬，並非是薄孔菌屬。在93年底，以牛樟芝為模式種發表新屬「臺芝屬」(*Taiwanofungus*)，牛樟芝學名則修訂為 *Taiwanofungus camphoratus*。真菌標本之蒐藏，則持續在臺灣以及中國大陸採集木生型擔子菌為主的大型真菌。15年來協助本館真菌標本蒐藏從零開始，加上其他同仁之努力，目前已達一萬八千多號，為臺灣地區真菌標本蒐藏數量最多之標本館。菌

種蒐藏亦有近二千號，也是臺灣地區菌種重要的蒐藏中心。

93年開始擔任中華民國真菌學會秘書長，辦理多次學術研討會，並進行會員中、英文個人資料之修訂，預為發行通訊錄以及充實學會中、英文版網站內容。91年至今擔任國際真菌學期刊 "Mycoscience" 之編輯委員，並審查過數篇投稿論文。



金黃褶臥孔菌 (*Phylloporia chrysitae*) 在蘭嶼頗常見



王也珍

研究員

92~93年共發表 5 篇學術文章，92年發表2篇，其中一篇是在國外學術期刊發表，描述臺灣毛釘菌的一個世界新種和一個新紀錄種，另一篇是和研究生共同發表臺灣糞生殼菌的5個新紀錄種。93年發表 3 篇文章，其中一篇是在國外學術期刊發表，描述臺灣產一種小口盤菌的世界新種，一篇是報導臺灣 2 種藍斯盤菌的新紀錄種，另一篇是描述臺灣口蘑科的 6 個新紀錄種。文章中描述的標本，均為臺灣本地採集，並收藏於本館的標本庫。

93年與資訊組合作，製作「真菌一族」教育光碟，介紹與人類生活密切相關的真菌種類，並採用無障礙網頁設計協助學生、社會大眾與身心障礙人士學習與真菌相關的知識。此教材榮獲第十屆金學獎佳作獎。



小紅肉杯菌



尖孢小口盤菌

植物園

嚴新富

副研究員

在研究上持續進行臺灣原住民的民族植物及臺灣民間草藥的研究，成果如所發表的論文。而在93年另外參與入侵種農藝作物的清查及監測 (國科會 92-3114-B-002-012) 及臺灣世界遺產潛力點——玉山評估暨研究 (文建會計畫協同主持人) 等研究計畫。

在植物園的展示教育上，在植物園辦理竹類盆栽特展 (展期：7.1~9.30)。另外在研究教育中心前設立多肉植物展示園，並於西屯路景觀道路旁設立臺灣蕨類展示園。

93年在植物園辦理多肉植物與仙人掌特展 (展期：7.2~10.3)。又協助行政院農業委員會農業試驗所舉辦第十一屆國際花卉病毒病害學術研討會。另外建立植物園與館外單位合作蒐集植物活體種源的管道，合作單位及植物蒐集種類如下：

- 一、與國立臺灣大學生物資源暨農學院實驗林管理處合作，蒐集竹類植物、蕨類植物、藥用植物等。
- 二、與國立臺灣大學生物資源暨農學院山地實驗農場合作，蒐集蕨類植物。
- 三、與行政院農業委員會種苗改良繁殖場合作，蒐集天南星科植物、蕨類植物、藥用植物等。
- 四、與行政院農業委員會臺中區農業改良場合作，蒐集藥用植物。
- 五、與杉林溪遊樂事業股份有限公司合作，蒐集藥用植物。



在植物園辦理的
竹類盆栽特展



張正

助理研究員

研究課題為豔紅鹿子百合保育及臺灣原生蘭種原保存，豔紅鹿子百合原生在北臺灣裸露岩壁，因人類濫採導致生長地點趨向偏僻山區，經評估為嚴重瀕臨滅種的物種。保育工作主要為以下四

點：一、長期保存種原：發展組織培養繁殖法、種子繁殖法、鱗片繁殖法以長期保存種原。二、發展人工栽培方法：人工栽培之豔紅鹿子百合做為展示及研究之用途。三、棲地保護：結合原生地的社區、學校、居民，共同來保護棲地。四、舉辦教育推廣展示活動：以教育推廣、實物展示、演講及出版品等管道，推廣豔紅鹿子百合的保育活動。

臺灣原生蘭種原保存物種主要以陽性蘭花及低海拔溼熱森林的蘭科植物為主，第一類以分布在平地陽光充足的綬草、臺灣白及、禾草芋蘭、竹葉蘭、紫苞舌蘭為主。第二類為分布在低海拔溼熱森林的白鶴蘭、梵尼蘭、臺灣蝴蝶蘭、桃紅蝴蝶蘭、四季蘭、報歲蘭、雅美萬代蘭、鶴頂蘭、鳳蘭、櫻石斛蘭為目標，進行種原保存繁殖，並陸續在植物園內進行長期展示。

長期目標將以蘭科植物來豐富科博館植物園的景觀遊憩、科教解說及研究蒐藏。



豔紅鹿子百合



勞倫斯拖鞋蘭



周文能

助理研究員

主要業務是負責植物園影像之拍照，植物名錄、資料彙整與植物名牌之建立，其他則負責菇類的相關研究與展示。

研究課題為臺灣野生菇類之蒐集研究，以傘菌類、腹菌類為主，臺灣菇類豐富，但研究甚少，建立臺灣野生菇類基本資料，進而結合民間栽培技術，可培養新的食藥用菇供大眾利用，並解說菇類在生態系占有分解者重要一環。另外植物與菇類息息相關，可監測植物健康狀況，提早作防治工作。菇類在植物園可作展示解說之用，如93年舉辦「菇菇饗宴——栽培菇類特展」及「菇菇風情——科博館菇類攝影展」。



珠雞斑白鬼傘



菇菇饗宴——
栽培菇類特展



胡維新

研究助理

主要辦理植物園園區之維護及活體蒐藏業務，92及93年主要加強臺灣原生熱帶種原之蒐集，除提供園區展示所需之外，並利用園區現有物種與鄰近中小學合作進行「臺灣原生稀有物種繁殖復育」研究，所得材料除可供中小學校園建立鄉土植物教學教材園之外，校園亦可作為臺灣原生稀有物種，保存的場所，目前已繁殖一定數量稀有物種，包含：蘭嶼土沉香、蘭嶼海桐、大果厚殼桂、臺灣三角楓、蘭嶼秋海棠、止宮樹等，另外作為一般的校園綠化樹種尚包括：紅楠、香楠、魯花樹、疏脈赤楠、蘭嶼蘋婆、烏柑仔、對面花、臺灣石楠等約 50 種左右的原生植物，本復育計畫目前仍以臺中市中小學為對象，未來將逐步擴及其他縣市。

熱帶物種為本館植物園蒐藏及展示重心，植物園目前配合展示的蒐藏策略雖然兼具物種區外保育的功能，但是受限於面積及管理人力，種類及數量終究會受到一定程度的限制，加上熱帶物種種子保存不易，種子在很短時間即喪失活力，為了達到長期穩定的種原保存，避免基因資源因為各種原因而流失，目前正利用現有園區材料，將種子置入液態氮進行超低溫冷凍保存研究，並配合組織培養技術，在安全、穩定、節省人力與空間的環境下對物種進行長期保存，臺灣白及 (*Bletilla formosana*) 種子的超低溫保存及發芽生長為目前進行之研究。

負責植物園標本室的蒐藏業務，主要蒐藏園區及栽培植物標本，另配合園區苗圃進行活體交換業務，主要以熱帶地區種原為主，交換單位包含國內外植物園或研究機構。

其他工作人員

維管束植物工作室：
林慧美、蔡昱珩、伍雅琳
孢粉實驗室：
趙佩瑛



蘭嶼島上的稀有植物腰果楠
(*Dehaasia incrassata*)

重要蒐藏與研究成果

一、臺大與興大菌類標本捐贈本館

幾年前臺灣大學植物系陳瑞青教授與劉錦惠副教授相繼退休；92 年底，他們多年蒐藏的菌類標本相繼捐贈本館。陳教授為臺灣大型真菌研究的著名學者，在臺大任教了二、三十年，桃李滿天下，門生多服務於國內各學術機構。劉老師專門研究臺灣的黏菌分類，有多篇黏菌學研究報告發表，建立了臺灣黏菌分類的基礎。

陳教授在退休前曾表示他多年累積的標本將捐贈給本館。92 年春，臺大生態所所長謝長富教授有鑒於本館為國家級標本館，具有良好的標本保存環境與制度，且陳教授退休兩年後因健康因素及較少到研究室，願意將該所的真菌標本捐贈本館。當時陳教授在美停留半年，為表尊重陳教授，本館擬向陳教授確認此一捐贈之事。不意，陳教授卻突然於同年 8 月底在家中因心臟病去世。陳教授是中華民國真菌學會創辦人及首任理事長，推動海峽兩岸真菌學會交流，並擔任過亞洲真菌學會理事長。陳教授的離去是臺灣真菌學界一大損失。

92 年底，本館與臺大生態所協商確定後，在本館典藏組人員協助下，將陳教授與其學生所留下之菌類標本運送到本館。經過一年的初步整理，發現這批標本有五萬號以上，但有許多因蟲害或採集資料不完整，日後實際入館蒐藏的並不會太多。之後，退休的劉錦惠老師也捐給本館黏菌標本，初步整理有兩千四百多號，可入館蒐藏的約有一千五百號，它們也是臺灣黏菌標本的代表。

中興大學生命科學系陳昇明教授前年榮退。陳教授在興大任教數十年，作育英才無數，著作等身。陳教授近十年來指導數位研究生調查惠蓀林場大型真菌，並出專書數冊。去年經本館聯繫，陳教授也欣然同意捐贈大型真菌標本給本館，約有三百號。

本館提供良好的管理條件以保存這些捐贈的標本資源，提供相關學者進行研究。往後我們仍將持續聯繫大學或其他機構的學者，歡迎他們捐贈標本給本館，以充分發揮標本館的功能與價值。

二、合作考察或徵集標本及購買植物標本案

(一)92 年 9 月本組委託本館文教基金會和雲南省中甸地區的「香格里拉高山植物園籌建辦」簽訂合作考察「梅里雪山此角莫西山」案，預計 93 年 8 月將有 6,000 份維管束植物標本進館；後因天候因素，所以該籌建辦向委託單位文教基金會申請延期至 94 年 3 月底。目前此委託案已有約 3,700 份標本抵達本館標本館。

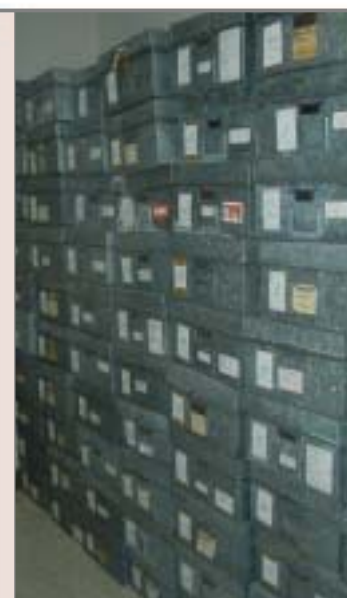
(二)93 年元月和天津自然博物館簽訂徵集天津、河北地區的維管束植物標本，預計將進館 500 份維管束植物標本（至少包含 300 種以上），該批標本將由對方博物館縫製到檯紙上。

(三)93 年元月和大連自然博物館簽訂徵集長白山地區維管束植物標本，預計進館 500 份維管束植物標本（至少包含 300 種以上），該批標本將由對方博物館縫製到檯紙上。

(四)陸續將和北京中國科學院植物所的楊永博士簽訂共同考察內蒙古中西部地區（包括鄂爾多斯地區及阿拉善）；和四川峨眉的彭啟新先生商談共同考察（或徵集）峨嵋山地區維管束植物標本。

三、「花的前世今生」特展、巡迴展及網頁光碟相關成果報導

維管束植物學門策劃「花的前世今生」特展於 91 年展出後，對觀眾提供的科學新知包括：最早的花化石發現、花之源的探索、花的親緣演化關係、花愛紅娘的花色花形花香有趣主題以及登峰造極花之最等，



陳瑞青教授捐贈本館之真菌標本



「花的前世今生」特展



「花的前世今生」
出版品封面

獲得觀眾熱烈的回應。92年「花的前世今生」出版，成為政府出版品銷售排行榜數一數二的暢銷書。其後展示受邀至高雄佛光山藝術館展出，於初春花季開幕，參觀人潮踴躍。接著高苑技術學院自然史教育館、臺南自然史教育館和化石博物館、彰化縣政府臺灣花卉博覽會——花神祭 等陸續邀約巡展。92~93年由南而北展出，協助各單位推廣科學教育，並提供中南部觀眾就近參觀學習，寓教於樂，94~95年預計將於中北部展出。

由於「花的前世今生」相關資料豐富，獲得教育部支持設計規劃相關光碟和網頁，於93年底完成「花的前世今生——首部曲」的網路教學資源(<http://www.nmns.edu.tw/flower/>)，內容分為五大單元：

- (一)基本知識單元：以照片、文字及手繪圖來介紹花的基本構造及相關知識。
- (二)演化館單元：透過花的起源、葉花轉變、多樣花序及傳粉等不同的方式，來介紹花的演化。
- (三)展示館單元：利用3D復原侏羅紀與白堊紀的場景，讓大家瞭解古花古果所生長的環境與樣貌，並介紹現今花花世界的多樣生活與登峰造極。
- (四)趣味館單元：提供相關實驗、繪本故事、遊戲等單元。
- (五)兒童學習館單元：透過深入淺出的動畫，提供兒童基礎學習。

另外，在功能上有「延伸閱讀」、「檢索查詢」、「網站導覽」、「留言版」及結合數位典藏資料庫的「花的數位典藏」單元，期待透過這樣的教學資源，能輔助老師在課堂上的教學活動，也讓小朋友自動自發地去學習與觀察這個花花世界，並提供大眾一個豐富的百科網站，希望能帶給更多喜愛者深入淺出的探索和互動。

四、植物園研究成果

植物園開園以來，多數植物已長成材，因為臺中市內寸土寸金，先天環境已框住了本館植物園的特性，然而先天環境有其約制力，只要跳脫空間的思維，我們就海闊天空了，而讓本園的蒐藏更多樣化就不是空想了。這兩年來，我們伸出親善之手，積極尋求合作伙伴，共同保存、照料特殊的植物活體蒐藏，幾度協商之後，有數個單位願意與我們攜手合作，已簽訂合作協議書的單位有臺大實驗林管理處、臺大山地實驗農場、種苗改良繁殖場、臺中區農業改良場、杉林溪遊覽事業公司等，合作的項目說明如下：

藥用植物方面：本館過去已收集約500種藥用植物，這期間，並分送至臺大實驗林管理處和社營林區、新社種苗改良繁殖場、臺中區農業改良場埔里分場、杉林溪遊樂區等地，以達分散保存風險的目的。目前種苗改良繁殖場有豐富的香藥草類的蒐集，杉林溪正發展中海拔地區的藥用植物，臺中區農業改良場則朝向美國重要藥用植物的蒐集等，實質上也是雙方共同努力的成果。

蕨類植物：本館收集二百多種臺灣原生的蕨類外，策略上則結合不同海拔高度地區的單位，共同建立完整的臺灣蕨類蒐集。在這二年內，本館已協助臺大實驗林管理處建立溪頭蕨類植物園，保存約160種蕨類；協助鳳凰茶園，建立蕨類植物教材園。另外，在臺大梅峰山地農場也收集了約160種臺灣中高海拔的蕨類。將來再結合種苗改良繁殖場的栽培及繁殖技術，一定可以使蕨類園的建立更上一層樓。

竹類植物：臺大實驗林溪頭營林區早已建立竹類植物活體蒐集，並設立竹類標本園，加上本館的努力，共蒐集60種竹類植物。這段期間，曾協助辦理竹藝文化節，規劃竹類生態展及解說員教育訓練。另外，並協助竹山地區青竹竹藝文化園區有關竹類標本



植物園熱帶雨林溫室

鑑定、提供解說牌資料，以及解說員教育訓練。又曾協助瑞竹竹類標本園之解說活動，提供中興大學農藝研究所碩士班學生新鮮竹類研究材料。

天南星科植物：天南星科植物是熱帶雨林重要植物，是本館熱帶雨林溫室蒐集的展示重點之一。本合作對象為新社種苗繁殖場，該場曾在天南星科觀賞植物的品種下過功夫，擁有超過100個品種。去年，本館協助蒐集臺灣原生的天南星科植物20種，未來將在國外物種的蒐集上繼續合作。

種子庫：全世界有將近30萬種的種子植物，有些高達50公尺、重達數十噸，有的只是幾公分高的小草本；種子植物不一定只靠光合作用獲得養分，有些種類會進行腐生、寄生，甚至捕捉蟲子為生。

這些形形色色的種子植物，在生態系上一直扮演著舉足輕重的角色，是維持環境平衡的重要環節；但由於人類活動頻繁，過度開發土地，已直接或間接影響生長在該地之原生植物的生存。

臺灣地狹人稠，公路發達，自然生態的維持不容易，原生植物受到的干擾日漸惡化。臺灣的原生種子植物有三千四百多種，其中約有1,000種為特有種，目前農委會之林業試驗所與霧峰種原中心等正針對臺灣原生植物進行種子活體收藏，已有相當好的成果。林業試驗所主要以林木種原收集為對象，後者則在原生植物部分與特有生物保育中心合作，著有佳績。

基於物種保育及科學研究，本館植物園於民國93年成立植物種原庫，蒐藏維管束植物之活體、種子等新鮮組織；除蒐藏研究之外，也保存了物種之大量遺傳基質，可提供生態復育之所需，以竟保育及永續利用之功。

種原庫的近程目標，是收集臺灣原生植物之活體及種子，已設立有效容積達18,000公升之微電腦恆溫恆溼室，以低溫低溼環境長期保存種子的活性。未來期能透過採集、捐贈、交換等，擴大種原庫規模，提供保育及研究之需。



長枝竹



逆羽裡白

92~93年發表著作

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阿里山根節蘭





>>地質學組

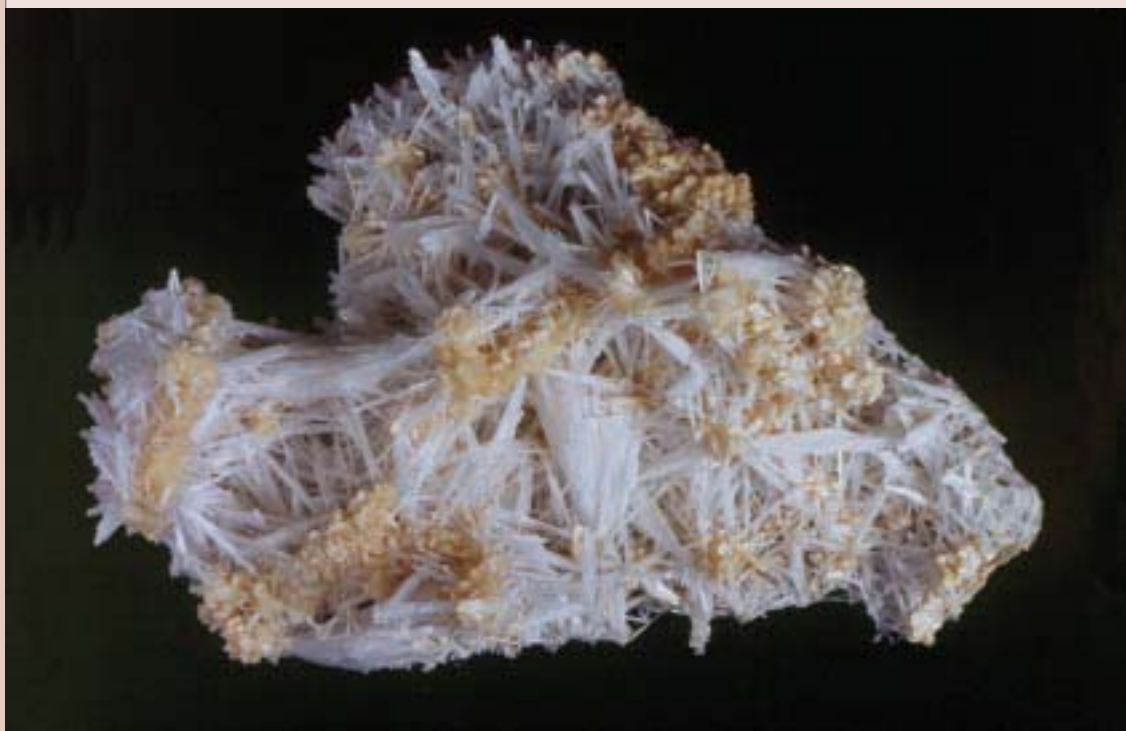


長毛猛犸象成體骨架
(張介宇攝)

本組主要肩負地質學標本與資料之蒐集、製作、研究、鑑定及保存，同時支援地質相關的科學教育與展示活動的推廣與展演。為落實業務的推動與執行，組內分為岩礦與古生物兩個學門。目前全組共有8位研究人員、2位約聘技術員、2位技工和5位計畫助理。此外，本組還敦聘胡忠恆教授、楊宏儀教授、陳汝勤教授、戴昌鳳教授為研究客座，以借重他們的長才，提供本組在蒐藏、研究及籌建地質廳等方面之諮詢與建議。又因標本之處理、登錄、入庫與資料建檔需要大量人力，乃透過科學教育組對外徵募27位義工，協助相關事務的推展。

地質學組主要蒐藏與地球組成、環境變遷及生物演化有關之標本，舉凡礦物、岩石、沉積構造、脊椎動物化石、無脊椎動物化石、微體化石、植物化石、地質鑽探岩心等都是蒐藏的對象。這些標本記錄地球的演變過程，也對地球上的生物從產生、演化，甚至滅絕，留下不可或缺的佐證材料。我們致力於這些珍

貴自然物的收藏與保存，初期以臺灣及離島地區為首要標的，然後再依收藏品之價值（學術的、展示的、教育的）與特性，擴及大陸及世界各地。在系列典藏品中，以實體標本為主，各類相關之模型、幻燈片、數位影像、岩石及化石薄片、重要參考文獻（與典藏品相關者）為輔，而為了展示、教育、研究及比對需要，重要現生脊椎動物骨骼亦列入收藏範圍。標本的蒐藏除了本組同仁親赴野外採集外，部分極具地質意義的重要標本，則以購買方式取得，然而值得一提的是，兩年來我們與館外學者及業餘人士積極連繫，並獲捐大批地質標本，增進不少館藏。截至目前為止，



礦物標本蒐藏——產於印度的
鈣沸石和輝沸石

中國貴州三疊紀地層發現的魚龍化石



各類地質標本的收藏數量已達三萬九千五百餘件，已成為國內地質標本最具規模的蒐藏重鎮。

大量收集地質標本，除了用於相關展示與科學教育外，最主要是作為研究的基礎，因此，本組同仁在擬定蒐藏方向與目標的同時，也進行相關研究的規劃。近兩年來，本組重要的研究範疇包括：(一)中生代海棲爬行動物群研究；(二)華南及臺澎地區橄欖岩包體的微量元素地球化學研究；(三)南澳源頭山及金門片麻岩之地球化學、年代學與大地構造對比研究；(四)南沙群島新第三紀晚期碳酸鹽中的白雲化作用；(五)東亞地區第四紀真象科系統分類與演化之研究；(六)臺灣西南部更新世化石珊瑚礁最初發育機制之研究；(七)臺灣西南部更新世冷泉碳酸鹽岩有孔蟲化石

研究；(八)大陸阿拉善地區前寒武紀基底變質沈積岩之鋇 - 釷同位素及鋯石鈾 - 鉛定年學研究。各項研究計畫所需經費有的是本館年度編列、有的是執行國科會專題計畫、部分為石油基金所資助，而計畫的執行除組內研究人力與設備的運用外，還與臺灣大學、成功大學、中央地質調查所、中油公司探採研究所等國內研究單位，以及世界其他地區之博物館及研究機構，例如：加拿大國家博物館、加拿大阿爾伯托大學、美國卡內基博物館、英國倫敦大學、中國地科院地質研究所等進行合作交流，並獲得具體的研究成果，這些成果也分別在Nature、Science、Chemical Geology等國際重要學術期刊發表。

為配合博物館業務發展需要，本組同仁也積極參



寶石特展一隅

與、支援與地質科學相關的各項教育活動，例如：地球科學劇場教室教案開發、自然學友之家系列演講、現場解說人員教育訓練、自然之旅地質研習、科普文章及書籍撰寫等。而鑑於博物館為公共事業的一環，應用電腦資訊技術，將典藏品以數位化媒體呈現，達到資源共享與知識推廣的目的，為現今世界的一股潮流。本組為體現此一時代使命，在國科會大力資助下，也致力於發展地質典藏品的數位化工作。此項為期5年的「數位典藏國家型科技計畫」，經由本組同仁3年來的努力，已先後完成了脊椎動物化石、礦物、無脊椎動物化石及火成岩等子計畫，並將典藏品數位化的成果推上網路，這些典藏品經過系統性的分類、數位影像的建立和相關背景知識的詮釋，使用者只需透過網際網路，便能立即瀏覽，使得博物館典藏品的利用和相關知識的傳達，得以無限寬廣的延伸。而這些數位化資源，也將為博物館的地質典藏品創造出更多、更廣的潛在應用價值。未來兩年，我們將持續執行變質岩、沈積岩、微體化石、植物化石及地質鑽探岩心等典藏品的數位化工作，為建構以「知識管理」與「資訊傳播」為功能導向的數位博物館而努力。

籌設地質廳為教育部社教機構服務升級計畫中本館推動的一項重要計畫，本規劃案結合本館地質標本收藏之內容與特色，將以現有地球環境廳的一樓及地下一樓之展示空間，重新規劃出礦物廳、變動地球廳及古生物化石廳等三大展示主題，每大主題有其各自的展示內涵，而彼此又可相互連貫與呼應。地質廳將以實體標本為主，並輔以文字、模型、影像等圖說，規劃出具有特色的展示。此項籌設工作由本組負責展示內容規劃與展品選購，展示組負責展場規劃、設計與製作，科學教育組研擬相關教育活動的推出。未來此一展廳工程的完成，將是臺灣第一座主題式「地質廳」的常設展示，而經由地球科學的整合性思維，透析地球組成、環境變遷與生物演化的互動共生依存關

係，使觀眾能夠更進一層探詢大自然的奧秘，以及重新思考生物演化與自然環境間協同合作的真義，將可提供國人作為終身學習、社區教育及地球科學戶外教學的絕佳場所。此外，近年來本組同仁也策劃或參與幾項重要的特展及展演活動，包括「魚龍清修活動」、「飛天恐龍特展」、「寶石展」、「土桑礦物化石展」、「水晶展」、「科學週——形的特展」等，並參與九二一地震教育園區「地震影像館」及「斷層保存館」展示規劃設計案之修正與審查。

在國外各大自然史博物館中，地質領域的蒐藏、研究與相關教育及展示占有相當重要的地位。本館雖是一座年輕的博物館，但是我們已建立良好的制度，並作了整體發展的規劃，蒐藏研究區的硬體建設也大致完成，展望未來，我們仍應更積極開拓館外資源，尋求合作管道，如何大幅增進地質館藏，並提昇研究水準，實為本組同仁共同努力的目標。



中華古果



寶石蒐藏——產於緬甸的星光紅寶(張介宇攝)

古生物學門

程延年

研究員兼古生物學門負責人

在博物館高瞻遠矚的大策略指引下，本館研究人員承襲最高領導群所擬定的蒐藏研究展示與科學教育方針，努力達成既定策略與目標，以爭取本館最高榮耀，並朝向永續經營可長可久的目標邁進。過去二年，蒐藏研究方向針對本館「地質廳」永久展示，搜尋重要標本物件，尤其焦點集中於新生代古象化石群與中生代海棲爬行動物群，建立系統標本，同時持續

進行雙弓類爬行動物群研究。這二年，與國際合作推動中生代三疊紀中期至侏羅紀晚期古特提斯海東緣海陸變遷與動物群更替事件研究，獲得初步的進展。針對雙弓類群中蜥鱗類群裡的腫肋龍類群家族，進行個體發生與系譜關係研究，以及針對祖龍類群中三疊紀中期祖先型新屬種個體分析，並針對白堊紀晚期恐龍生殖策略加以分析了解。





王士偉

助理研究員兼岩心蒐藏經理

自80年進入本館任助理研究員一職至今，主要從事古生物學標本之蒐藏管理作業，於92年5月業務重點調整為兼任鑽探岩心標本蒐藏經理。

蒐藏工作內容包括岩心蒐藏空間維護、蒐藏架與岩心箱標示全部逐步更新、岩心標本登錄、清點、儲位調整、配合典藏組年度盤點，以及整理建立標本原始資料檔與數位影像資料庫等，但另一方面仍持續協助古生物與沉積岩標本之採集與登錄工作。

科教與展示活動的支援，包括撰寫本館簡訊、自然學友之家地質講座專題講演、劇場影片中文譯稿修訂、支援館內舉辦科教活動之野外教學、接受自然學友之家轉來化石標本請求鑑定、電話諮詢與書面答覆、參與協助「地質廳規劃」相關業務，以及執行92、93年度國家典藏數位化計畫地質學子計畫之無脊椎動物化石分項計畫等工作。

學術專業主要興趣為新生代化石珊瑚礁與造礁生物之探討，近年來持續與臺灣大學海洋研究所戴昌鳳教授共同進行高雄大崗山、小崗山與半屏山更新世化石珊瑚礁的礁體最初發育模式研究；另外，在化石珊瑚礁的研究中，首次辨識出「冷泉碳酸鹽岩」(cold-seep carbonates)，因此也對臺灣地區冷泉碳酸鹽岩及其所含無脊椎動物化石進行廣泛的調查與採集；這些研究目前都還在進行中，未來也有更多由此衍生的研究題目，將與館內、外相關學者合作，以進行更深入的探討。





土桑展



飛天恐龍特展

單希瑛

助理研究員兼古生物蒐藏經理

近年來，古生物學門在蒐藏方面，主要係針對館藏的不足以及未來展示的需要，致力蒐尋一些重要的大型展示級標本；在此原則下，本學門兩年內新進了數批重大標本，首先是92年初購置的中國貴州三疊紀魚龍一件，該標本長達5公尺，種屬待描述，在展示及研究上均極具價值；接著於92年終購置4件恐龍化石，包括特暴龍頭骨、甲龍頭骨、竊蛋龍群體埋藏及小暴龍全身骨架共4件，目前已安置館內恐龍廳展示；93年初於美國土桑購置的重要標本有顧氏小盜龍石板埋藏化石及滄龍頭骨，前者為知名的「四翼恐龍」，牠的發現對於飛行起源的探討，有重大意義；後者為白堊紀末期的巨型海生爬行動物，與現今的蜥

蜴同屬有鱗目，單其頭骨便達一公尺多，極具展示可看性；93年末分別購入了古象化石3件、德國侏羅紀海生爬行動物2件、中國貴州三疊紀海生爬行動物2件及德國侏羅紀海百合1件，每一件均是展示精品，其中來自德國的魚龍腹中尚懷有兩隻小魚龍，相當難得。另外值得一提的是臺大地質系捐贈本館軟體動物化石一千餘件，且大多均已鑑定，在科教及研究比對上深具價值。

在科教及展示方面，近兩年參與支援的工作包括暑期野外自然探索活動、魚龍修復展演、新進化石精品展示、「飛天恐龍」特展、土桑展，及翻譯科普書籍「當三葉蟲統治世界」一書。



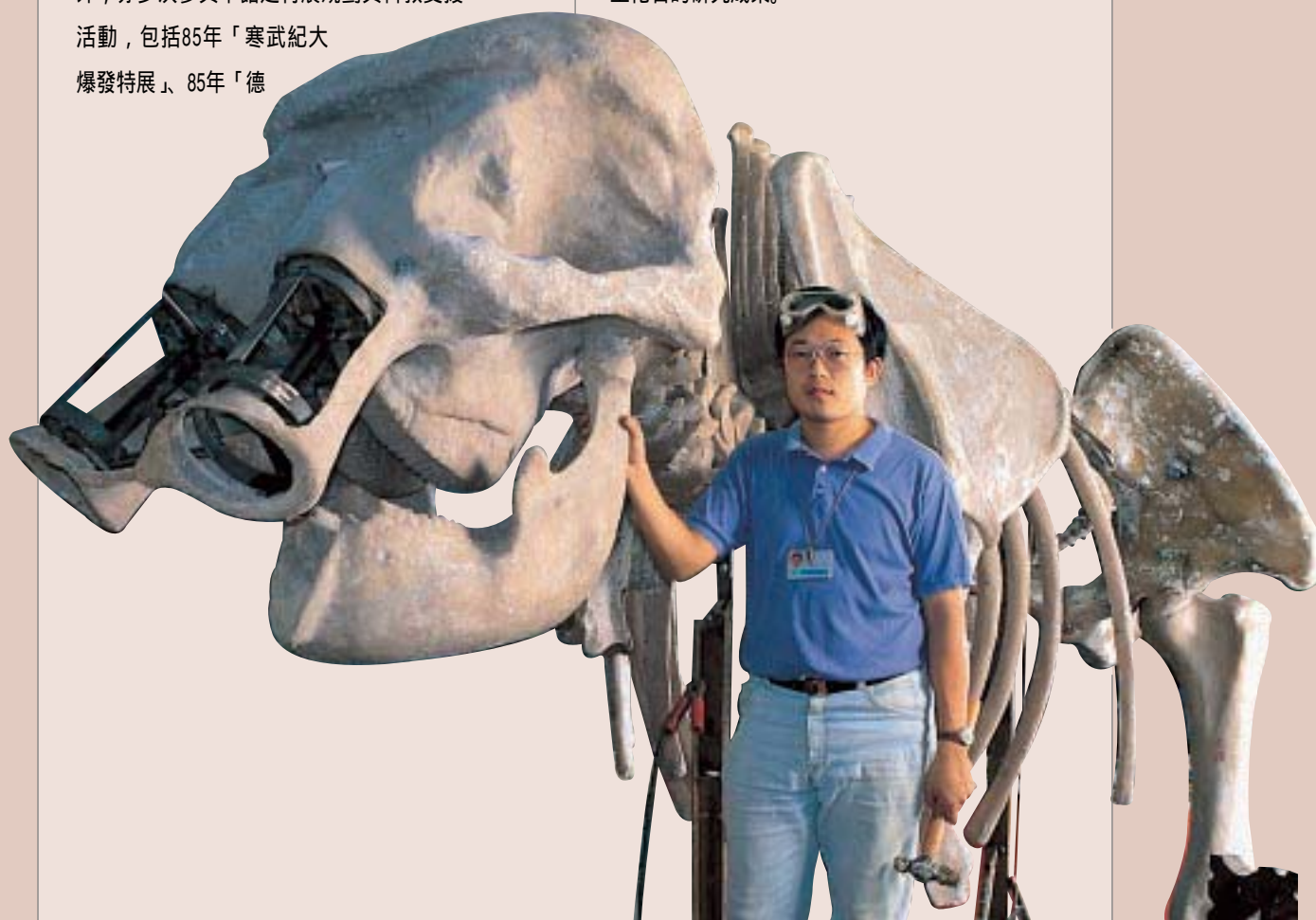
新進館的魚龍化石

張鈞翔

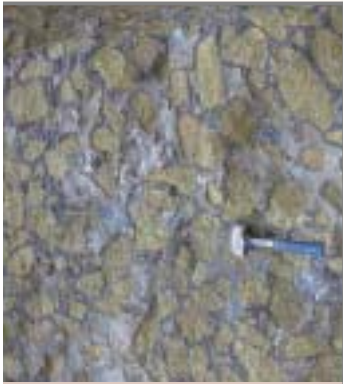
助理研究員

於82年入館服務，主要的任務在於脊椎動物化石的蒐藏與研究，包括化石之野外採集與修理維護、古脊椎動物工作室之管理、國內外重要化石標本之購藏作業、洽辦與其他單位或個人化石標本捐贈轉移事宜、民間動物園及私人捐贈之大型哺乳動物骨骼之挖掘與處理。個人的研究主要針對遠東地區第四紀真象科化石，進行系統性的生物地層、演化分類與古生態環境之研究，以及哺乳動物之型態與結構特徵之研究。同時，也與中國大陸、日本、英國等相關研究單位，進行哺乳動物化石之合作研究。專業研究工作之外，亦多次參與本館之特展規劃與科教支援活動，包括85年「寒武紀大爆發特展」、85年「德

氏水牛與古菱齒象特展」、87年「虎年特展」、87年「龜展」、87年「瀝青坑的寶藏特展」、87年「科學探索『恐龍與鳥的恩恩怨怨』特展」、89年「與龍共舞特展」、90年「南美滅絕巨獸特展」。並參與籌劃研議劇場教室教案與展示現場解說教案（86年地球科學教室「從化石看哺乳動物特徵」、88年「從化石看大象的特徵與演化」、91年「足下風雲——哺乳動物的行走模式」、93年「澎湖古菱齒象實物探索」、94年「腐食？掠食？霸王龍」）。未來將更致力於古脊椎化石之專業研究，並促進國際館際間之學術交流與合作，期以提昇臺灣本土化石的研究成果。



岩礦學門



橄欖岩包體

何恭算

副研究員兼岩礦學門負責人、兼地質學組主任

這兩年主要從事橄欖岩包體的微量元素研究，以探討華南及臺澎地區上部地函的岩石組成、礦物化性和深部地質作用，此項計畫獲得國科會的經費支持，並與成功大學地球科學研究所游鎮烽教授合作。在標本蒐藏方面主要採集澎湖群島及新竹地區的橄欖岩、輝石岩及粒變岩等包體，並於 93 年赴大陸華北及內蒙古一帶進行火山岩的調查採集，這也是個人持續對亞洲東緣新生代火山岩研究的一部分，藉由系列火山岩標本的收集，同時對該區火山活動之噴發年代、化學特性、引發機制以及岩漿源區之地化特性，作系統性的分析與探討。

個人除了兼任組主任負責組內行政事務外，也參與本館舉辦自然之旅地質研習、自然學友之家通俗地質演講、撰寫通俗文章、書籍，並在東海大學通識中心授課，為推廣地質科學教育盡一份心力。本館於 93 年為執行服務升級計畫積極籌設地質展示廳並獲得經



輝石岩

費補助，讓本組有機會添購許多彌足珍貴的地質展品，厚實本館館藏。個人負責地質廳中礦物展示內容的建構，並分別於 93 及 94 年與本組同仁前往美國土桑添購大批展示所需礦物標本。

地質典藏品數位化乃是本館執行國科會國家型科技計畫之一，個人負責礦物分項計畫，同時擔任地質主題小組召集人，擬定數位化作業之共通欄位和工作方針，為同屬地質領域之機構間搭起溝通平臺。



火山錐

莊文星

研究員

研究重點主要針對海峽兩岸中生代燕山造山運動中酸性深成岩的研究，包括：(一)蘭嶼安山岩中之花崗岩包體；(二)臺灣中央山脈變質岩區花崗岩及花崗片麻岩；(三)金門花崗岩；(四)馬祖中酸性深成岩等不同構造區花崗岩類岩石之地球化學、岩石學與同位素定年研究，期能對不同構造區之成因與構造有所了解。目前已完成蘭嶼、南澳源頭山及金門花崗岩之探討研究，其中金門鹼性花崗岩與蘭嶼花崗岩包體為重大的突破與發現。

93年執行數位典藏岩石學(火成岩)子計畫，於海岸山脈發現了典型的火山岩頸柱狀節理構造，對於臺灣東部火山區(海岸山脈、蘭嶼及綠島)火山頸地質地形景觀建立一套完整的模式，並敦請東海岸風景區管



理處協調成立臺東大峰峰地區之火山頸地景保護區。攸關火山岩之柱狀節理，亦於93年「形的特展」中展出。



臺東大峰峰百褶裙式塔狀柱狀節理，為火山頸典型之代表。



宮守業

副研究員

92~93這兩年在研究工作方面，主要從事兩項研究，一是南沙群島太平島的白雲石化作用，這是以往太平島碳酸鹽研究的延續。研究發現太平島碳酸鹽和其他一些島嶼碳酸鹽的白雲石化作用都在早更新世中止，其中的地質意義耐人尋味。另一項是剛開始的「無氧環境下碳氫化合物引發的碳酸鹽膠結」，這是一個很新的研究領域，也是國際上很熱門的研究領域，因為研究成果可能對早期地球大氣層與生物的演化，以及火星上有沒有生物的問題有所啟發。

在標本收藏方面，採集將近兩百件澎湖淺海底棲生物標本交由動物組收藏；隨同何恭算主任前往美國土桑購買礦物標本一批；接洽了一批火星、月球隕石標本的購藏；接洽、整理由中央大學捐贈滄波教授遺留的岩石、礦物、薄片標本七百多件、日據時期地質圖54件和地質文獻一批。顏教授的遺贈尤其彌足珍貴。

在科普工作方面，參與地震園區斷層館和影像館的常設展，以及正開始的地質廳「變動的地球」常設展規劃。另外參與了兩次在溪頭舉行的高中生自然研習營活動。

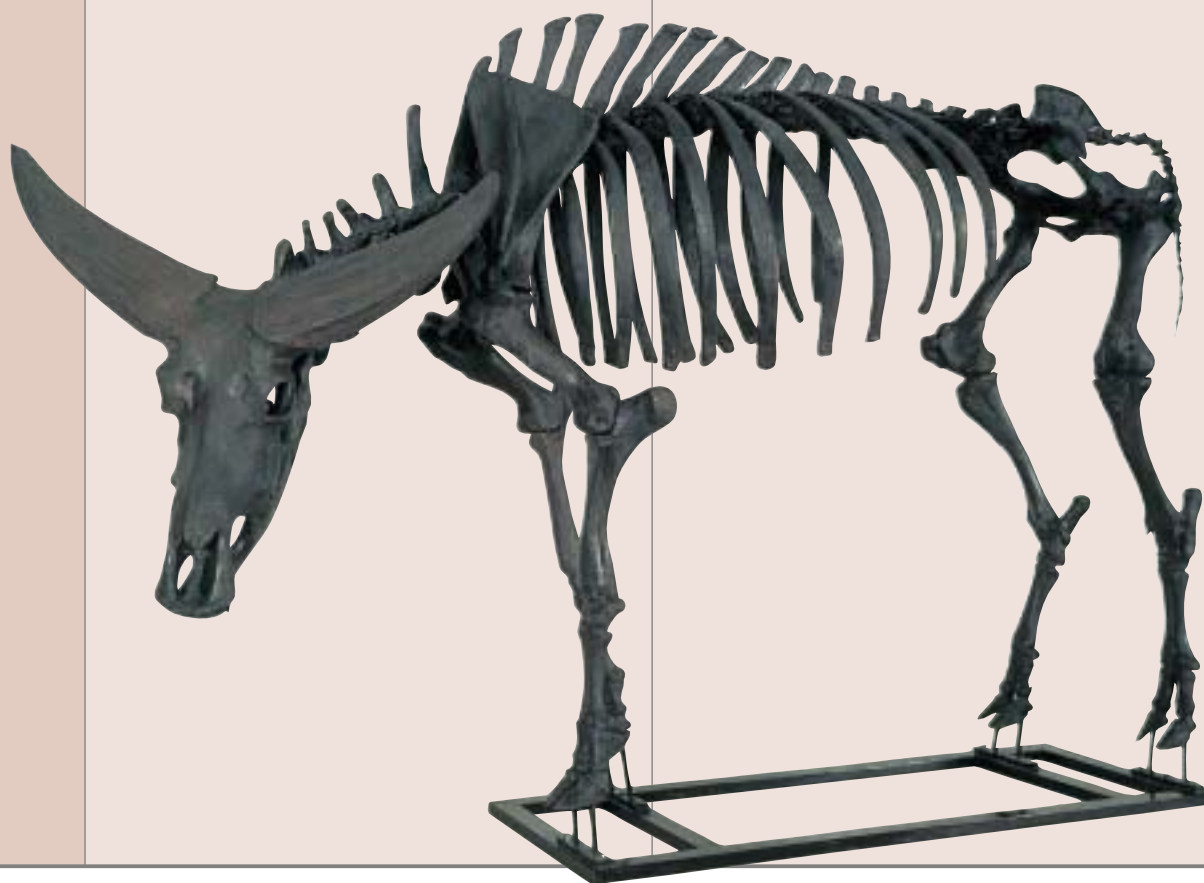


董國安

研究助理兼岩礦蒐藏經理

持續之前參加國科會大型整合計畫——中國大陸西北祁連山地區變質作用、岩漿活動之研究。經由參與國科會研究之便，有系統採集青藏高原北部前寒武紀岩石標本，並經由完整研究投稿於國際知名期刊，除可提昇標本蒐藏質量，並可藉由期刊出版提高本館國際知名度。

另建立地質影像圖庫，分類包括：(一)岩石與礦物，(二)化石古生物，(三)地形、地質構造等與地質相關之影像，並予以數位化，以作為地質學組相關標本影像收藏之用。

**其他工作人員**

約聘技術員：

胡少康(SEM室)

鍾坤煒(岩石磨片室)

技工：葉秋榮、莊銀明

計畫助理：

陳淑娟、邱梅欣(國科會)

洪誌橋、巫佳才、紀建梅

(數位典藏)

重要蒐藏與研究成果



胡氏貴州龍懷孕標本及其細部構造解剖圖

貴州龍



一、重要地質研究成果

「驚蟄，二億三千萬年前懷孕的母親：

三疊紀海棲爬行動物(貴州龍)產下活的幼體(胎生)。

最終，真象大白——懷孕的爬行動物描繪出史前生產的圖像。

兩件極為罕見的中生代化石，懷孕的海棲爬行動物，珍藏於國立自然科學博物館，證實了這一類的海棲爬行動物產下活生生的幼體(即通稱的胎生行為)——最終，古生物學家否定了牠們上岸產卵的任何可能性。這兩件學名為胡氏貴州龍(*Keichousaurus hui*)的化石演化出一個活動自如的骨盤構造，有利於產下活的幼體。每一件化石標本保存著4到6隻不等的腹中胎兒。

這個發現代表著在「蜥鱗類群(sauroptrygians，包括了我們所熟悉的魚龍與蛇頸龍等)」中，首次發表直接的證據闡明生產策略與方式。在地質史過去的海棲爬行動物中，蜥鱗類群構成了最大群、也是最多樣性的，牠們存活於二億五千萬年前到六千五百萬年前，

幾乎橫跨整個中生代時期。雖然回溯到1821年，最早描述第一隻蛇頸龍 *Plesiosaurus* 以來，成千的標本已經發掘自全球各處(包括中國著名的中生代地層)，但是除了魚龍類(ichthyosaurs, 1846)與滄龍類(mosasauroids, 2001)而外，沒有任何直接證據闡明所有蜥鱗類群的海棲動物到底是像海龜一樣上陸靠近岸邊產卵生子(oviparity, 卵生)? 或者是在水中產下活的幼子(viviparity, 胎生)? 雖然

針對蛇頸龍、腫肋龍(包括本研究所描述的貴州龍)與幻龍類群，不同學者分別提出胎生的假說與臆測，到目前為止依然缺少直接有力的證據。

本研究報導發掘自中國貴州省興義地區(法朗組竹桿坡段石灰岩，中三疊紀晚期，大約距今2.3億年前)兩件胡氏貴州龍(*Keichousaurus hui* Young, 1958)懷孕的標本(標本號分別為NMNS-cyn2002-01與NMNS-VL191)。這些標本保存極為細緻，不僅僅提供了首次驗證蜥鱗類群無疑的生殖方式證據(即水中產下活的幼子，胎生)，同時首次區別出蜥鱗類群化石的雙型性(即雌、雄體的特徵辨識)。同時更進一步，我們可以推論出在腫肋龍類群(pachypleurosaurs)中，一個活動自如的骨盤腔(pelvis，即荐椎與腰帶構成)之演化存在，指示了胎生的可能生殖方式。由此引申推斷，其他的蜥鱗類群生物與中生代多樣性的海棲爬行動物，具有一個活動自如(可伸縮移置)的骨盤腔，也可以藉此判定其生殖方式。這種動物演化出的解剖構造型式，有助於牠們在危險的海洋環境中，儘可能快速產下幼子，達成子嗣承襲的優勢。

本組程延年博士與加拿大渥太華國家博物館吳肖春博士及北京中國地質科學院季強博士共同研究這兩件珍稀的標本，並於2004年11月的「自然」(Nature)第432期發表。這兩件珍貴標本其中一件係經過程博士3個月精心修復而顯露出腹中幼體胚胎；另外一件則是借自位於臺北板橋的石尚礦物化石博物館，概允提供作為研究材料。經過仔細研究，大部分腹中胚胎呈現不正常體位——頭朝後方而非前方——古生物學家認定雌體的母親是在生產期間由於難產而死亡的。

為什麼這群爬行動物重新下海？牠們如何在水域中移行(locomotion)？牠們如何覓食？牠們如何生殖、育子與成長？牠們是溫血(內溫型，endothermic)動物嗎？蜥鱗類群整體家族滅絕的原因為何？這一連串的謎底仍有待釐清。

二、經由捐贈取得之重要岩礦標本

本館地質標本的來源有組內同仁的採集、向國內外標本商人購置，其中不乏是由熱心人士的捐贈，包括大學教授、業餘愛好者、在校學生或是一般民眾。在過去兩年以來，本館受贈的地質標本高達四千餘件，對本館館藏幫助甚巨，對於他們熱情的贊助，我們謹致最高的謝意。在諸多捐贈案例中，我們列舉一二說明如後：

(一)陳汝勤教授捐贈案

93年6月本組何恭算博士接獲陳教授來電表明願意將畢生收集的地質標本、學術期刊、論文書籍捐贈給本館，這也是繼92年之後，又一次慷慨解囊。

陳教授以地球化學、海洋地質及岩石學見長，可說是國內地質界及海洋界的大老。自美學成歸國後，隨即在臺灣大學海洋研究所任教，作育無數英才，並曾擔任該所所長及中國地質學會理事長等職，治學嚴謹，誠懇待人，為後進晚輩樹立了良好的典範。

在這兩年期間，陳教授共捐贈國內外重要岩礦、沈積物、深海錳核之標本、粉末及薄片五百六十餘件，地質論文及圖書期刊共八百餘冊，而這一箱箱捐贈物品都是陳教授多次自費雇車搬運到本館，本館對其誠意至表敬佩。在這一系列標本中，計有臺灣及離島和日本海、菲律賓海的安山岩和玄武岩、金門馬祖地區的花崗岩、臺灣附近淺海至深海沈積物，部分為國外重要的岩礦標本（如：南極地函橄欖岩包體等），而深海錳核更是彌足珍貴。

陳教授是首開國內研究錳核之先鋒，深海錳核乃是一種富含錳、鐵、鈷、鎳、銅、鉛、鋁、鈾、鈦等金屬的團塊，由於這些金屬元素在工業上是相當重要的合金材料，所以在金屬需求量大增的現今科技時代，錳核被視為一項重要的礦產資源而倍受矚目。我國第一艘從事海洋探勘的研究船九連號，曾在臺灣東



陳汝勤教授捐贈之
深海錳核

部之菲律賓海水深達 2,900 及 5,700 公尺兩個測站採得大小約10~20公分的錳核標本，這些標本經過陳教授及其指導學生做過有關礦物組成、化學特性、生長速率等方面的詳細研究，並有多篇學術論文發表。

陳教授為何博士的論文指導老師，過去一直與本組岩礦學門有相當密切的研究合作關係，這兩年更慷慨捐珍貴標本，以及多種重要而完整的地質期刊，供本館作永久典藏。我們在感激之餘，也將讓這些共同的資產做妥善保管並善加利用，以嘉惠廣大的莘莘學子及社會大眾。

(二)顏滄波教授捐贈案

93年春天，中央大學的馬國鳳教授提起，中大地球物理所還留著一批顏滄波老師留下來的標本和文獻，問本館有沒有興趣接收，本館欣然答應。

顏先生是地質學界的老前輩，對臺灣火成岩、變質岩和金屬礦床的野外調查方面尤其貢獻至大，而且顏先生從日據時代就開始從事地質研究，他的遺物必有可觀之處。本組宮守業博士和王士偉君，在 93 年 4 月間，花了兩天時間，才清理完。

顏先生留下的礦物、岩石和薄片標本總共有七百多件，其中有很多重要而目前很難再採到的標本，例



顏老師率領的地質調查隊在天池的合影留念。我們在顏老師的遺物中找到這張相片。

如：瑞芳和金瓜石的天然金、綠島的堇青石、新竹關西的鈷石等標本，還有本館本來沒有的的韓國、日本金屬礦物標本。

此外，顏先生的遺物中還有54幅保存完好的日據時期繪製的地質圖，可說是臺灣地質學史的珍貴文獻。這些圖幅現存者多半因為使用的關係而保存不佳，而顏先生保存的這批地質圖幾乎如新，可能是現存最完整、狀況最好的一批早期臺灣地質圖。

非常可惜的是，有為數甚多的未發表手稿和工作圖幅，包括部分標本的標籤，其中的註記、符號已不能完全了解其意義。相信其中有很多顏先生的觀察和思考，竟未能為後人所知。這件事也可以給我們後輩一些啟示——及早把自己的研究紀錄整理清楚放在適當的場所，成為人類共有的資產，否則數十年之功，不能傳承下去，豈無憾乎？中央大學捐贈這些標本給本館，某種程度上讓這樣的遺憾不再繼續擴大，這一點要特別感謝中央大學。

(三)楊宏儀教授捐贈案

楊宏儀教授為國內知名的岩石學家，自美國俄亥俄州州立大學獲得博士學位後，便任教於成功大學地球科學系三十餘年，於93年1月31日榮退。在其數十年教學及研究生涯中，主要從事岩石學、地球化學及耐火材料等方面的研究，近年來主持國科會大型整合計畫——祁連縫合帶火成岩與變質岩之礦物學研究，對臺灣岩石及礦物領域的發展貢獻卓著。

楊教授在退休前一、兩年即親自著手整理研究用的岩礦標本千餘件，並悉數慨捐本館典藏。這些標本除了臺灣、澎湖地區火成岩外，還包括韓國忠北、京畿、釜山地區礦物標本；加拿大輝鉬礦；美國聖海倫斯火山灰；菲律賓Zambales鎢鐵礦等，每件標本之學名、野外編號、採集地點等基本資料都是楊教授親自撰寫、校對而成，其中哪些標本已經研究過或是由哪位研究生分析實驗都寫得相當清楚，由此可見楊教授對於研究標本的重視，這也充分表現出他在治學與研究一貫的嚴謹態度，實為我輩效法的最佳典範。



楊宏儀教授捐贈之韓國礦物標本

三、經由購買取得之重要化石標本

本組近兩年(92~93)陸續購藏了一些精彩的大型展示級古生物標本。首先入館的是於92年初購置的魚龍化石，本件產於中國貴州興義的三疊紀地層，屬於早期的混魚龍類，種屬待描述，深具研究價值；該標本購入之初為原始埋藏石板，有待清修復原，本館為讓民眾能趁此機會實地了解化石標本的修復與處理，特別在展場闢出一角，展演此一清修復原工程，為時3個月，獲得參觀民眾的歡迎；清修之後的標本主體浮現於石板上，頭部立體伸出石板，全長達410公分，高230公分，極具可看性。92年古生物蒐藏的另一個重大進展為4件恐龍化石的購置，包括了特暴龍頭骨、甲龍頭骨、竊蛋龍群體埋藏及小暴龍

全身骨架，4件均來自蒙古的白堊紀地層，其中的甲龍及小暴龍應為新種屬，有待專業人員研究。竊蛋龍群體埋藏展現了該類動物生前親子群聚的互動關係，在恐龍的行為學研究上別具意義，目前這4件標本均已在本館恐龍廳展出。

93年初在教育部社教機構服務升級計畫的經費支持下，本組派員前往美國土桑礦物化石展購置未來地質廳展示所需的標本，此行最重大的收穫是購得一件保存良好的顧氏小盜龍標本，顧氏小盜龍即為92年1月登上《自然》雜誌封面的「四翼恐龍」，它是繼發現「帶毛恐龍」之後，古生物學上的另一個大驚奇。顧氏小盜龍生活在距今一億兩千五百萬年前的白堊紀早期，這種恐龍渾身披著羽毛，最奇特的是，牠的四肢都長著現代型的飛羽，此一發現讓鳥類飛行起源之謎的探索有了重大的進展。關於鳥類是如何進化出飛行能力的？有兩派不同的假說：一是「樹棲說」，這一派主張鳥類的祖先為樹棲動物，牠們透過在林間的滑翔，慢慢演化出飛行能力。支持「樹棲說」的學者更

進一步推測鳥類在飛行能力的演化中，曾出現過渡的四翼階段。另一派為「地棲說」，這派假說認為鳥類的祖先生活在地上，牠們透過高速的奔跑拍翅，最後終於飛上了天空；顧氏小盜龍的發現為「樹棲說」提供了有力的佐證。土桑行的另一重大收穫是購置了一具滄龍頭骨化石，滄龍是白堊紀末期的巨型海生爬行動物，與現今的蜥蜴同屬有鱗目，本件頭骨長達1.2公尺，其上顎兩排翼骨齒的特殊構造，極具展示可看性。

93年末為籌建地質展示廳需要，本組再購入3批精品化石，首先購得的是3件古象，包括長毛猛犸象幼體和成體各一具，以及一具鏟齒象全身骨架。長毛猛犸象是冰河時期最具代表性的動物，也是博物館或是在教科書中不能或缺的展示教學材料，本案所購標本保存相當完整，

難能可貴。鏟齒象

外形非常奇特，牠的下門齒呈平

鏟狀，下顎骨亦寬扁並與下門齒相接合，形成一個約1公尺長的鏟子狀下巴。根據此

種特化構造，科學家推測鏟齒象可能生活於沼澤區，利用其鏟狀的門齒撈食水中的植物。之後陸續購入了德國侏羅紀的魚龍、古鱷、海百合以及中國貴州三疊紀的魚龍和海龍，其中來自德國的標本係產於德國著名的化石寶庫Holzmoden的油頁岩層，其年代上屬中生代的侏羅紀，距今約一億八千五百萬年，這3件化石不但本體保存完整，其獨特的清修整理手法，更是展現了極致的化石之美，其中魚龍的腹中還育有兩隻小魚龍，非常稀罕難得，為展示上不可多得的精品。而來自中國貴州的海龍屬於一個目前科學家還不是很了解的類群，該標本主體仍嵌埋於岩板上，頭部則完全自圍岩中清修出來，對於研究及展示亦具極高價值。

產於摩洛哥距今六千七百萬年前的滄龍頭部化石



德國侏羅紀地層發現的黃鐵礦化海百合
(張介宇攝)



產於摩洛哥距今六千七百萬年前的滄龍頭部化石

92~93年發表著作

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>> 人類學組





嘉義縣魚寮遺址
出土陶罐

本館人類學組包括：民族學、考古學、體質人類學等三個分支學門。這三個分支領域通過共通的文化概念與方法論，綜攝人文學、生物學與社會科學的基本性質，結合為博物館人類學 (Museum Anthropology)。

博物館人類學最重要的志業在於：以區域的整體性與系統化之收藏與研究為職責，掌握當代文化研究 (cultural studies) 的知識趨勢及其成就；呈現文化的多樣性及其互動關係，傳遞各種生態適應的獨特方式，保護被威脅之社會遺產、促進並塑造文化保存和進步的環境。臺灣博物館人類學，需要具備「將廣袤的世界文化、湮遠的過去，再現臺灣原住民面前」的能力。

博物館是一個社會文化表徵，具體而微的社會文化現象，亦是一個各部分密切相關的整體。除了蒐藏與研究，博物館人類學的論述範疇，更包含展示與教育的溝通場域。事實上，本館生命科學廳與人類學 (南島民族 中國人的心靈生活) 廳的相關「常設展示」主題，便引導當前人類學組的人員進用與蒐藏政策。

目前人類學組主要的蒐藏品分為三個大類：第一類為南島民族 (臺灣、新幾內亞)、中國西南少數民族的民族誌標本。第二類為臺灣及閩、粵漢人之建築構件、宗教器物、手稿、圖畫、錄音帶、宗教儀式錄影帶等。第三類為中國大陸、東南亞與臺灣出土之考古學標本。

在前述基礎上，以東南亞、大陸與島嶼東南亞為對象之近期發展計畫，區分為下列幾項：

- 一、臺灣搶救考古學、「民族考古」與「舊社考古」之研究。
- 二、中國古人類學之研究。
- 三、臺灣中部考古學原住民區域民族誌與科際整合研究。
- 四、臺灣漢人工藝蒐藏與研究。
- 五、中國西南少數民族之民族誌標本蒐藏。
- 六、臺灣南島民族、東南亞之民族誌資料庫系統之建立。
- 七、博物館之人類學研究 (Anthropology of Museum)。



苗族西江地區的繡片

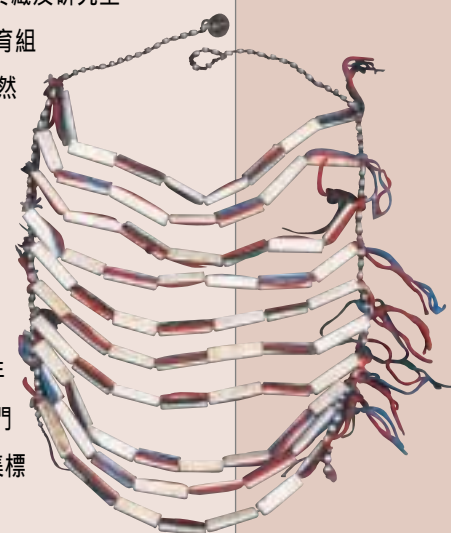


巴布亞新幾內亞
的面具收藏

雖然自然物與人為之物的妥善管理與運用，是博物館人類學工作首要的科學任務。然而，博物館人類學更具有能自我反省的人文特質。在生態、社會與人性的倫理基礎上，我們探索博物館「如何」存在與經營的普通法則；更要思考「為誰」，與「為什麼」存在與經營之理由。這個人類學實用主義的性質，使人類學專業得以親近博物館學，並服膺知識的政治實踐之職志。

現階段的臺灣本土蒐藏與研究，是本館人類學組的基本關懷。我們雖有建構完整的博物館人類學之理想（例如，按世界各洲地理與文化，劃分為幾個區域，成立專責於各區的部門；設立完整的物質文化研究之實驗設備），唯受限於既有之編制與經費，便需廣泛的尋求各種公、私部門社會資源的支援；更需要主動的與國內、外相關大學、藝術院校、博物館及其他研究機構，持續的進行有計畫的交流與合作。

人類學組二大學門在數位典藏及研究工作之外，也積極地支援科學教育組特展前的現場解說人員訓練、自然學友之家的現場演示、簡訊撰稿以及巡迴展演講系列。館內常設展示廳中，本學組的研究人員不但提供了珍貴的展品及其背景資料，也參與了更新計畫以及簡介的撰稿工作。近年來，年度大、小型特展，學組內兩學門研究人員主動參入了策展、蒐集標本及數位加值動畫展示。



阿美族的胸飾

考古學門



何傳坤

研究員兼人類學組主任

中國古人類學研究的時空架構，涵蓋了自距今1200萬年至1萬年前曾活躍於中國不同古生物地理區內的古猿、直立人、早期智人及現代人的演化史。整合了古生物學、古植物學、體質人類學及舊石器考古學的實物證據，古人類學家進而推論及復原古代人類的生活方式。臺灣考古學歷經百年的研究史，目前從

事考古學研究的學者們除了致力於搶救考古遺址的艱鉅工作外，也試圖探討臺灣地區舊石器時代晚期、新石器時代早、中、晚期來自外地的移民，在本島內拓墾的歷史及過程。



屈慧麗

助理研究員

持續進行考古田野與文物研究工作，過去曾參與臺東卑南遺址發掘與資料整理工作。近年負責臺中南屯山仔腳、彰化福田里及新竹縣犁頭山遺址等考古挖掘。民國91年5月起投入臺中惠來里遺址的挖掘及考古教育推廣工作。民國92年調查沙鹿南勢坑遺址及瞭解地方文史工作者的貢獻。近年來側重文化資產的保存、文物詮釋、社區考古學等。



劉克竑

研究助理



清水遺址發掘工作

長期從事臺灣田野考古調查與發掘，過去曾參與卑南與十三行遺址搶救、發掘與資料整理工作，近來曾擔任臺中縣清水鎮清水遺址、嘉義縣新港鄉板頭村遺址、雲林縣梅林遺址、臺中縣大肚鄉營埔遺址、臺中沙鹿鎮鹿寮遺址等多項考古計畫的協同主持人。寫過二本關於考古學的兒童讀物，向學童與社會大眾介紹考古學與臺灣史前史。



大馬璘遺址出土之磨製石鏟

臺東縣卑南考古遺址發掘

民族學門

王嵩山

研究員

民國77年5月入館服務，負責民族誌標本蒐藏管理、博物館展示規劃與設計、南島語族社會文化體系研究。歷任助理研究員(77.5~86.10)，副研究員(86.10~93.1)，研究員(93.1~)；展示組主任(93.2~94.4)，人類學組民族學門負責人(86.8~)，《博物館學季刊》總編輯(91.2~)。人類學知識來自於國立臺灣大學人類學系所(學士與碩士，66~74)、英國牛津大學社會文化人類學研究所(博士候選人，82~86)。

學術專長領域為南島語族社會文化體系、文化形式、博物館人類學、集體知識與社會、政治人類學、歷史人類學等。

曾兼任國立臺灣大學人類學系、國立臺北護理學院、東海大學歷史學系、國立暨南國際大學成人與繼續教育研究所講師、副教授。現分別兼任東海大學美術研究所、逢甲大學歷史與文物管理研究所、國立雲林科技大學文化資產維護研究所等系所教授。

其他工作人員

技士：洪夙慶

技工：林德牧、董瑪女

趙啟明

約僱技術員：曾美華



廖紫君

助理研究員

主要的業務是負責民族學標本的蒐藏與管理，過去的蒐藏著重於臺灣原住民與臺灣漢人宗教文物，自93年本學門增加近千件的苗族服飾、織品的蒐藏，以及為數不少的大洋洲器物。這些藏品已電腦化管理，將透過展示、出版、教育活動等與觀眾見面。

個人研究的興趣從文物的預防性保存與維護，逐漸移轉到藏品研究，研究的領域則專注到漢人宗教，尤其是民間信仰研究，其中王船儀式為個人參與關注的課題；另一方面隨著苗族服飾蒐藏量的增加，研究主題也將延伸到這些標本。

此外與中小學合作，協助學校教師進行本土化與多元文化教育，參與學校的戶外教學，建立博物館與學校的合作關係，也是個人長期投入的工作。



東港王船祭

重要蒐藏與研究成果

一、臺中市史前文化新發現——惠來里遺址

臺中市惠來里遺址位於東經 120 度 37 分 50 秒、北緯 24 度 09 分 58 秒，行政區屬西屯區，地理區屬臺中盆地西側，海拔約 70 公尺左右，西側遠眺可望見大肚臺地及南屯區。本館人類學組在 91 年起陸續在市政路與惠來路交叉口衣蝶百貨商場大樓旁、市政路與河南路交叉口 144 號抵費地進行考古發掘與調查，發現遺物的內容包括距今 3,500 年前的牛罵頭文化及一千三百多年的番仔園文化。惠來里遺址範圍內有新光三越及老虎城等著名消費中心以及未來的新市政中心預定地，發現遺物的面積至少 150,000 平方公尺。

惠來里遺址分布在筏子溪附近，河南路惠來厝段抽樣發掘顯示出牛罵頭時期聚落內人口眾多而且定居長久。93 年在新市政中心預定地，發現了代表營埔文化的玉環及陶片，玉環材料來自花蓮。144 號抵費地出土大量的石器製造工具 石材 石錘等，生產工具如石刀的出現顯示當時鐵器的使用並不普遍。遺址內灰坑、



惠來里考古挖掘出土的狗獾標本

獸骨、炭化梗稻以及至今十九具俯身葬人骨的出土，顯示 1,000 年前的大聚落是以農耕為主要的生業型態，並以漁獵採集為輔。這些發現對於瞭解臺中盆地，尤其是筏子溪一帶先住民的生活方式提供了第一手資料。

在惠來里考古挖掘出土的動物標本，經鑑定計有鳥、兔、鹿、羌、野豬、狗獾、食蟹獾等，其中狗獾是目前臺灣已絕跡的鼬科動物。



惠來里遺址試掘現場



惠來里遺址俯身葬人骨的出土



惠來里遺址挖掘期間配合推出的考古班教育活動



惠來里遺址挖掘期間配合推出的考古班教育活動

古臺中盆地是否是湖泊沼澤區？為解答這個疑題，未來將繼續進行深度考古調查，並採集古生態環境相關訊息，來釐清惠來里遺址群文化內涵及時空分布，然後再探討牛罵頭文化與北部及南部地區紅色繩紋陶文化之間，以及營埔、番仔園文化與鐵器時代的淵源關係。

惠來里遺址自第一次試掘以來，其中涉及中央及地方教育文化權責機構、特定的人員如市長及其候選人、文化局、其他單位的考古工作專業人員、民意代表、里長、市民大眾、國小、國中、高中、大學生、地方文化資產承辦人員、報社、雜誌社、電視臺平面及電子媒體記者，以及我們考古團隊的每位成員等，實可做為現今「考古在城市」之有趣案例。

挖掘期間，本館為了增加民眾對文化遺產的認識、瞭解、欣賞，進而引以為傲，陸續推出「失落的史前惠來人」與「古早臺中人特展」，及臺中尋根之旅、終身學習認識過去——考古班教育活動。目的是透過各項精心安排的課程，了解考古學的內容與臺灣的史前文化，更透過參觀考古遺址，把書本上的知識化為實際的經驗。期待將珍惜文化資產的觀念向下紮根，大眾認識維護考古遺址的重要性，以達到傳遞文化資產新傳理念。

二、阿里山考古新發現

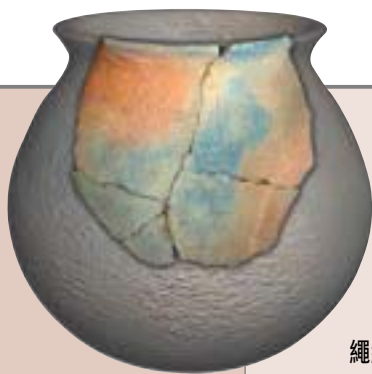
第一位在阿里山地區進行考古調查者是日據初期的森丑之助，他在曾文溪上游的 6 個地點分別發現了打製石器、磨製石器和陶器，其中 5 處為當時鄒族的聚落所在。一九三〇年代臺北帝大土俗人種學教室（臺灣大學人類學系的前身）的大規模高砂族調查中，發現地表隨處可見打製斧鋤型器，這批材料中包含了 9 個屬於阿里山鄉的遺址。

1941 年鹿野忠雄於鄒族舊社 *Vuyio* 和 *Yingiana* 進行發掘，他在 *Vuyio* 發掘到數具石板棺，兩處出土的陶

器都附有網形印紋的紅色陶片和黑色陶片、無紋而含有石英粗粒的厚陶片；石器除了薄型打製石斧外，還有磨製扁平偏鋒石鏃、細型石鏢、磨製石鏃等。他認為這些遺物即是鄒人祖先所使用的。

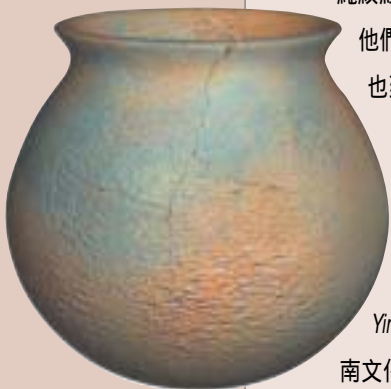
光復後沉寂許久的阿里山地區考古工作於 1993 年再度展開，中央研究院歷史語言研究所的研究人員在曾文溪上游進行了系統的考古調查工作，又發現了 15 處遺址，並重新在 *Yingiana* 遺址進行發掘。自 1997 年以來，本館人類學組的研究人員多次於阿里山地區進行調查與試掘工作，確認的遺址有四十多處，經過試掘的只有樂野村 *Veijo*（鹿野忠雄 1941 年發掘的 *Vuyio*）邊緣一處稱為 *Daimaeyayan*（若以鄒語拼音則是 *Tamayayana*）。自 2002 年至 2003 年，為了確認阿里山地區史前文化的層序，考古學家們先後在達得安 3 號、新美村 *Niahosa* 等三處遺址進行大規模的發掘。由這些工作首次確認阿里山地區的史前文化內涵，主要可分為以細繩紋紅陶為代表的 *Yingiana* 下層文化遺存（距今約 3,800 年），以及以素面粗砂紅褐陶為代表的 *Yingiana* 上

阿里山 *Yingiana* 遺址遠景阿里山新美村 *Niahosa* 遺址出土石板棺



層文化遺存 (距今900~200年)

*Yingjiana*遺址的下層(第二文化層)文化內涵可以代表阿里山地區最早的人類文化,這裡的文化內涵以新石器時代中期的細繩紋紅陶為主,根據碳十四定年,其年代距今約3,800年左右。這說明了大約從距今4,000年開始,他們所占據的生態區,除了丘陵、淺山之外,也到達了高山內陸河階,對於臺灣史前人的島內擴散研究具重大的文化史意義。



素面粗砂紅褐陶的主人與周圍族群一直有著密切的互動關係。在新石器時代晚期的 *Veiyu* 遺址中,除了出土和 *Yingjiana* 上層相同的文化遺存外,還有東部卑南文化系統的玉玦和玉管珠,新美村 *Niahosa* 遺

址也出土有非中央山脈西部地區出產的蛇紋岩質石鏃,由這些證據看來,新石器時代晚期阿里山地區的素面紅褐陶主人就與東海岸地區的文化有了頻繁的互動關係。

三、苗家吊腳樓

吊腳樓是苗人傳統民居建築,其特色是就地取材、占地少、寬敞、美觀、冬暖夏涼;盛行於貴州、湖南、川東等的苗族山區。

本館的這一棟吊腳樓來自貴州錦屏縣平略鎮彰化寨,臨清水江邊,屬歇山式穿斗挑梁木架干欄樓房,屋齡大約十多年,分為三層,總坪數約八十五坪。最底一層用於牛欄、豬圈、雞舍、堆肥、放柴等。中間一層為人居住,是三進式的格局,正中間是堂屋,設祖先牌位,家庭祭祖、宴飲、接客多在此舉行。堂屋

*Yingjiana*上層文化的紅褐色粗砂陶質容器及復原, *Taipicana1*遺址上文化層出土。



苗家吊腳樓中的廚房



苗家吊腳樓

兩邊的兩大間則按需要隔成睡房、客房、烤火間、存物間、通道等。頂樓為閣樓，存放穀子以及用來曬衣。

該房子原本是修建在斜坡上，這種位在斜坡的房子，修建時先挖出一個上下兩級梯形的平臺，梯級堡坎用鵝卵石砌成堅固的保護。有了這約一百平米的兩級平臺，整幢房子的支撐立柱便安放在上面。從側面看，最外面的一根柱子懸空而掛，同上面一級屋基持平形成了「吊腳」，俗稱「吊腳樓」因而得名。

屋頂使用杉木片，可保護主樓的外壁不受日曬雨淋。吊腳的部分有金瓜雕飾，增加美觀。吊腳樓在堂屋前面留出一個別緻的空間，簷柱中裝上空花曲欄長靠凳，俗稱「美人靠」；苗人最愛在此歇息小坐憑欄遠眺，客人來到也多在此接待暢談。

四、人類學組新增苗族蒐藏

人類學組民族學門於93年為了補強中國西南少數民族館藏，特別購進苗族一千多件的織品、服飾，還包括一棟吊腳樓。苗族藏品涵蓋了湖南、廣西、貴州、雲南、四川、海南等地區，但是以貴州東南的蒐藏最為豐富，該區域為苗人主要的聚居地。貴州東南地處雲貴高原東部，為長江流域與珠江流域的分水嶺，水域簡單的區分為北邊的清水江流域與南邊的都柳江流域。本學門早期的蒐藏以清水江流域居多，約有四百多件的蒐藏，以施秉、臺江、丹寨、雷山等為主，尤其施洞地區的繡片非常豐富。93年新入藏的標本，除了增加都柳江流域的服飾與織品，也補足了黔南、黔西北、黔東北、雲南等地的服飾。

這批新入藏的苗族服飾，是以1985年民族文化宮的分類方式，將苗族服飾區分為八十幾個式，每個式至少有一至二件標本，而式的命名以行政的鄉、鎮等名稱。該分類法是以苗語為劃分的基礎，不同地區的

苗將自身的認同鮮明的表現在婦女的服飾上；然而不同的是之間在其他文化相貌上的關連性，或式的界定與形成等相關的議題，都亟待解決。相較於早期入藏的四百多件苗族標本，是以村寨為描述的主體，雖然免除了分類的窘境，但是仍有待日後更詳盡的資料來補充。

民族學門蒐藏的吊腳樓，堪稱臺灣博物館苗族蒐藏的第一與唯一。該棟吊腳樓來自貴州錦屏縣平略鎮彰化寨屠寨村，屬於清水江流域，因水庫的營建而必需遷村，水庫工程已經在施工中，所以願意將該房子由本學門收購。

不論是織品、服飾蒐藏或者是吊腳樓、器物等，都彰顯出本學門在蒐藏業務上，作泛文化研究的意圖。苗的物質文化呈現出傳統和現代生活模式中的重要部分，當中所蘊含的符號系統，不但體現苗人的思考與文化邏輯，這批美麗豐富的文物不只是藝術，同時也記錄苗人歷史長流中遷移的歷史。



苗族施洞地區的揹兒帶

92~93年發表著作

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>> 典藏管理組

本館於86年組織條例修正通過後，比照美國博物館的登錄室(Registrar's Office)設置典藏管理組，為國內博物館界首創將「蒐藏」與「管理」分治而成立的專職單位。

就全館業務運作系統觀之，典藏管理組係蒐藏研究學組的行政中心，也是蒐藏作業的中樞，不但參與蒐藏政策和作業程序之研修，更負責協調蒐藏環境之規劃。全組現有成員5人：主任與組員為行政職，另有研究助理2名，統籌辦理登錄檔案管理與蒐藏作業等例行業務，以及由標本利用而衍生的借入、貸出、運輸、保險等相關作業。

本館的蒐藏自零開始，至今增加已超過七十餘萬件，其相關的業務日益增多；再者，各類展示之推出與館際交流極為頻繁，典藏管理組以有限的人力、高度合作的團隊精神，自87至93年完成了「瀝青坑的寶藏特展」、「敦煌特展」、「埃及特展」、「與龍共舞龍年特展」、「蒐藏回顧展」、「兵馬俑特展」和「慾望天堂——寶石特展」等展示之標本和文物的典藏管理相關工作，訂定了「蒐藏研究學組影像資料使用辦法」，並辦理「邁向博物館蒐藏管理新紀元研習會」(88年)及「新世紀博物館典藏管理研習會」(92年)。此外，研修「國立自然科學博物館蒐藏庫管理規則」，以及研擬「文物典藏機構防震防災及災害處理方案」和「國立自然科學博物館展品分級與安全評估報告書」，在典藏管理的領域中，逐漸建立專業化的形象和制度，就溝通協調方面，亦顯現預期的功能和成效。

預防性保存科學亦是本組亟待發展的方向之一，誠如前述隨著蒐藏標本的數量增多，伴隨而來的標本文物保存問題，亦隨之多樣化，加以由全球各地借展之標本文物，更是不一而足。如何建構一個適合標本文物的保存、展示環境，皆有待各專業學組與我們協力達成。



魚龍標本驗收



「藍天紅土的子民」
特展文物點交



佐藤正孝教授凝視
「甲蟲緣：佐藤心
——昆蟲捐贈展」

重要工作與研究成果

(一)典藏管理新紀元

92、93年可以說是本館典藏管理工作與研究的新紀元，不僅業務量有顯著增加，展現的成果更是多元而豐富。首先是以「知識管理」導向確立典藏管理職能在新時代的專業的認知。所謂「藏品就是知識」，典藏管理工作所面對的標本是本館的核心產能，典藏管理的業務與工作同仁的角色扮演就必須有更積極的意義，因此在本館蒐藏研究學術部門的一環中，它和13個學門的互動關係就不再是單純的行政服務支援，雖然本組只有5個成員，但這兩年我們努力跨出傳統窠臼，開創了豐收的嶄新里程：

在累計將近 80 萬件的標本蒐藏量中，往年大多保持在平均每年 3 萬多件的成長，但是從 93 年起我們規劃了 6 萬件的年成長目標，透過五組協調會議及每月的統計資訊檢討，在 93 年底標本擴充量登錄了 6 萬 8 千件，蒐藏量的成長超過了往年的兩倍。

(二)館際合作與交流

「館際合作與交流」是一項新增的業務，我們在 92 年向教育部申請一筆小額的經費，舉辦一場「新世紀博物館典藏管理研習會——藏品展示與展品管理」學術研討會，廣邀國內公私立博物館典藏管理從業人員參加，建立人才資訊並成為推展館際合作交流的起點。

此外本組同仁基於館際合作交流推動角色，積極作為聯絡窗口，在 93 年陸續成功的推出「岩壁上的精靈——艷紅鹿子百合（本館館花）」以及「重新發現臺灣獼猴」兩項特展，送到中國大陸巡迴展示，也受到高度的好評與喜愛。

(三)護蟲使者三人組

在動物學組昆蟲學門詹美鈴老師的促成下，日本佐藤正孝教授捐贈本館 10 萬隻甲蟲標本，這一大批稀有的珍客要遠渡重洋，是一件相當不簡單的工程，尤其是運送過程的前置作業，更是不容疏忽的專業挑戰，本組章晨玫小姐在標本包裝運輸作業的專業經驗條件，成為護蟲使者之一，和詹老師連袂赴日，花了一週的時間共同細心針插、固定標本，處理包裝，終能完好無缺的順利運回，對本館可謂難得可貴的貢獻。這批標本入館後，本組許美蓉小姐又接手策劃，與昆蟲學門共同在本館「蒐藏密室」即時推出「甲蟲緣：佐藤心：佐藤正孝教授捐贈昆蟲標本」特展，蔚成轟動，三位小姐可謂護蟲特使，功不可沒。

(四)學術研究與發展

典藏管理專業職能受到肯定，反映在與各蒐藏研究學門的互動上，首開其例的是章晨玫小姐擔任 93 年農曆年底推出的「雞既鳴矣：雞年特展」策展人，這項特展以活體展出為重點，更是一項高難度的挑戰，特展成功順利的推出，證明了本組同仁在館務與學術互動合作的職能，研究發展也跨出了傳統典藏部門的藩籬。

另一方面也反映在接受外界委託的學術研究計畫上：鄰近的太平市響應文建會地方文化館的發展策略，以其豐富的自然生態環境及景觀背景，規劃籌設「太平市自然生態館，其「館藏研究」與「經營管理」內容軟體，在 93 年委託本組周明主任主持研究規劃，計畫題目分別訂為：「館藏研究的社會意義與機制建構」及「自然生態館經營管理策略規劃」。這項研究規劃對未來太平市自然生態館在建館的方向、內容及營運策略等，成為重要導航和基礎建設藍圖。



「雞既鳴矣——雞年特展」展場一隅

人員簡介

周明：主任

許美蓉：研究助理

章晨玫：研究助理

其他工作人員

組員：陳美樺

技工：詹妙達



太平市自然生態館館藏研究與經營管理座談會



92~93年發表著作

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專書

- 周明 2003 臺灣木雕藝術（光碟與網站） 苗栗縣文化局木雕博物館。

新世紀博物館典藏管理研習會——文物包裝技術實作課程

Preface

/ Mean Chou

Great improvement in the core collection

As everyone can see, museums, be it foreign, domestic, public, or private, come in various sizes and with missions nowadays. Many organizations consider themselves “museums” by their own definitions so museums seem to be rich in variety. However, in the field of museology, it is commonly agreed that collection, research, exhibit, and education are the four major missions of a museum. Among these missions, “collection” and “research” are the foundation and prerequisite of exhibit and education.

If exhibit and education are the bones and flesh of a museum, collection and research are the heart and soul of a museum. Undoubtedly, collection and research constitute the “core” of a museum. Practically speaking, the significance of a museum lies in its collection instead of its architecture. Without collection and knowledge, the museum does not exist (Timothy Ambrose, 1993).

The “collection” of a museum can further bring out the significance of its collection and research for knowledge development. The collection itself symbolizes “knowledge.” A museum preserves the

collection in order to study and distribute its valuable knowledge. Therefore, exhibit and education are another two sensible and necessary functions of a museum. The contribution that a museum makes lies in the accumulation and development of the knowledge of its collection.

Lately, people have realized that the sustainable development of the living environment and the value of life are based on biodiversity. The life and death of all creatures on earth are correlated. Human beings, as part of the ecological system on earth, have to rely on the use of natural resources in all aspects of their life, including eating, dressing, living, moving, economics and culture. Currently, the “Green National Income” highly stresses green consumption, ecological balance, biodiversity, and landscape values. The web of life weaved by Mother Nature plays an even more crucial role in cultural, social, and natural aspects.

In the light of the significance of biodiversity and the urgency of knowledge development, the Museum has raised the objectives for its collection. Since 2004, it has become a policy of the Museum to increase more than 60,000 specimens every year. It is expected that the Museum's collection will exceed 1.2 million within 10 years. In 2003, for example, the Museum owned 34,847 specimens. An enormous increase was witnessed in 2004 when the total collections reached 68,651 pieces (please refer to the following tables). The rapid expansion of the collection symbolizes both the importance of biodiversity and the rapid improvement of the Museum's core capacity for knowledge dedicated to social contribution. If the Museum has enjoyed any minor achievement, it is jointly made by the staff of the collection and research departments. While the cultural education has to be implemented step by step, we are confident that the great improvement of our core abilities will certainly yield fruitful results in the future!



>> Milestones

for 2003-2004

2003



"Flightless Birds" Exhibition.

- 2003 The Anthropology Department assisted in preparing the establishment of the first Damaling Culture Site Museum in Puli.
- 2003.01.01 The Museum established the "Preparation Committee for the National Digital Archives Program." The Director was the chairperson while the two deputy directors were deputy chairpersons.
- 2003.01.13 After the National Feng Huang Ku Bird Park was severely struck by earthquakes and typhoons, it donated more than 1,200 pieces specimens of rare birds that it collected over 19 years to the Museum. Later the Museum held a special exhibition titled "Flightless Birds."
- 2003.03.04 The *Sargentgloryvine* Stem donated to the Botanical Garden by Mr. Chang, Fu-di from Jhinlun Township of Taitung County 10 years ago finally produced flowers.
- 2003.03.05 The Museum hosted "The International Seminar on the Management of the Botanical Diversity and Botanical Gardens in Southeast Asia."
- 2003.03.18 The Botanical Garden exhibited the Poison frogs from the rain forests of Middle & South America. Six *Epipedobates tricolor* were successfully bred in two years of breeding. It is the first breeding success among domestic educational institutions.
- 2003.03.18 The museum obtained a piece of Triassic Ichthyosaur which was found in Guizhou, China. This five-meter long specimen is great for exhibition and crucial in studies of marine reptile.
- 2003.03.27 The archaeological team members of the NMNS unearthed potsherds and animal bones representing the Ying Pu Culture and the Fan Zih Yuan Culture at Hui-Lai Li Archaeological Site in the seventh phase of city new developing plan. The unearthed artifacts provided abundant information about the life of the prehistoric people inhabiting the Taichung basin area.
- 2003.05.30 Professor Chen, Ju-chin from the Institute of Oceanography from National Taiwan University donated about 300 pieces of precious deep-sea manganese nodules as well as rock and mineral specimens to the Museum. Professor Chen also donated more than 1,100 volumes of important geologic journals, theses, and books.
- 2003.06.12 The museum showed the recovering processes of the fossil Ichthyosaur in exhibit hall. It was the first time that the fossil cleaning and repairing processes were demonstrated to the public in the museum.
- 2003.06.12 Le Cheng Temple, a third grade of national registered historic site in Taichung city, donated 15 pieces of paper cuts for the Museum to display.
- 2003.07 The Museum held "A Root-Seeking Trip to Hui-Lai Li Archaeological Site in Taichung City" for students to experience archaeological work and learn about the cultural changes of the Hui-Lai Li Archaeological Site.
- 2003.07 The associate curator of the Botany Department, Yang, T. Y. Aleck, and the Department's research assistant, Hu, Wei-Hsin, visited to the Missouri Botanical Garden in the States to learn the operations management skills of the Garden for one month and returned in early August. They brought back more than 30 different rain forest species (cuttings or seeds) and more than 50 varieties of daylily bulbs.
- 2003.07.09 Archaeological staff members from the Museum went to Oceania to make a film on the houses and the homeland of the Austronesians and broadcasted on Taiwan Public Television.
- 2003.07.10 The Department of Earth Sciences from National Cheng Kung University donated more than 800 pieces of rock and mineral specimens collected by Professor Chen, Chi-chieu during his lifetime to the Museum. Those specimens significantly increased the Museum's geological collections.
- 2003.07.10 Yang, Zong-yue, an associate researcher in the Botany Department went to the US to work on the "Taiwanese Style of Specimen Image and Literature Collection Research Project."
- 2003.07.11 The Museum held a special exhibition titled "Flightless Birds" to display part of the bird specimens that the Museum has preserved on behalf of the National Feng Huang Ku Bird Park. The Museum also requested Mr. Jhang, Ci-yu of the Taichung Ostrich Park to provide hatched ostriches to teach the general public about the birthing process of baby ostriches.
- 2003.07.12 Through 3D computer animation, the Museum reconstructed the Da Ma Lin Archaeological Site in Puli Township, Nantou County where 3000-year old cultural remains were unearthed.

- 2003.07.17 The Museum History Room was renamed "Behind the Scenes: Research and Collection" to display major collections, research results, and important specimens of the Museum.
- 2003.09.16 Professor Yang, Houng-yi of the Department of Earth Sciences from the National Cheng Kung University donated more than 1,000 pieces of rock and mineral specimens that he used for research and teaching for over 30 years to the Museum.
- 2003.09.18 The museum allocated 20 millions NT to purchase four pieces of Cretaceous dinosaur fossils. These specimens were very important in paleontological research.
- 2003.09.30 The Museum unearthed a complete 1300-year-old boy skeleton of Fan Zih Yuan Culture at the Hui-Lai Li Archeological Site in Taichung City. The skeleton is worth further to academic research.
- 2003.10.02 The Ministry of Education commissioned the Museum to hold the "Management of Museum Collections forward the New Century Seminar." Dr. Lin, Jyuan-jyuan, a restorer of the National Museum of the American Indian, which is affiliated to the Smithsonian Institution, was invited to attend the seminar.
- 2003.11 Mr. & Mrs. Bleddyn and Sue Wynn-Jones, the keeper of Crug Farm Plant (nursery garden in Wales, UK), and Richard Hayward, a fern expert, paid a visit to the Botanical Garden of the Museum and went to field of Southern Cross-Island Highway to collect specimens in company with the staffs of the Botanical Garden.
- 2003.11 The chief of the Botanical Garden of the National Science Museum, Tokyo, Professor Tatsuo Konishi and three other visitors, including Dr. Goro Kokubugata, Dr. Sadamu Matsumoto, and Mr. Atsushi Ebihara visited the Botanical Garden and went to Lanyu Island to collect specimens in company with the staffs of the Botanical Garden.
- 2003.11.04 The Museum held the "Paper Cuts and Pastes of Yue Cheng Temple — Decorating the Home of Hansi Mazu (Goddess of the Sea) Special Exhibition" to display the paper cuts and pastes donated by the Yue Cheng Temple and Wan Fu Temple of Kaohsiung. The paper craftsmen demonstrated the paper cutting and pasting techniques as well as koji pottery making techniques.
- 2003.11.07 Wang, Sung-shan, an associate Curator of the Anthropology Department was granted the "Research on the Education and Culture of Aborigines Writing Award" by the Ministry of Education in 2003 with his book titled "The Past is Now : The Social Construct of the Tzou Tribe's Culture in Modern Alishan."
- 2003.11.19 The Museum's archaeological workers excavated a complete an adult male burial, which dates back to the Fan Zih Yuan Culture (approximately 1,000 to 1,300 years ago) in central Taiwan at the Hui-Lai Li Archeological Site in the seventh phase in Taichung City's new developing plan.
- 2003.11.24 The Museum's archaeological workers were commissioned by the Chiayi County Government to work on the "Yu Liao Archaeological Site in Taibao, Chiayi County Archaeological Investigation and Excavation Project." It was confirmed by the archaeological team that the reserved construction area for the cinerarium tower was part of the Yu Liao Archaeological Site.
- 2003.11.27 "The Lost Prehistoric Hui-Lai Man" displayed a boy burial and other artifacts unearthed at the Hui-Lai Archeological Site in Taichung City in September of 2002.
- 2003.11.28 The Museum's archaeological workers found potsherds of Da Ben Keng Culture dating back 4,500 years at the Hui-Lai Li Archeological Site in Taichung. As a result, the Museum accumulated more prehistoric collections from the Hui-Lai Li Archeological Site in terms of quantity and local cultural sequence.
- 2003.12 The Museum established the "Frozen Animal Tissue Center for Collection."
- 2003.12.09 The Museum's archaeological workers found a third burial from the Fan Zih Yuan Culture at the Hui-Lai Li Archeological Site in Taichung. The female skeleton was estimated 20 to 30 years old when she died approximately 1,000 to 1,300 years ago.
- 2003.12.17 After 10 years of negotiations and much effort, the Museum eventually purchased a male mummy and a human shaped coffin from a private French collector. These two pieces of the collection were then displayed in the Museum.



The artifact of the Yu Liao archaeological site.

2004



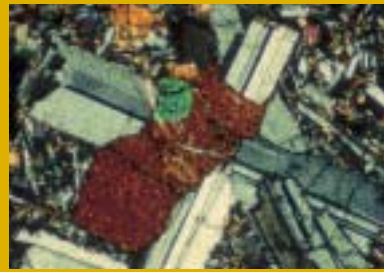
Pyrenaria buisanensis

- 2004.01 The Museum invited Mr. Jason Delaney, an expert in bulbs from the Missouri Botanical Garden in the States, to the Botanical Garden to share his experience in planting bulbs and give speeches.
- 2004.01.01 The Museum proceeded with the Service Upgrade Project of the Social Education Department of the Ministry of Education to plan the construction of "The Geology Hall". The project is expected to be completed in three years.
- 2004.01.29 The Museum held the "Tucson Show: Collectors Pilgrimage of Gems and Minerals" to display more than 90 pieces of museum-class specimens purchased in Tucson, Arizona, USA by researchers of the Geology Department.
- 2004.02.17 The Director of the Exhibits Department, Jhou, Wun-hao, was promoted to Academic Deputy Director. He specializes in life sciences, amphibiology, and herpetology.
- 2004.03.31 The Museum completed the virtual exhibit system "The Austronesians in Taiwan" to integrate the digital archives with virtual exhibit education.
- 2004.04.10 The Museum purchased from Miaojia of Gueijhou in China a four-story Hakka feet-hanging tower which covered 85 pings and weighed 12 tons. The Museum staff spent 22 days putting together the tower after which they held a restoration commencement ceremony. Following the ceremony were Miao singing and dancing performances.
- 2004.04.15 The Museum invited Professor Hu, Chung-hung, Professor Yang, Houn-g-yi, Professor Chen, Ju-chin, and Professor Dai, Chang-fong to be research associates in the Museum's Geology Department.
- 2004.05 Yang, T. Y. Aleck, the associate researcher of the Botany Department, visited to Okinawa to collect specimens in the field and visited Okinawa Expo Park in Nago to meet the Director General of the Park. Aleck also received two seedlings of the endemic palm of Okinawa, *Satakentia liukiensis* (Hatusima) H. E. Moore, from the Park.
- 2004.05.01 The Taiwanese endemic aquatic firefly species, *Luciola ficta* Olivier, was successfully rehabilitated in the Firefly Observation Area of the Mini Zoo. Rehabilitation and breeding techniques for *Luciola ficta* Olivier were established.
- 2004.05.03 The film titled "Joy of Life: Ostriches" produced by the Museum was short-listed in "The Film Festival of International Museum and Cultural Asset Films."
- 2004.05.21 The Vice-president of Costa Rica, Lineth Saborio, who came to Taiwan to attend the presidential inauguration, paid a visit to the Museum.
- 2004.05.26 The Culture Bureau of Taichung County Government commissioned the Museum to hold the international seminar titled "Forestry Culture and Space Development" which was part of the "Pioneering Project for Revitalizing the Forestry Cultural Zone in Dongshih Township." Researchers from the US, Canada, Japan, and Germany were invited to attend the seminar.
- 2004.06.01 The Museum's archaeological workers identified some bones and teeth of *Meles Linnaeus*, a mammal never recorded in Taiwan, from the animal bones unearthed in the Lu Liao, Yu Liao, and Hui Liao Li Archaeological Sites. This is a significant discovery in the mammalian history and archaeological history in Taiwan.
- 2004.06.04 Wuweishan camellia (*Pyrenaria buisanensis*), an almost extinct plant which had disappeared for hundred of years, was found in Mt. Jhenlishan mountain in Pingtung. The Museum's researchers applied cutting propagation, tissue culture and restoration techniques to the plant.
- 2004.06.24 The Department of Earth Sciences of the National Central University donated to the Museum more than 780 pieces of mineral and rock specimens and thin sections collected by Professor Yen, Tsang-po in Taiwan, Japan, and Korea. In addition, 88 geologic maps and 50 field notes were included in the donation.
- 2004.07 Yang, T. Y. Aleck, the associate researcher of the Botany Department visited Nong Nooch Tropical Garden in Pattaya of Thailand. Aleck also met the Park's Director General, Mr. Kampon Tansacha, and received 15 different species of palm seedlings and 8 different species of palm seeds from the

- Garden.
- 2004.07.17 The Museum held a special exhibition titled “The Story of Ancient People in Taichung” to display the animal bones and artifacts excavated by the Museum archaeologists in the Hui-Lai Li Archaeological Site. The Minister of Education, Du, Jheng-sheng, was invited to preside at the commencement ceremony.
- 2004.08 Two distinguished guests from the Center for Tropical Forest Science were accompanied by Professor Sun, Yi-fang of the Department of Life Science, Tunghai University to visit the Museum and the Botanical Garden.
- 2004.08.03 The Museum was a liaison for the traveling exhibit “The Fairy on the Cliff—Special exhibition of *Lilium speciosum* var. *gloriosoides* Baker” in China.
- 2004.08.12 The Museum held the “Examination of Macrofungi Seminar” to promote educational activities introducing macrofungi.
- 2004.08.31 Academic Deputy Director, Chou, Wen-hao examined the mitochondria DNA and voiceprints of *Polypedates megacephalus*. He later renamed it as *Polypedates braueri* (White-lipped Tree Frog).
- 2004.09.09 The Museum held the “Museum, Knowledge Construct and Modernity: Seminar during the Celebration of the Seventieth Birthday of Director Han, Pao-teh.”
- 2004.09 Museum staff paid a visit to the Zhejiang Museum of Natural History.
- 2004.10 Mr. Ted Herrington, a botanical scholar from the US, visited the Botanical Garden of the Museum. The Botanical Garden made an arrangement for the scholar to collect specimens in the field of Mt. Chilanshan (Ilan), and Mt. Hohuanshan (Nantou).
- 2004.10 Mr. Richard Hayward and Richard Martin, both fern experts, came to examine the fern plants at the Botanical Garden of the Museum and visited the upland ferns at Meifong Farm (Nantou) with Dr. Yen, Hsin-fu.
- 2004.10.22 The Museum held a workshop on the collection research and management techniques of the Nature Center of Taiping City Exhibit Hall.
- 2004.11.02 Director Li, Chia-wei was sponsored by the Bureau of Foreign Trade's “Cultural Reward Project” to visit Australia.
- 2004.11.18 Dr. Cheng, Yen-nien from the Geology Department, Dr. Wu, Xiao-chun from the Canadian Museums of Nature in Ottawa, and Dr. Ji, Qiang from the Chinese Academy of Geological Sciences, Beijing published a paper titled “Triassic marine reptiles gave birth to live young” in *Nature*.
- 2004.12 The Museum held the Fifth Avian Biology Seminar across the Strait.
- 2004.12 Yang, T. Y. Aleck, the associate researcher of the Botany Department visited the Royal Botanic Garden, Sydney and Royal Botanic Garden, Montanna Botanic Garden, Australia. Aleck also discussed with Ms. Sally McGeoch, the manager of Wollemi Pine International Company, the Museum's donation of living Wollemi Pine to the Company and asked the Company to assist in investigating the details of exporting Australian plants to Taiwan.
- 2004.12.14 A retired professor from Nagoya Women's University, internationally well-known Coleoptera expert, Sato Masatakai, donated to the Museum more than 100,000 pieces of insect specimens that he collected over the last 40 years. It was the largest single donation received by the Museum since its establishment.
- 2004.12.23 The performance of our Director, Li, Chia-wei, was rated by the Ministry of Education as “Excellent,” the best rating.
- 2004.12.23 The Museum and the National Taiwan Museum cooperated to duplicate and exchange the replicas of *Bubalus teilhardi* and *Rhinoceros sinensis hayasakai*.
- 2004.12.24 The Museum held a press conference for the “Donating and Planting Ceremony of Rueensland Bottle tree(T. Mitch. ex Lindl.) K. Schum.” and the “Establishment of the Australian Plant Area.” The two Rueensland Bottle tree(T. Mitch. ex Lindl.) K. Schum. are the most noticeable trees being introduced into the Australian Plant Area.



Professor Sato Masatakai



>> Department activities

for 2003-2004





>> Zoology Department

Over the last two years, the Zoology Department has experienced some changes, particularly in staffing. Yan, Chong-wei, will retire from as Birds and Mammals Division researcher. Dr. Shih, Si-de of the Invertebrate Division will transfer to the National Chung Hsing University. In the future, we expect to recruit a researcher specializing in avian biology or mammals and another one specializing in land invertebrate to join the animal research team.

The Museum has collected 410,000 animal specimens, but there is still room for substantial expansion. We will still focus on the collection of specimens in Taiwan in the future. When we have a complete range of animal specimens in Taiwan, we will turn to East Asia to extend our collection.

The animal specimens account for more than two thirds of the total specimens in the Museum. The quality and quantity of the Museum's animal specimens are one of the best in Taiwan and cover a wide range of different species. We will use a subsidy from the National Science Council to invite domestic and foreign experts from various related fields to conduct short-term research projects in the Museum in order to make good use of and preserve these specimens. We will also welcome zoology experts from domestic and foreign research institutes to work with or exchange specimens with the Museum.



The Zoology Department is currently responsible for managing the Mini Zoo as well as the Giant Crab Aquarium and Coral Reef Aquarium of the Exhibit Hall. The Department members are highly appreciated for their hard work in long-term breeding, exhibit, and caring for alive animals. Apart from collecting and researching, the staff has to provide long-term support to other divisions, bred more animals for exhibitions, and assisted in special exhibitions at irregular intervals. The joint effort of all staff members in the Department resulted in the best performance among all departments in the Museum in 2004. All the staff members in the Department are encouraged to keep up their good work in order to be a well-rounded museum worker.

Invertebrate Division



Chao, Shyh-Min

Curator / Head of the Zoology Department

My teacher used to say, "Doing administrative work is just like washing diapers for other people's kids." Nowadays people stop washing diapers. I am just "changing diapers for other people's kids!" Changing diapers is much easier than washing them. All the staff members of the Zoology Department are very professional. Almost every one of them has research projects to work on outside the Museum. They are mostly occupied and do not "nag" me for research projects. Thus, the most important work for me as a Head of Department is to "attend meetings on behalf of them."

In terms of research, my focus over the last two years has been on the systematic and ecological status of echinoderms. I mainly collect and examine animals inhabiting the continental shelves and deep seas over the coastal areas around Taiwan, with particular focus on echinoderms. I also work on the study and restoration of echinoderms, echinoderm diversity, and sea urchins in the coral reef areas of Kenting National Park. The projects that I have carried out in the last two years include: (1) Study of the Diversity of Deep Sea Echinoderms (National Science Council), (2) Study of the Diversity of Echinoderms in Northern and Northeastern Coastal Areas of Taiwan (Council of Agriculture), (3) Changes to the Invertebrate Inhabiting in Kenting National Park — Case Study of Echinoderms (Kenting National Park Headquarters), and (4) Use of the Museum's Specimens to Assist the Development and Research of Elementary and Junior High School Teaching Materials (Ministry of Education).

In terms of science education and exhibits, I assisted the Museum with the special exhibition titled "Volcanoes of the Deep Sea" in 2004 and borrowed rare specimens such as *Bathograea* sp., *Rimicarus exoculata* (*Alvinocaris lusca*), and *Pompeii*

worms from the National Museum of Natural History of France. Since 2004, I started to assist in the live exhibit of the Coral Aquarium and Continental Giant Crab Aquarium. Currently, I volunteer to take care of the Live Exhibit Area of the Mini Zoo in the Museum. The living animal long-term exhibit is very difficult and breeding and management are even harder. However, I learned a lot in the past two years and got to know many elementary and junior high school teachers who are keen on ecological teaching methods. These experiences have enriched my life and inspired me to conduct further research.

The collection, research, science education, and exhibit works in the Museum come in various facets and are very interesting. Just as the buzzword in the biological field goes, "It is highly diversified." I really enjoy my job!



"Volcanoes of the Deep Sea" Exhibition.

*Cymo melanodactylus**Valenciennesa strigata*

Demonstration of specimen making.

Lee, Kun-Hsuan

Assistant curator

I. Establishment of the exhibit areas for marine invertebrate and mangroves at the estuary in the Mini Zoo in 2003

Although the breeding of live animals has brought us great challenges and troubles, they are highly effective in promoting science education and exhibits. The outdoor space on the second floor of the Museum has become busy again after staying quiet for years. The Museum continues to breed and exhibit more than one hundred of marine invertebrate and fish species. The Zoology Department takes full responsibility for the production of the interpretive figures, materials, and even signboards. The accumulated figures and interpretive texts are more than enough to compile a thick illustrated catalogue of marine animals.

II. Special exhibition demonstrating the production of animal specimens in the first half of 2004

In order to allow the general public to understand the production process and application of animal specimens, all staff in the four divisions of the department were mobilized to attend "The Animal Specimens On-site Production Special Exhibition." Staff from every division took turns demonstrating the production of animal specimens and interacting with the audience by answering their questions. As there was a shortage of staff in my division, all the staff, including the collection manager and outsourced technician, had to take turns attending the two shifts every Tuesday (in fact, there are only three of us). The special experience of sitting behind the glass window to face the audience was new to me. I realized that it is not easy for people to work behind the glass window. Furthermore, I learned that the general public is in great need for a real-time interactive process to answer their questions.

III. Establishment of the living coral reefs exhibit aquarium in the end of 2004

Learning from the experience of building and operating the Mini Zoo, we successfully displayed a stable and beautiful living coral reef ecology in front of the audience with the help of ample funding and professional planning from the vendors. We also successfully filmed the interesting interaction and symbiosis of many coral reef animals. In the future, we will prepare for the living *Xenograpsus testudinus* exhibit regarding on an unusual crab inhabiting the seabed of the Turtle Island.

IV. Implementation of "Diversity of Deep Sea Echinoderms Study" Project of the National Science Council, and "Diversity of Invertebrates on the Continental Shelves over the Coastal Areas around Taiwan Study" of the Museum

During the implementation of the projects, I often took Ocean Researcher I and some fishing boats to collect samples from the ocean. After encountering strong winds and waves several times, I learned the difficulty of working on the sea by experiencing very bad seasickness. After two years of collecting, we registered 3,582 specimens, covering 1,048 species, 367 families, and 13 phyla. Currently, hundreds of unusual invertebrate specimens from the deep sea ranging between 500 and 3,000 meters remain to be identified by experts. Most of the specimens have never been recorded before in Taiwan or the rest of the world.



Shell-Maker Anemone and Hermit crab.

Collection by SCUBA diving.

Insect Division



Flower pollinated by sphingid moth.

Lin, Cheng-Shing

Curator

Thanks to the sponsorship of the National Science Council, I had the opportunity to conduct research on the diversity of Miridae of Taiwan and subtropical mainland China. The National Science Council also provided a subsidy for international travel so I was able to examine the Mirid type specimens in the Hungarian Natural History Museum, Vienna Natural History Museum, and Bishop Natural History Museum in Hawaii. In addition, I visited the Huasi of Gueiyang in Gueijhou, Kuankuo Water Preservation area in Sueiyang County, Natural Reserve of Wuyi Mountain in Fujian province, Dayao Mountain Forest Natural Reserve in the autonomous county of the Jhinsiouyiao Tribe in Guangsi province, Shiwanda Mountain Reserve in the autonomous county of the Shansihjhuang Tribe in Guangsi province, and the natural reserve of the Basian Mountain of Jishian in Tianjin. Apart from broadening my knowledge horizon, I collected many specimens. I was glad to publish three new species of Psallopinae found in Taiwan and mainland

China. I also publish 10 new species of Isometopinae and another three new species of Bryocorinae.

As I participated in the National Digital Archives Program, which allowed me to attend the Entomological Collection Network Meeting in Cincinnati and the 20th Entomological Society Meeting in the US. Moreover, I also participated in the planning of "The Red Imported Fire Ants" Special Exhibition and the consulting of other exhibition and education program.



"The Red Imported Fire Ants" Exhibition.



Gu, Shih-Hong

Associate Curator

In recent years, the lab of insect physiology in the Zoological Department uses several Lepidopteran insects, such as silkworms as experimental materials to study: 1) endocrine system of insect molting and metamorphosis, 2) cell growth regulatory mechanism. Our attention is currently focused on the autocrine activation of both cell growth and ecdysteroidogenesis by prothoracic glands. During these recent years, we have already published more than 20 papers in several top international journals of entomology and endocrinology. The results can be divided into two parts:

I. Studies on the controlling mechanism of insect metamorphosis. The classic central scheme of insect endocrinology, established as early as 1950, states that high ecdysteroid titers in the presence of high juvenile hormone (JH) titers lead to larval-larval molts. High ecdysteroid titers in the absence of JH lead to metamorphosis. Our results showed a new regulatory controlling mechanism on insect molting and metamorphosis. We found that changes in basal hemolymph ecdysteroid levels in silkworm larvae can modulate JH biosynthetic activity of corpora allata, with very low ecdysteroid levels during the early last larval instar leading to the absence of JH. Moreover, our showed that PTTH signal transduction pathways undergo specific developmental changes, with the absence in transduction in prothoracic gland cells occurring during the early last instar. This absence in PTTH signal transduction pathway during the early last larval instar plays a critical role in directing the development of larvae, because it may be the most upstream developmental event in the endocrine cascade that leads to very low ecdysteroid levels, inactivation of corpora allata,

as well as larval-pupal transformation.

II. Discovery of new function of prothoracic glands.

It is well known that the function of prothoracic glands in insects is to synthesize and secrete ecdysteroids. Our latest studies showed that the prothoracic glands synthesize and secrete the autocrine growth factor that could greatly increase their own cell growth and ecdysteroidogenesis. This work has provided some new insights into insect cell growth regulatory mechanisms. Our current research deals with the interaction of the autocrine factor and endocrine systems during insect development and how the environmental factors (such as nutrition) affect both systems.

III. The research results that we have published in recent years have caught the attention of international and domestic experts in related fields. Two university textbooks on insect physiology published in the US in 2002 cited our serial papers: 1. *Physiological Systems in Insects* (Klowden M. J., edited, Academic Press, 2002); 2. *Insect Physiology and Biochemistry* (Nation J. L., edited, CRC Press, 2002). Moreover, the *Encyclopedia of Entomology* (Capinera J. L., edited, Kluwer Academic Publishers) also cited our research results.

As to scientific exhibitions, several years ago, we organized the temporal exhibition "Insect Chemical Communication World". Incorporated with our research, we are currently showing the special exhibition of the life cycle of silkworms at the mini zoo. We also have the education program of "Silkworms and Cocoons" in the Theater Classroom. These exhibitions and education program facilitated the children's understanding of mysterious insect world and inspired them to explore nature.



silkworms



Berlese-Tullgren funnels



Huang, Kun-Wei

Assistant curator

I started to gather and collect soil mites since 2004, which was a brand new experience for me. The main purpose of this project was to understand the species of soil mites in Taiwan and changes in the population of soil mites in different seasons. Therefore, Taiwan was divided into four areas in my project. Sample forests of low, medium and high altitudes were chosen in each area respectively. Following the planning process, I worked with Mr. Yang, Wan-cong to establish two soil sample areas in Dakeng of Taichung City and another two in Lian-hua Lake of Nantou. We gathered dead tree branches and fallen leaves over an area of 50 square centimeters and soil samples that were 30 meters deep. After brining the samples back to the Museum, I used Berlese-Tullgren funnels to collect soil mites and asked student workers to make slide specimens with them. As soon as this procedure was confirmed to be applicable, we moved on to collect soil samples from different areas in Taiwan. Over the collection period of more than one year, I often worked until six or seven o'clock in the evening as I had to travel between different sample areas. I accumulated many new experiences during the collection process. In February of 2004, I endured the freezing temperature of 0 in Yakou along the South Cross-Island Highway. In March of the same year, I had to shovel snow more than 30 meters deep before being able to gather soil samples in Wuling. These are very unusual experiences for me, a field worker from a subtropical area like Taiwan. When I climbed Guanshan and Yushan to reach sample areas for two days in a row, I had to admit I was not a young man anymore. During the visit, I also got to know why the Taiwan Laughing Thrush is called the "Trash" bird. In May of 2004, at the Fushan Botanical Garden, I saw a mother pheasant leading her babies in the front while the father

pheasant was herding the babies in the rear. The pheasant family just passed by in front of me without even looking at me. Another King of Monkey was eating leaves from the tree and enjoying himself. Then he turned to look at me.

In the first half of 2004, I still received some subsidies for other projects so I hired some temporary workers to select soil mites and make slide specimens. However, those projects were not related to the study of soil mites. As I already started the soil mite study, I thought it would be a good idea to make this study an official project and obtain external funding for it. If my project application went through, I could work on the Museum's study with external funding. As a result, with the introduction of Yan-chun, I met up with Mr. Syu, the technician of the Biodiversity Project in Taiwan Forestry Bureau. He supported my soil mite project very much. It was because although Taiwan has conducted many biodiversity projects and resource investigations over the past decades, data on soil mites had been unavailable and many specimens were not properly preserved. As a result, I obtained funding support from the Taiwan Forestry Bureau.

After collecting for one year, I registered 3,000 specimens of soil mites, collected around 15,000 soil mite specimens, made around 4,000 slide specimens, and examined around 1,000 pieces of soil mites.



Dried leaf collection.



Soil collection.



A corner of the special exhibition "The Red Imported Fire Ants".



Nymphs and eggs of Stenopsocidae sp.

Chan, Mei-Ling

Assistant curator

In terms of specimen collection in the Entomology Division, we registered 41,915 specimens over the last two years, including 36 holotypes and paratypes donated by Professor Hsu, Yu-feng, Dr. Stefan Naumann, Dr. Kimio Masumoto and Dr. Young June Lee. These donations increased the scale of the Museum's type collection substantially. Furthermore, we tried to collaborate with Yangmingshan National Park for managing its specimens in the Museum. Currently, the Park has entrusted the Museum to bring back more than 5,000 specimens that have received special treatment. In addition, Mrs. Lin, Su-hua generously donated part of the insect specimens and relevant processing tools used for insects owned by a deceased private collector, Mr. Ong, Sheng-jian, to the Museum. Since 2004, we purchased 15,000 insect specimens from Mr. Chou, Wen-yi, including 500 species of long-horned beetles. We also purchased more than 2,000 specimens of around 600 species of Rhinoceros beetles from Dr. Karl Werner in Germany. The most surprising donation came from Professor Sato Masatake in Japan. He was invited through Dr. Li, Chi-feng to visit the Museum. Professor Sato highly recognized the collection management of the Museum, so he was willing to donate 100,000 specimens to the Museum. At present, more than 53,000 pieces have been shipped to the Museum. It is expected that the rest of the specimens will be brought from Japan to Taiwan in 2005. Entomologists from Taiwan, Japan, Germany, Hungary, the United States and Poland etc. came to examine or borrow the specimens of the Museum. Over the last two years, the Museum has registered 39 entries for specimen loans, totaling 1,522 specimens for research.

With regard to research, I continue to work on the taxonomy of Psocoptera. In 2004, I worked on Troctopsocidae from Taiwan. This was a new discovery in Taiwan. Being very special creatures, the male has membranous wings while the female

looks like beetle. As Psocoptera specimen is too tiny to be dissected, I acquired dissection and specimen preparation techniques from an Psocopteran expert, Dr. Edward Mockford in USA. Dr. Mockford has studied Psocoptera for more than 60 years. By then, at the senior age of 76, he was still capable of dissecting the genitalia of the Psocopteran specimens with steady hands. He is very admirable and I hope I can be as good as him when I reach his age. In 2004, I worked on the taxonomy of Dasydemellidae, Amphipsocidae, Myopsocidae and Hemipsocidae from Taiwan to facilitate the understanding of the Psocoptera fauna of Taiwan. Besides, the dermatologist, Mr. Lin, Yu-chih, of Chi Mei Medical Center found booklice in the toenail of a patient and asked me for identification. Later, we worked together to publish the case report in the Clinical and Experimental Dermatology of the UK. The report was even chosen to be the cover story.

In terms of science education and exhibits, I formulated the "Wings of Insects" teaching plan for the Science Education Department. In addition, I worked with other colleagues to prepare the special exhibition of "Behind the Scene: Collecting and Preserving Animal Specimens." In 2004, when the National Science Council arranged a science week activity, I worked with Professor Yang, En-cheng to develop an activity titled "Insects eyes." Moreover, in response to current issues, we held a special exhibition of "The Red Imported Fire Ants" with Dr. Lin, Chung-Chi. The exhibit also toured Taiwan and received very good feedback. In order to express our gratitude to Professor Sato for his donation of more than 100,000 specimens, I assisted Miss Hsu, Mei-jung in holding the special exhibition of "Fascinating Beetles & Dedicated Sato." However, due to the limited space in the exhibit hall, we did not display all the specimens donated by Professor Sato. I also purchased a batch of insect specimens for the Naturalist Center. Larger sizes of insects were chosen for the batch to make them more appealing to the general public.



Booklouse in a patient's toenail.

Herpetology Division

Trimeresurus stejnegeri



Chou, Wen-Hao

Curator / Academic Deputy Director

I had been working with peer experts from the University of Wales in the UK to study the genetic diversity of *Trimeresurus stejnegeri* in Taiwan. We had been presenting our results from time to time and had some new discoveries over the last two years. The summary of all the research results was presented in the International Symposium on Snake Venoms-in Memoriam C. Y. Lee, which also concluded the research.

Over the last few years, the Council of Agriculture has been supporting the conservation genetics study of particularly rare or endemic amphibians in Taiwan. I used to work on the morphological variation of *Rana sauteri* tadpoles and identified cryptic species or subspecies. During the period of my research, while Mr. Jhangliao and I attempted to examine the inferences that were based on morphological data with genetic diversity, we understood the morphological variation was formed. It was surprising that the colonization sequence of this species was beyond our expectation. As *Rana sauteri* has clear evolutionary lineages and its distinct conservation segments have been proposed, the practical implementation of the conservation strategies will be our next focus. We also took the opportunity to start the conservation of *Rhacophorus aureiventris* and established many artificial breeding facilities in the wild. We expected by so doing, to increase the population of this tree frog before we can analyze the genetic diversity to create better conservation strategies.

The National Science Council has supported the Digital Museum of Bio-Culture Diversity Project for two consecutive years. We completed the Ethnobiology Project of Alishan earlier on. After that, we completed the "Study on the Natural Resources and Folkbiology in Pan-Puli Area" project and uploaded the results online. In the project for the National Science Council called "The Genetic Differentiation of *Rana psaltes* and *Rana adenopleura* as well as their genetic relationships with other *Nidirana* species," it was found that the genetic differentiation was obvious although

they shared similar appearances and have closest genetic relationships. The six *Nidirana* species can be categorized into two groups: those that build nests and those who do not. However, the similarity of the reproduction behavior is not totally related to their genetic relationship.

Looking from the perspective of biodiversity, it is the focus of the research to correctly name the species. It seems that the study on *Polypedates megacephalus* has enjoyed more progress. According to the sound recordings and DNA analyses of the species in Singapore, Hong Kong, Fujian province, Guangdong province, Guansxi province, Yunnan province and Taiwan, the so-called *Polypedates megacephalus* (type locality Hong Kong) should be a synonymy of *P. leucomystax* that lives in Singapore, Hong Kong, Guangdong province, Guansxi province, and Yunnan province. The Taiwan species *P. megacephalus*, which was so named in 1980's, belongs to the same genetic group as the species in Fujian and shows obvious genetic differentiation when compared with *P. leucomystax*. In this connection, the scientific name of *P. braueri* whose type locality is Taiwan should remain valid. Studies on *Bufo bankorensis* and *Rana swinhoana* are under way.

Over the last two years, I was called upon by Director Li to help with the Science Education Department and Exhibits Department as well as assume the position of Deputy Director. Therefore, I was occupied by administrative work most of time. In addition, I spent a lot of time on the planning and basic design of the Natural Education Zone in Feng Huang Ku in order to extend the science education purpose of the Museum. However, as the reconstruction and ownership problems of the National Feng Huang Ku Bird Park remains unsolved, the realization of the Natural Education Zone has to be suspended. Moreover, the Museum had worked with the National Taiwan University Experimental Forest on a collaboration project about the study, education and exhibition of a canopy from Sitou. After the complete action plan had been mapped out, the project had to be terminated due to landslides. It was sad for us to see that the previous efforts were for naught. That could be the only regret over the last two years. However, with the previous experience, it will still be possible to make our dream come true for this project.



Rana swinhoana



Taiwan Leopard Snake eating a turtle egg.

Huang, Wen-San

Assistant curator

The Herpetology Division mainly collects amphibian and reptile specimens in Taiwan as well as fish specimens. With the joint efforts of the Division members, the Division has collected 183 amphibious specimens, 716 reptile specimens and 3,000 fish specimens between 2004 and 2005. By now, the Herpetology Division has accumulated 10,993 amphibian specimens, 6,782 reptile specimens, and 3,010 fish specimens. The Museum tops the list when it comes to the collection of amphibious and reptile specimens and is catching up with other institutes with regard to fish specimen collection. In terms of special Exhibitions, the Division assisted in hosting the “Special Exhibition of Predators”, “Special Exhibition of Museum History”, and “Special Exhibition of Chinese Specimens” (Foreign Messenger of Specimen) between 2003 and 2004.

In the research aspect, as I spent the last three years in Cornell University in the USA, I have focused my research on the herpetology on Orchid

Island(Lanyu) Island, including the biodiversity, behavior, ecology, ecological functions and ecological structures of reptiles. Studies of these issues have touched upon the establishment and forecast of ecological modeling. Cornell University is situated in Ithaca in the state of New York, which is located in northeast America where it usually snows for more than 6 months in winter. On my way to school everyday, I sometimes had to push ahead when the snow had reached my knees. I had a hard time during my stay but it was a valuable experience. I can still recall that I had been pondering long over the behavior model of lizards and could not come up with the right answer. Out of a sudden, I spotted a book about economics. Right at that moment, I had a brilliant inspiration for my model. After step-by-step verification, I found my model could solve my problem. I had been filled with wild ecstatic happiness for several days until I finished the discussion with my professor.



Huang and his family enjoyed lobsters in Maine.



Asiatic water shrew specimens.

Birds and Mammals Division

Chen, Yen-Jean

Assistant curator

Thanks to the recruitment expansion project of the government, three temporary workers joined the Birds and Mammals Division as taxidermists in 2003 and 2004. As a result, the specimen making process was accelerated from the second half of 2003. By the end of 2004, 2,000 small mammal specimens and 800 bird specimens were completed. Currently, the Division owns 8,900 mammal specimens and 7,500 bird specimens, most of which being the endemic wild birds and mammals of Taiwan. Over the last two years, two Asiatic water shrew *Chimarogale himalayica* specimens donated by Professor Lin, Liang-gong of the Department of Life Science, Tunghai University in 2003 was particularly noteworthy and important. In addition, three skeletons of badger were donated from Japan on behalf of Dr. Oshida Tatsuo from Hokkaido University, symbolizing the recognition of the Japanese experts in the Museum's work and our service. The badger were collected by the Japanese marten expert, Hosoda Tetsuharu, and prepared by Dr. Endo Hideki of the Division of Mammals and Birds, Department of Zoology, National Science Museum, Tokyo. After comparing these three pieces of badger skulls, the Museum has initially confirmed that some animal bones dating back 500 to 2,000 years ago unearthed in central Taiwan are *Meles meles*. Other noticeable collections include 1,200 specimens from the National Feng Huang Ku Bird Park and 420 specimens collected and produced by Mr. Chen, Jia-sheng.

In terms of academic events, the Division organized "The Fifth Avian International Seminar across the Strait" in 2003 and collected 37 papers from both sides of the strait. Twenty-four representatives from China came to attend the seminar while around 200 Taiwanese experts registered for participation. A publication of conference papers was compiled. The conference was a great success. Chen also attended an

international conference on biology in Tokyo in 2004 and was the co-author of the paper "Recognition of the taxonomic status of *Balaenoptera omuri*" which was the follow-up paper of the study of a new species of Sei whale study—*Balaenoptera omura*. The Museum has collected four *Balaenoptera omura* specimens that serve as important references for the Japanese experts who want to study this new species.

Regarding the exhibitions and furthering education, the Division organized the "Friends on the East Coast of Taiwan: Photography Exhibition of Dolphins" to display the beautiful silhouettes of the whales and dolphins in eastern Taiwan. This special exhibition was a joint effort with the Kurshio Foundation in Hualien. In addition, the voices of these whales and dolphins were recorded with hydrophone and broadcasted publicly for the first time. In 2004, the special exhibition of the Year of Monkey "Rediscovering Formosan Rock-Monkeys" was organized to introduce the latest discoveries that show that the Formosan rock-monkeys were the ancient sole survivor species. The Museum also revisited the current Chichin harbor and National Sun Yat-sen University which were the original habitats of the Formosan rock-monkeys in 1862 when the Deputy Consul of Great Britain, Mr. Swinhoe coined the term "Formosan rock-monkeys." Various kinds of skulls and specimens of Primates were displayed.

The exhibit visitors were invited to take part in playing the monkey game in the Museum. A special exhibition area introducing Primates and the Museum was established.

Formosan rock-monkey



Major Collection and Research Results

The Management of the New Important Yearly Collection

The Museum started collecting fish specimens in 1991 when Mr. Tsan, Chien-ping donated a batch of fish specimens mainly gathered from the Dajia River.

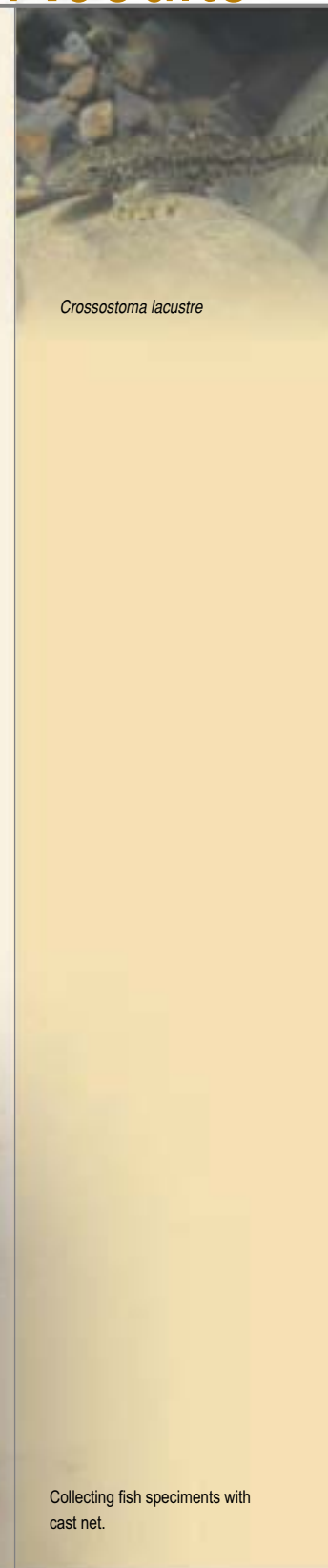
During September and October of 2002, we had an opportunity to join a collection tour to Guanxi, China. During the visit, a batch of the freshwater fish specimens was obtained, including rarely seen cave fish, *Oreonectes anophthalmus*, and *Sinocyclocheilus yishanensis*. As a result, the Museum started to think about establishing a proper collection of fish specimens. This idea received the support from Chief Li, Academic Deputy Director Chou (who is also the chief of the Herpetology Division of the Zoology Department), and Dr. Chao, chair of the Zoology Department. Afterwards, with the mobilization of staff and resources at that time, the registry number was confirmed to follow the same collection rules in the Herpetology Division of the Zoology Department. Eventually, the official collection and management procedure of fish specimens were established.

At the beginning of 2004, after a year of trials and errors, the Museum only accumulated over 200 fish specimens for a total of 680 pieces. Most of the fish specimens were freshwater fish from creeks and rivers of Taiwan. By then the Museum started to sort out the harbor fish specimens preserved in the storeroom (which were mostly brought back by Mr. Lee, Kun-Hsuan and Mr. Hong, He-tian of the Invertebrate Division from the scrap fish piles at the harbor). In addition, the Museum conducted a collection investigation at Dapeng Bay in Pingtung (with the Research Center of Biodiversity, Academia Sinica) and another one in Chigu Lagoon in Tainan. After that, in response to the invitation of Dr. Shao, Kwang-Tsao from the Research Center of Biodiversity of Academia Sinica, we listed the collection information of our fish specimens on the website of the Fish Database of Taiwan (<http://fishdb.sinica.edu.tw>) and synchronize our collection information with the relevant ichthyology databases after obtaining

approval from the appropriate authorities. The links available to six other advanced fish specimen databases: the Academia Sinica, National Museum of Marine Science and Technology, National Taiwan Museum, National Museum of Marine Biology and Aquarium, and Fisheries Research Institute, as well as to the international fish information database, FishBase (<http://fishbase.org>). The content is updated once in every quarter.

Due to the limited staff and resources, the Museum will mainly collect endemic freshwater fish with regional features in the initial stage of fish specimen collection. The acquisition of freshwater fish specimens was supported by many people who either provided relevant information or donations. Apart from scattered field collection, the Museum also works or exchanges specimens with other academic institutes to assist them in handling or examining the fish specimens they collected for research projects. For example, we worked with Guo, Jhong-siou from Feng Chia University, and Huang, Rong-fu from National Kaohsiung Marine University. These approaches significantly increased the number of our specimen collection. The scrap fish piles from Dasi fishing port and Donggang market were very important collecting sites for fish specimens.

Apart from increasing the species and quantities of our collection, we also hope to make good use of these species for academic research. The purpose of making the collection information public is to allow the general public to know the current status of the specimen collection in the Museum and encourage experts to use these specimens as much as possible.



Crossostoma lacustre

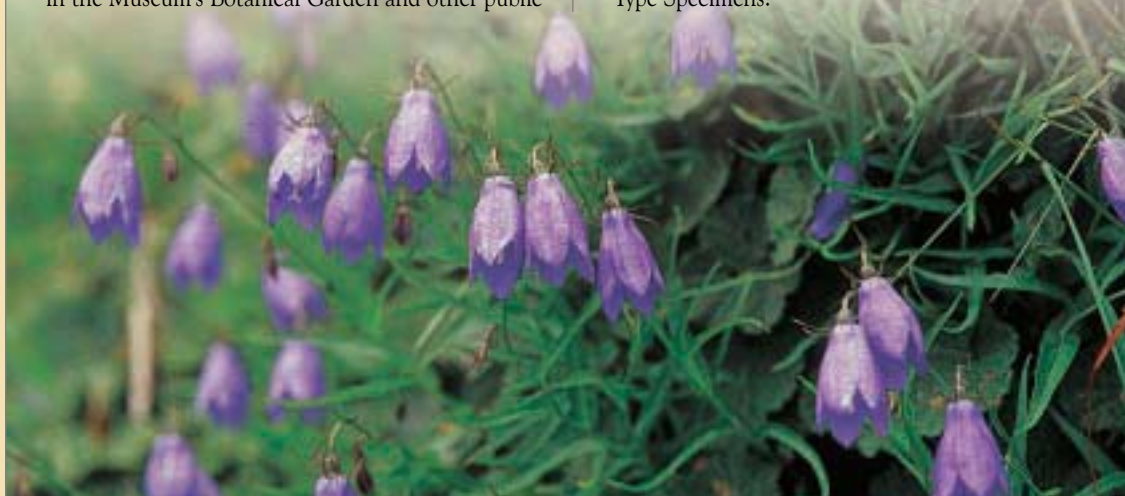
Collecting fish specimens with cast net.



>> Botany Department

The achievements of the Botany Department in 2003 and 2004 can be illustrated from four aspects, including collection, research, exhibit and science education support, as well as the implementation of the digital museum project. In terms of specimen collection, the Department registered 8,743 specimens in 2003. In 2004, with the joint effort of the Department members, 19,410 specimens were registered in response to the collection expansion project of the Museum. Regarding the field collection of specimens, the staff visited Yunnan province, Sichuan province, and the Northeast area of China to collect botanical and fungal specimens apart from those growing in Taiwan. A large number of specimens were obtained through exchanges with research institutes on the mainland, including many of the vascular plants and bryophytes. In addition, the slide specimens and set specimens preserved by the Department for many years started to be registered into the Museum's specimen management system. In terms of the preservation of genetic resources, the Department has worked on the collection of the fungal cultures for a long time and accumulated almost two thousand living strains. The Department also started the preservation of the genetic resources of important local plants in 2004. The preservation of living plants is conducted both in the Museum's Botanical Garden and other public

and private forest farms/ranches to increase the planting area. After the second half of 2003 when the Botanical Garden was accommodated to the Department, the parts of Botanical Garden and Collection Management Department have been helping each other to create synergy. On the research side, the researchers of the Department published 10 papers in 2003 and nine in 2004. The most noticeable contribution of the Department to the Museum over the last two years was that we provided various special exhibitions organized by the Botanical Garden corresponding to different seasons. Furthermore, the support provided by the Department to science education activities can be seen in the special exhibition "The Previous and Contemporary Lives of Flowers," release of popular publications and internet teaching materials. The internet teaching material "The Family of Fungi" produced by the Department in 2003 was granted a Merit Award in the 10th Golden Learning Award. In 2003, the Division officially participated in the National Digital Museum Program which lasts for five years. The Department is supporting this project collecting digital knowledge by conducting three sub-plans, including "Vascular Plants," "Nonvascular Plants" and "Fungi." The focus of these plans includes "Unit of Collection Knowledge," "Collection in the Museum" and "Type Specimens."



Vascular Plant Division



The flower of *Trochodendron aralioides* Sieb. & Zucc.

Chiu, Shau-Ting

Associate Curator

I specialize in plant morphology which explores the organization and functions of special plants as well as their life history. Apart from collecting mistletoes in Taiwan, Huanan area and Hainan Island, I also engaged in the systematic and geographic distribution investigation of mistletoes. The co-project with Chang Gung University carried on analyzing the natural pharmaceutical resources and studying the biochemical essence extracted from mistletoes. The analyses could serve as a foundation for further biochemical research and pharmaceutical tests.

Furthermore, based on evolutionan of genetic history of mistletoes, I carefully selected mistletoes that were studied in joint research with medical experts to understand the genes of the amino acids and proteins in these special mistletoes. Currently, the genes have been extracted for further transgenic experiments.

I will continue to study climbing plants and compare the structures and functions of the shrubs that are closely related to

Lonicera vines. I will also investigate the distribution, evolution, ecology and adaptation of the plants at different altitudes. Furthermore, I will focus on the role that climbing plants play in mid-altitude forests.

In addition, I also co-supervised the research on the vegetation on Penghu Islands and Turtle Island done by graduate students in the Institute of Ecology, Providence University in order to further explore the adaptation strategies and histories of special plants. Recently, I have started research on the structures and functions of saprophytic *Sciaphila ramosa* Fukuyama & Suzuki.

I have been involved in the exploration and application of several issues related to "Flowers," including the research on the fragrance from Butterfly Orchids, the introduction on the origin of flowers, the release of the educational CD-ROMs and the design of learning website "The Previous and Contemporary Lives of Flowers" as well as assistance in the teaching plan of "The Legends of Flowers."



"The Previous and Contemporary Lives of Flowers" Exhibition.



Gentianaceae plants are the largest species among the endemic species in Taiwan and mainly grow in the high mountains regions.

Yang, T.Y. Aleck

Associate Curator



Camellia buisanensis

I have been involved in Lanyu vegetation investigation and collection. I also presented the results of "Lanyu Vegetation Investigation" in the "Management of the Botanical Diversity and Botanical Gardens in Southeast Asia International Seminar" held by the Museum in March 2003. I visited the Preparatory Office of the Mountain Botanical Garden in Shangrila of Yunnan province on the mainland to discuss with the manager of the Garden, Mr. Fang, Zeng-dong, and the joint investigation of the vegetation resources on Mt. Cijiao-moxishan. In addition, I attempted to solicit vascular plant specimens from the Tianjin Natural Museum and Dalian Natural Museum. In 2004, I started the preservation of *Pyrenaria buisanensis* (Sasaki) C. F. Hsieh, S. Z. Yang & M. H. Su, *Medinilla hayataina* Keng, and *Vanoverberghia sasakiana* Funak. & H. Ohashi. Currently, *Medinilla hayataina* Keng and *Vanoverberghia sasakiana* Funak. & H. Ohashi are both cultivated in the nursery of the Botanical Garden in the Museum. Wuweishan *Camellia* is cultivated through cottage propagation, plants in tissue culture, and seedling, also in the nursery of the Botanical Garden in the Museum.

Chen, Chih-Hsiung

Assistant Curator

I mainly study plants in the high altitude areas of Taiwan, including the family of systematics and phylogeny of these plants. I am currently studying the Gentianaceae and Scrophlariaceae which include the relevant species in the regional areas, in particular the temperate plants in Japan as well as the Southern and Southwest China.

I have obtained preliminary results of the palynological study of Gentianaceae in Taiwan and their chromosomes. I have been working on a paper to publish the results in an academic journal.

A taxonomic study of the Scrophlariaceae is also under way. Preliminary results have been achieved in the morphological study of *Veronica* spp. and more data will be collected for comparing and analyzing. The specimens of *Veronicastrum* are collected from both Taiwan and Japan. Currently, the extraction and sequencing of nucleic acid have been conducted. After the specimens from Mainland China are analyzed, it is expected that we will understand more about the genetic evolution and biogeographic of the *Veronicastrum*.



Gentianaceae plants.



Bracharia mutica

Wang, Chiu-Mei

Assistant Curator

I am responsible for the collection and management of botanical specimens. The collection and management of botanical specimens look simple but is in fact very tedious and time-consuming. It takes a lot of hard work to manage the collection well. The botanical specimens in our Division total more than 100,000 pieces. My job responsibilities include the facilitation of specimen handling process, systematic specimen management by using computers, the proper preservation and protection of specimens, the provision of specimens for science education and exhibitions, and the provision of specimen information and literature material to researchers for their studies.

In addition, it is both my job and hobby to gather and photograph botanical specimens. By doing so, I can better understand the botanical resources and ecology in Taiwan. I have found some naturalized plants, such as *Solanum mauritianum* Scop.. I am currently studying the pollen, leaf morphology and genetic relationships of Rhamnaceae in Taiwan in order to understand more about the species and compile its basic data.



Solanum mauritianum

Huang, Chun-Lin

Curatorial assistant

My major responsibility is to manage the molecular systematic laboratory apart from engaging in the systematic and examination of Poaceae. I am currently working on the genetic variation analysis of *Oryza rufipogon*. I obtained more than thirty representative specimens of *Oryza rufipogon* from the International Rice Research Institute (IRRI). Abundant genetic data has been obtained from the rice (*O. sativa*) to complete genetic sequencing. The DNA molecular markers in the genetic data will be used to further explore the genetic relationships of the species and its pattern of positive selection.



Axonopus compressus

Nonvascular Plant Division

Lin, Chung-Kang

Assistant Curator

I have long been involved in the cultivation of the living regional hydrophyte specimens, including the collection and seedlings of rare local species, the plantation and promotion of the common species, as well as the exchanges and plantation of foreign waterweed species. I also planted local hydrophyte species in the pond in the rear part of the tropical rain forest greenhouse in the Botanical Garden of the Museum in order to establish a local ecology in the pond. In the artificial wading pool behind the Botanical Research Building, the hydrophytes collected by the Museum will also be planted to create a new landscape.

Moreover, I cultivate rare local hydrophytes and provide them to any units for teaching, such as *Isoetes taiwanensis* Devol, *Hygrophila pogonocalyx* Hayata, *Cephalanthus naucleoides* DC., and *Alisma canaliculata* A. Braun & Bouche ex. Samuel.

I was invited by the National Taiwan Science Education Center to compile my experiences in studying hydrophytes and published a book titled "Hydrophytes." This book, as part of the science study monthly publication series, was expected to facilitate the teaching and learning of the local environment in island-wide elementary schools. The book was published in November 2004.

The botanical specimen collection now mainly targets seaweeds, lichen, and bryophytes.



Usnea longissima

Fungi Division

Wu, Sheng-Hua

Curator / Head of the Botany Department

Over the last two years, I have been working on taxonomy of lignicolous Basidiomycota, with particular focus on corticioid and polypore fungi. Apart from morphological taxonomic study, several other molecular systematic research projects are also under way. Among them, *Phanerochaete* s.l. study, *Antrodia* s.l. research, *Trametes* s.l. study and *Polyporus* s.l. study are almost complete. The studies of *Antrodia* and its related species suggest that the endemic *Antrodia camphorata* in Taiwan do not belong to the genus of *Antrodia*. In the end of 2004, *camphorata* was proposed as a member of a newly presented genus, *Taiwanofungus*. The scientific name of *Antrodia camphorata* was also modified as *Taiwanofungus camphoratus*. The collection of fungal specimens will continue to focus on the macrofungi, especially lignicolous Basidiomycota, in Taiwan and mainland China. The fungal collection of the Museum was started from scratch. Over the last 15 years, I have assisted the Museum, together with other mycological staff in creating the collection. It now has registered about 19,000 specimens, making the Museum the largest collector of fungal specimens in Taiwan. The culture collection in the Museum also reaches almost 2,000 in number, representing an important culture collection center in Taiwan.

Since 2004, I was assigned the job as the general secretary of the Mycological Society of the Republic of China. I have organized several symposiums, and revised the Chinese and English information of members in preparation for the publication of contact list and the website of the society. Since 2002, I have been part of the editing committee of *Mycoscience*, an international mycological journal, and reviewed several papers submitted for publication.



Taiwanofungus camphoratus-holotype

Wang, Yei-Zeng

Curator



Ciboria shirana

I published two academic papers in 2003 and five in total for 2003 and 2004. One of the papers was published in an international academic journal to introduce a new species of Taiwanese *Lachnum* to the world and a new record. Another paper, which I presented with a graduate student, presented five new records of Taiwanese coprophilous pyrenomycetes. I published three papers in 2004. The first paper introduced a new species of *Mirostoma* to the world in an international academic journal while the second paper introduced two new records of *Lanzia* in Taiwan. The third paper introduced six new records of Tricholomataceae in Taiwan. The specimens described in the papers were collected in Taiwan and preserved in the storeroom of the Museum.

In 2004, I cooperated with the Information Department to produce the educational CD-ROMs, "The Family of Fungus" to introduce the fungi that are closely related to our lives. Total web accessibility was incorporated in the design to assist students, general public and the mentally/physically disabled in understanding fungi. This teaching material for fungi was granted a Merit Award in the 10th Golden Learning Award.

The Botanical Garden

Yen, Hsin-Fu

Associate curator

In the research aspect, I continue to study the ethnobotany of the Taiwanese aborigines and the folk herbal medicines in Taiwan. My research results can be found in the papers to be published. In 2004, I joined the research projects of The Examination and Monitoring of the Invasive Agricultural and Garden Plants (National Science Council 92-3114-B-002-012) and A Potential World Heritage Site - Evaluation and Research on Yushan (Co-chair of the Project of the Council for Cultural Affairs).

In terms of the display education of the Botanical Garden, a Special Exhibit for Bamboo Potted Plants (from April 1 to September 30) in the Botanical Garden. A garden for succulents was established in front of the Research and Education Center while a garden for Taiwanese ferns was established along Situn Scenic Road.

Several Special Exhibits of Succulents and Cactuses were held in the Botanical Garden in 2004 (from July 2 to October 3). I also assisted the Agricultural Research

Institute of the Council of Agriculture, Executive Yuan in organizing the 11th International Seminar on Plant Virus and Diseases. In addition, I established various channels through which the Botanical Garden and other institutions work together to collect the genetic resources of living plants. The collaborative institutions and plant species collected are as follows:

- I. The Experimental Forest, College of Bioresources and Agriculture, National Taiwan University: Collection of bamboo plants, fern plants, and medical plants.
- II. The Highlands Experiment Farm, College of Bioresources and Agriculture, National Taiwan University: Fern plants.
- II. The Agricultural Research Institute of the Council of Agriculture, Executive Yuan: Collection of Araceae plants, fern plants, and medical plants.
- IV. Taichung District Agricultural Research and Extension Station, Council of Agriculture, Executive Yuan: Collection of medical plants.
- V. Sunlinksea Travel Agency: Collection of medical plants.



Aloe vera (L.) Webb. var. *chinensis* Haw.



Alocasia odora (Lodd.) Spach.



Collybia sp.



Chang, Chen

Assistant curator

I specializes in the study of the conservation of *Lilium speciosum* Thunb. var. *gloriosoides* Baker and the preservation of the Taiwan native orchids. *Lilium speciosum* Thunb. var. *gloriosoides* Baker used to grow on the bare rocks in northern Taiwan but it tends to grow in the remote mountain areas nowadays due to the excessive human collection. Therefore, it is considered to be extinct soon. The current conservation task focuses on the following four aspects: 1. Permanently preserved the genetic resources: Develop propagation by tissue culture, seed propagation, and scale propagation to preserve the genetic resources on a long-term basis; 2. Develop artificial propagation: Plant *Lilium speciosum* Thunb. var. *gloriosoides* Baker with artificial culture for display and research purposes; 3. Habitat protection: Connect the communities, schools, and residents around the habitat to jointly preserve the habitat; 4. Organize educational promotions and displays: Promote the conservation of *Lilium speciosum* Thunb. var. *gloriosoides* Baker through educational promotions, plant displays, speeches, and publications.

The sunny and low land Taiwan native orchids to be preserved. The genetic resources of these orchids will be preserved while the orchids will be displayed in the Botanical Garden on a long-term basis. The long-term objective of the Botanical Garden will be to enrich the landscape of the Botanical Garden, the science education, the research, and the collection in the Museum with orchids.



Phaius tankervilleae

Chou, Wen-Neng

Assistant curator

My main responsibility is to take pictures for the Botanical Garden. I also compiles the catalogue, the data, and the name cards of the plants. In addition, I also works on the relevant studies and displays of mushrooms.

I specializes in the research and collection of the wild mushrooms in Taiwan, mainly agaric and gasteromycetes. Taiwan has a large variety of mushrooms but does not have many studies on them. Once the basic data of the wild mushrooms in Taiwan are compiled and the plantation technology in the private sector is properly introduced, new species of edible and medical mushrooms will be available to the public. It is important to educate the public that mushrooms have a vital role to play in the ecosystem. Moreover, plants and mushrooms are closely correlated as they can monitor the health of plants to send out signals for early prevention. Mushrooms can be displayed in the Botanical Garden for educational purpose, as in "Feast of Mushrooms : Special Exhibit of Mushroom Plantation" and "Story of Mushrooms : Photograph Exhibit of Mushrooms in the Museum."

Hu, Wei-Hsin

Curatorial assistant

I am mainly responsible for the maintenance of the Botanical Garden and the collection of living plants. In 2003 and 2004, my most of work was focused on the collection of the tropical plants genetic resources of south or southeast Taiwanese original which is both for display and *ex situ* conservation in the Garden. Our garden also collaborated with the neighboring elementary school to study the propagation and restoration of the rare Taiwanese Protophyte for campus teaching materials. The research collection can be incorporated into the country plant teaching gardens while the schools can preserve the rare Taiwanese protophyte. Currently, the following species have been propagated and reached a certain level in number: *Excoecaria kawakamii* Hayata, *Pittosporum moluccanum* Miq., *Cryptocarya elliptifolia* Merr., *Acer buerferianum* Miq. var. *formosanum* (Hayata) Sasaki, *Begonia fenicis* Merr., and *Allophylus timorensis* (DC.) Blume. The other Taiwan local species that are planted to create a green campus include: *Machilus thunbergii* Sieb. & Zucc., *Machilus zuihoensis* Hayata, *Scolopia oldhamii* Hance, *Syzygium paucivenium* (Robins.) Merr., *Sterculia ceramica* R. Br., *Severinia buxifolia* (Poir.) Tenore, *Randia spinosa* (Thunb.) Poir., and *Pourthiaea lucida* Decaisne. There are about 50 species of protophyte like this. This restoration project has not only focused on the primary and middle schools in Taichung City now but also hope gradually extend to other cities in the future.

Tropical plants are the major object to be collected and displayed in our garden. Most of time, it is difficult to storage the seeds of tropical plants as they lose vitality within a short time. To preserve the genetic resources in a stable way on a long-term basis and avoid the genetic resources from losing due to various reasons, we are making use of all its

resources to preserve the living materials in liquid nitrogen. With the low temperature to freeze the organ and plant tissue culture technology, species can be preserved on a long-term basis in a safe and stable environment which does not require a lot of caretakers and space. We are studying the preservation and growth of tropical orchid seeds of *Bletilla formosana* (Hayata) Schltr. in cryopreservation now.

In the herbarium of the Botanical Garden, I am a collection manager that is responsible for collecting and exchange specimens with other herbarium. In addition, I also charge of the nursery in the Garden to maintain our collections and exchange living materials, mainly the seeds and seedlings, with domestic and foreign botanical gardens or research institutions.



Seedling of micropropagation of *Dehaasia incrassata*.

Major Collection and Research Results

I. National Taiwan University and National Chung Hsing University donated fungal specimens to the Museum.

A few years ago, Professor Chen, Zuei-ching and Associate Professor Liu, Jin-huei from the Department of Botany, National Taiwan University, retired. At the end of 2003, they donated the fungal specimens that they collected for years to the Museum. Professor Chen is a well-known expert in macrofungi in Taiwan. He had been teaching in the National Taiwan University for almost three decades and his students are mostly working in the academic institutes in Taiwan. Associate Professor Liu specializes in the taxonomy of slime molds in Taiwan and published many reports on slime molds to establish the foundation of the taxonomy of Taiwanese slime molds.

Before his retirement, Professor Chen once mentioned that he would donate the specimens he collected for years to the Museum. In the spring of 2003, Chairman of the Institute of Ecology and Evolutionary Biology, National Taiwan University, Professor Hsieh, Chang-fu recognized the proper specimen preservation environment and system of the Museum as a national level specimen collection center. As Professor Chen had some health problems and seldom went to his laboratory after retiring for two years, Professor Hsieh was willing to donate the fungal specimens of the Institute of Ecology and Evolutionary Biology to the Museum. While Professor Chen had been staying in the US for six months, the Museum intended to confirm the donation with him to show our respect. Unfortunately, Professor Chen was struck by a heart attack and died at home in August 2003. Professor Chen was the founder and the first President of the Mycological Society of Republic of China. He actively promoted scientific collaboration between the mycological societies on the two sides of the strait. He was also once the President of the International Mycological Association Committee for Asia. His demise has been a great loss to the mycological field in Taiwan.

By the end of 2003, after negotiations with the Institute of Ecology and Evolutionary Biology, the staff from the Registrar's Office assisted in transporting the fungal specimens left by Professor Chen and his students to the Museum. After preliminary sortation for one year, it was found that the entire batch of specimens totaled more than five thousand in number. However, due to damage caused by insects or lack of sufficient collection data, only a small number of specimens will be actually preserved by the Museum. Afterwards, retired Associate Professor Liu, Jin-huei, also donated slime mold specimens to the Museum. More than 2,400 specimens were recorded after initial sortation, while around 1,500 specimens could be preserved in the Museum. These specimens comprise the most notable slime mold specimens in Taiwan.

Professor Tschen, Johannes Scheng-ming from the Department of Life Sciences, National Chung Hsing University retired the year before last. Professor Tschen had been teaching at National Chung Hsing University for more than ten years. He had taught many students and published many articles. Recently, Professor Tschen directed his graduate students to examine the macrofungi of Hui-Sun Forest Station and published several books on their results. Last year, Professor Tschen agreed to donate their specimens of macrofungi, around 300 in number, to the Museum after being contacted by the Museum.

The Museum offers a proper environment for managing and preserving these specimens donated by external parties so that experts in related fields can use these specimens for further research. In the future, we will still continue to contact universities or experts from other organizations to see if they are willing to donate specimens to the Museum. With the donated specimens, the Museum will be able to bring its functions and values into full play.



"The Previous and Contemporary Lives of Flowers" Exhibition.

II. Cooperation in expedition, calls for specimens and purchases of botanical specimens

- (1) The Department commissioned the Cultural Foundation of the Museum to sign the "Expedition in Mt. Cijiaomoxishan, Mts. Meilixueshan" collaboration agreement with "The Preparatory Office of Garden in Shangrila" in Shangrila, Yunnan in September 2003. It was expected that 6,000 pieces of vascular botanical specimens would be admitted to the Museum in August 2004. Afterwards, the Preparatory Office submitted an application to the Cultural Foundation in order to postpone the expedition until the end of 2005 due to changes in weather conditions. Currently, 3,700 specimens have been admitted to the Herbarium of the Museum through this project.
- (2) In January 2004, the Department signed an agreement with the Tianjin Natural Museum to call for vascular botanical specimens in Tianjin and Hebei areas. It was expected that 500 pieces of vascular botanical specimens (including more than 300 species) would be admitted to the Museum. Those specimens would be fastened on the sheets by the Tianjin Natural Museum.
- (3) In January 2004, the Department signed an agreement with the Dalian Natural Museum to call for vascular botanical specimens from the Mt. Changbaishang area. It was expected that 500 vascular botanical specimens (including more than 300 species) would be admitted to the Museum. Those specimens would be fastened on the sheets by the Tianjin Natural Museum.
- (4) The Department later will sign an agreement with Dr. Yang, Yong from the Institute of Botany, Chinese Academy of Sciences in Beijing to conduct a joint expedition in the midwest area of Inner Mongolia (including Erdos and Alashan); and with Mr. Peng, Chi-xing from Mt. Emeishan of Sichuan to conduct a joint examination of (or call for) the vascular botanical specimens in Emeishan area.

III. Special exhibition, traveling exhibitions, website, and educational CD-ROMs of "The Previous and Contemporary Lives of Flowers"

The Vascular Plant Division organized the special exhibition, "The Previous and Contemporary Lives of Flower," in 2002. The exhibit displayed the discovery of the earliest fossils of flowers, exploration on the origin of flowers, the phylogenetic and evolutionary relationships of flowers, creative activities of flowers based on the colors, forms, and fragrance of flowers, as well as the optimum of flowers. Much feedback was received from the visitors. In 2003, the book titled "The Previous and Contemporary Lives of Flowers" was published and topped the bestseller charts among the governmental publications. Upon the invitation of the Fo Guang Yuan Art Gallery in Kaohsiung, the special exhibition of "The Previous and Contemporary Lives of Flowers" was on display in the flowering season of early spring and attracted streams of people. After that, the Digital Kaohsiung County Museum of Natural History in the Kao Yuan Institute of Technology, Tainan County Museum of Natural History, Tainan Fossil Museum, Taiwan Flower Expo organized by Changhua County Government— Flower Festival also requested to show the exhibit. In 2003 and 2004, "The Previous and Contemporary Lives of Flowers" therefore went on a traveling tour from the south to the north in an attempt to assist various organizations in promoting science education. The residents in southern and central Taiwan were able to visit the exhibitions nearby and learn by playing. The special exhibition was expected to be held in central and northern Taiwan in 2004 and 2005.

As an abundance of data had been collected for the exhibition "The Previous and Contemporary Lives of Flowers," the Museum was supported by the Ministry of Education to design educational CD-ROMs and web pages for the topic. By the end of 2004, the website of "The Previous and Contemporary Lives of Flowers—Episode I" (<http://www.nmns.edu.tw/flower/>) was completed

nd included the following five parts:

- (1)Basic knowledge section: The organization and related knowledge of flowers were introduced through photos, texts and illustration.
- (2)Evolution section: The evolution of flowers was introduced through the origination of flowers, transformation of leaves to flowers, diversified inflorescences, and pollination of flowers.
- (3)Exhibit section: The scenes of the Jurassic and the Cretaceous were reproduced through 3D technology to allow the audience to understand the environments and landscapes in which the ancient flower and fruits grew. The diversity and wonders of the modern flowers were also introduced.
- (4)Fun and games section: Relevant experiments, picture stories and games were made available for children.
- (5)Children learning section: Children could learn about plants through well-designed animations.

Furthermore, “Extended learning,” “Data search,” “Site map,” “Message board,” and “The Digital Archive of Flowers” which incorporates digital archives are available on the website. It was expected that these educational resources would assist teachers in classes while inspiring students to learn about and look into the world of flowers. With this website to offer abundant information about flowers, it was hoped that flower lovers would enjoy exploring the website and learning more about flowers.

IV. Research Results of the Botanical Garden

Since the opening of the Botanical Garden, most plants have already grown to full size. Due to increased land price of Taichung City, the Botanical Garden is limited in size. However, we have used creativity to overcome geographical limitation. Looking beyond the constraints of space, we are still able to work on diversifying and expanding the Garden's collections. Over the past two years, we have been reaching out for collaboration partners to cooperate in preserving and taking care of the

special living plants. Several institutions and companies, including the National Taiwan University (NTU) Experimental Forest, Highlands Experiment Farm of NTU, Seed Improvement and Propagation Station, Taichung District of Agricultural Research and Extension Station, and Sunlinksea Recreational Park have agreed to work with us in the following aspects:

Medical plants: The Museum has collected around 500 species of medical plants. The collections have been sent to the Heshhe Tract of the NTU Experimental Forest (Nantou), Hsinshieh Seed Improvement and Propagation Station (Taichung), Puli District of Taichung Agricultural Research and Extension Station (Nantou), and Sunlinksea Recreational Park (Nantou) for preservation to achieve risk allocation. Currently, the Seed Improvement and Propagation Station has collected abundant herbal plants while the Sunlinksea Recreational Park focuses on growing the medical plants from medium elevations. At the same time, the Taichung District of Agricultural Research and Extension Station collects important medical plants from the United States. All of these achievements are a result the partnership of both parties.

Fern plants: The Museum has collected more than two hundred types of endemic plants of Taiwan. The Museum also collaborates with the institutions from different elevations to organize a more comprehensive collection of the ferns in Taiwan. During the past two years, the Museum assisted the NTU Experimental Forest to set up Hsitou Botanical Garden of Ferns to preserve approximately 160 types of ferns. The Museum has also assisted Fenghuang Tea Plantations to establish an educational fern garden. Meanwhile, the Museum collected around 160 species of ferns of medium elevations in Meifeng Upland Farm of NTU. In the future, more advances will be seen in the fern gardens as the planting and propagation technologies in the Seed Improvement and Propagation Station continue to improve.



“The Previous and Contemporary Lives of Flowers” Exhibition.



Tropical Rain Forest Greenhouse.

Bamboo plants: Hsitou Tract of the NTU Experimental Forest started collecting living bamboo plants and established a bamboo specimen garden long time ago. With the assistance from the Museum, the NTU Experimental Forest has collected 60 species of bamboo plants. Over the collection period, the Museum participated in hosting the Art and Cultural Festival of Bamboo, the Bamboo Ecosystem Exhibition, and the training of interpretive guides. In addition, the Museum assisted the Bamboo Culture Park in Chushan area in examining bamboo specimens, provided the information for interpretive signs, and offered trainings for interpretive guides. The Museum also helped in the interpretive events of Reichu Bamboos Specimen Garden and provided fresh bamboos as research material for the graduate students of the Department of Agronomy of National Chung Hsing University.

Araceae plants: Araceae plants are important rain forest plants and one of the major plants to be displayed among the Rain Forest Greenhouse collections of the Museum. The Hsinshih Seed Improvement and Propagation Station, which has put in a lot of time and effort on the cultivation of ornamental plants and owns more than 100 species, is the collaboration partner of the Museum. Last year, the Museum assisted the Station in collecting 20 species of endemic Araceae plants of Taiwan. In the future, the Museum will continue to work with the Station in collecting foreign species.

Seed plants database: There are almost 300,000 species of seed plants around the world. Some are as tall as 50 meters and weigh as heavy as several dozens of tons while some are just herbs of a few centimeters above the ground. Photosynthesis is not the only source of nutrition for seed plants. Some seed plants are saprophytes or parasitic plants while some prey on insects.

These various seed plants have been playing a vital role to play in the ecosystem and are an important factor in maintaining the environmental balance. However, the excessive human activities

and overdevelopment of the land have directly or indirectly affected the survival of the protophyte on the land.

With limited space, dense population, and extensive public roads, it is difficult to maintain a balanced ecosystem in Taiwan. There is an increasing interference in the survival of protophyte in Taiwan. Taiwan has more than 3,400 species of protogenic seed plants. Among them, 1,000 species are endemic species. Currently, the Taiwan Forestry Research Institute of the Council of Agriculture and Wufeng Plant Genetic Resources Center are collecting living endemic plants in Taiwan and have achieved very good results. The Taiwan Forestry Research Institute mainly collects the genetic resources of forest trees while Wufeng Plant Genetic Resources Center is doing well by working with the Endemic Species Research Institute to collect the endemic plants.

In order to preserve the plant genetic resources and sustain the scientific research, the Botanical Garden of the Museum established a database for the plant genetic resources in 2004 to preserve the fresh tissues, such as the living plants and seeds, of vascular plants. These resources can be used for both research and rehabilitation of the ecosystem and sustain the environmental preservation as they contain a large amount of genetic data.

The short-term objective of the genetic resources database is to collect the living plants and seeds of the protogenic plants in Taiwan. A chamber of constant temperature and humidity controlled by a microcomputer was established with the capacity of 18,000 liters to permanently maintain the plant activity in an environment of low temperature and humidity. In the future, it is expected that the genetic resources database can be expanded through collection, donation, and exchange to provide enough plants for preservation and research.



>> Geology Department

The Department is responsible for the collection, production, research, identification and preservation of geological specimens and data. In addition, the Department also supports the promotion and presentation of science education and exhibitions related to geology. To promote and implement the tasks in efficiency, the Department is divided into two divisions, the Rock and Mineral Division and the Paleobiology Division. The Department has 8 curators, 2 contracted technicians, and 5 project assistants respectively. The Department also invited Professor Hu, Chung-hung, Professor Yang, Houngh-yi, Professor Chen, Ju-chin, and Professor Dai, Chang-fong to be research associates. It is expected that these professors could offer their expertise to the Museum in the collection, research, and the establishment of the Geology Hall. As the handling, registration, storage, and management of specimens and archives require a lot of labor, the Department recruited 27 volunteers through the Science Education Department to assist in the implementation of relevant tasks.

The Geology Department mainly collects specimens related to the formation of the earth, environmental changes and the evolution of life, including minerals, rocks, sediments, vertebrate and invertebrate fossils, microfossils, plant fossils, and cores obtained from geological drilling cores. These specimens recorded the evolution of the earth and provided essential evidence for the appearance, evolution, and even distinction of the lives on the earth. We are committed to collecting and preserving these precious natural resources. At the outset, the focus of the collection is on the natural

resources in Taiwan and offshore islands. After that, the scope will extend to mainland China and the world based on the values (for research, exhibition, and education) and attributes of the collection. Most of the holdings are real specimens while the rest are casts, models, visual slides, digital images, thin sections of rock and fossil, and important literatures (related to the collection). For the purposes of exhibit, education, and research, the bones of important modern vertebrates have also been collected. Some specimens were collected by

Department members in the field while

some important geological specimens were purchased. It

should be noted here that we have been contacting experts and amateur collectors outside the

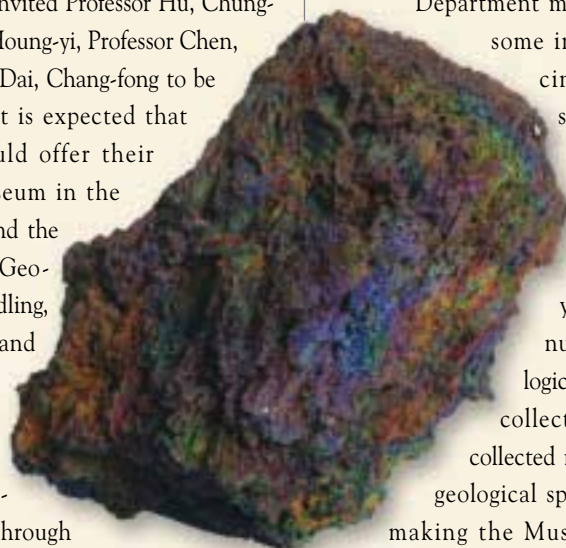
Museum over the last two years and received a large number of donation of geological specimens to expand our

collection. Until now, we have collected more than 39,500 pieces of

geological specimens of various types, making the Museum a major geological

specimen collection center in Taiwan.

Apart from collecting geological specimens for exhibitions and science education, the Department has been extensively collecting geological specimens mainly for research. As a result, the Department members also plan relevant studies to be done while mapping out the direction and objective of the collection. Over the last two years, the Department has focused on the following issues in terms of research: (I) The study on the marine reptiles of the Mesozoic Era; (II) Trace element geochemistry of peridotite xenoliths from southern China, Taiwan, and Penghu areas; (III) Comparative study of geochemistry, geochronology, and tectonics of



Collection of rock and mineral specimens : goethite from Chinkuashih, Taipei County.

gneisses from Yuantoushan of Nanao and Kinmen; (IV) Dolomitization in late Neogene carbonates of Sparty Islands; (V) Systematics and evolution of Elephantidae in the Quaternary in Eastern Asia; (VI) The study of the initial development of Pleistocene coral reefs in southwestern Taiwan; (VII) The foraminiferal assemblages of the Pleistocene cold seep carbonates in southwestern Taiwan; (VIII) Sr-Nd isotopic and zircon U-Pb SHRIMP study of the Precambrian metasedimentary rocks from the Alashan microcontinent, NW China. The funding of the research projects came from the annual budget of the Museum, the National Science Council's project budget, and the Petroleum Fund. The projects were conducted by the Department members with the facilities of the Department. In addition, the Department received several cooperation from the National Taiwan University, the National Cheng Kung University, Central Geological Survey, Chinese Petroleum Corp., EDRI of Chinese Petroleum Corp., as well as museums and research institutes from other areas in the world, including the Canadian Museum of Nature, University of Alberta in Canada, Carnegie Museum of Natural History in the US, University College London in the UK, and Institute of Geology of Chinese Academy of Geological Sciences. The results of



Geology collection room.

research have been published in important academic journals such as Nature, Science and Chemical Geology.

In line with the development of the Museum, the Department members also participate in and provide prompt support for educational activities related to geology, such as the formulation of the teaching plan for geological theaters, the Naturalist Center series speeches, educational training for on-site interpretive guides, geological workshops of Traveling in Nature, writings of popular science articles and books. As a museum is part of the utility business, the current trend in the world is for the museum to present its collection with digital media through computer technology in order to realize resource sharing and knowledge promotion. To this end, the Department is committed to the digitization of the geological collection by using a helpful financial support from the National Science Council for "National Digital Archives Program, Taiwan," a five-year project. With the joint efforts of the Department members for three years, the Program sub-plans of the vertebrate fossils, minerals, invertebrate fossils, and igneous rocks have been completed. The digitized collection is now available online. The entire collection has been classified into different groups. With the establishment of digital images and relevant background knowledge, users can browse the collection through the Internet. As a result, access to the Museum's collection and relevant collection knowledge can be extended without limitation. These digitized resources can further create more potential applications for the Museum's geological collection. In the next two years, we will continue to digitize the collection of metamorphic rocks, sedimentary rocks, microfossils, plant fossils, and drilling cores. We will strive to construct a digital museum which aims to realize "Knowledge management" and "Information dissemination."



Collection room of core drilling and large geological specimens.

The establishment of the Geology Hall is part of the “Social Education Institutions Service Upgrade Project” of the Ministry of Education. In consideration of the content and attributes of the Museum's geological specimens, the exhibit's space of first floor and the basement of the Global Environment Hall will be rearranged and divided into three exhibit galleries, including The Minerals Gallery, The Dynamic Earth Gallery, and The Paleobiology Gallery. Each exhibit gallery has its own display content and can be connected to each other at the same time. The Geology Hall will offer featured exhibitions to mainly display real specimens while providing texts, models, and images for more detailed explanations. The Geology Department will be responsible for planning the exhibit content and purchasing the exhibit specimens for the featured exhibitions. The Exhibits Department will take care of the planning, design, and decoration of the exhibit hall while the Science Education Department will be designing relevant educational activities. The completion of the exhibit hall will be the first themed “Geology Hall” with regular displays in Taiwan. The holistic perspective from Earth Science allow the visitors to further explore the mysteries in nature through the understanding of the formation of the earth, environmental changes, evolution of life, and symbiosis among creatures. The Geology Hall will serve as the best place for people in Taiwan to go for life-long learning, community education, and the outdoor Earth Science education. In addition, the Department staff has planned for or participated in several important special exhibitions and presentations, including the “Exhibition of Ichthyosaur Fossils,” “Special Exhibition of Flying Dragons,” “Gems & Jewelry Exhibition,” “Tucson Show: A Collector's Pilgrimage of Gem and Mineral,” “Exhibition of Crystal,” and “Science Week: Special Exhibition of Shapes.” The



Special Exhibition of Flying Dragons.

Department has also participated in the modification and review of the Exhibit Plan and Design Project of the “Earthquake Images Hall” and “Fault Hall” of the 921 Earthquake Museum of Taiwan.

In foreign museums of natural history, the collection, research, education, and exhibit in the geological field are considered very important. Although the National Museum of Natural Science is still young, we have introduced a very good system and formulated strategies for the overall development of the Museum. The infrastructure construction of the collection and research areas has almost come to an end. Looking into the future, we shall continue to tap into resources outside the Museum and look for more opportunities for collaboration. It will remain the common objective of the Department members to increase the geological collection and enhance our research standards.

Paleontology Division

Cheng, Yen-Nien

Curator / Chief of Paleobiology Division

Under the supreme guiding principle of the Museum, the Museum staff follows the top leaders' instructions in collection, research, exhibit, and science education activities. It is our objectives to strive for excellence and aim for sustainable development. Over the last two years, the search for cruciae specimens for permanent display in the Geology Hall is the top priority in our collection and research assignments. In particular, the major focus has been on the establishment of systematic collection of the ancient elephant fossils of the Cenozoic era and the marine reptiles the Mesozoic Era. At the same time, the project of Diapsids reptiles studies has been continued. During these two years, I worked with some foreign scientists to study the correlation between the changes to the continent/sea and the faun variation in the eastern part of the Paleotethys between the Triassic and the Jurassic periods of the Mesozoic Era. Initial results have been achieved. I also studied Pachypleurosauria family in *Sauropterygians* of Diapsids to explore their ontogeny and phylogeny. In addition, I conducted analyses of ancestral species of Archosauriform group of the Triassic period and for the reproduction strategies of dinosaurs at the Late Cretaceous period.

Wang, Shih-Wei

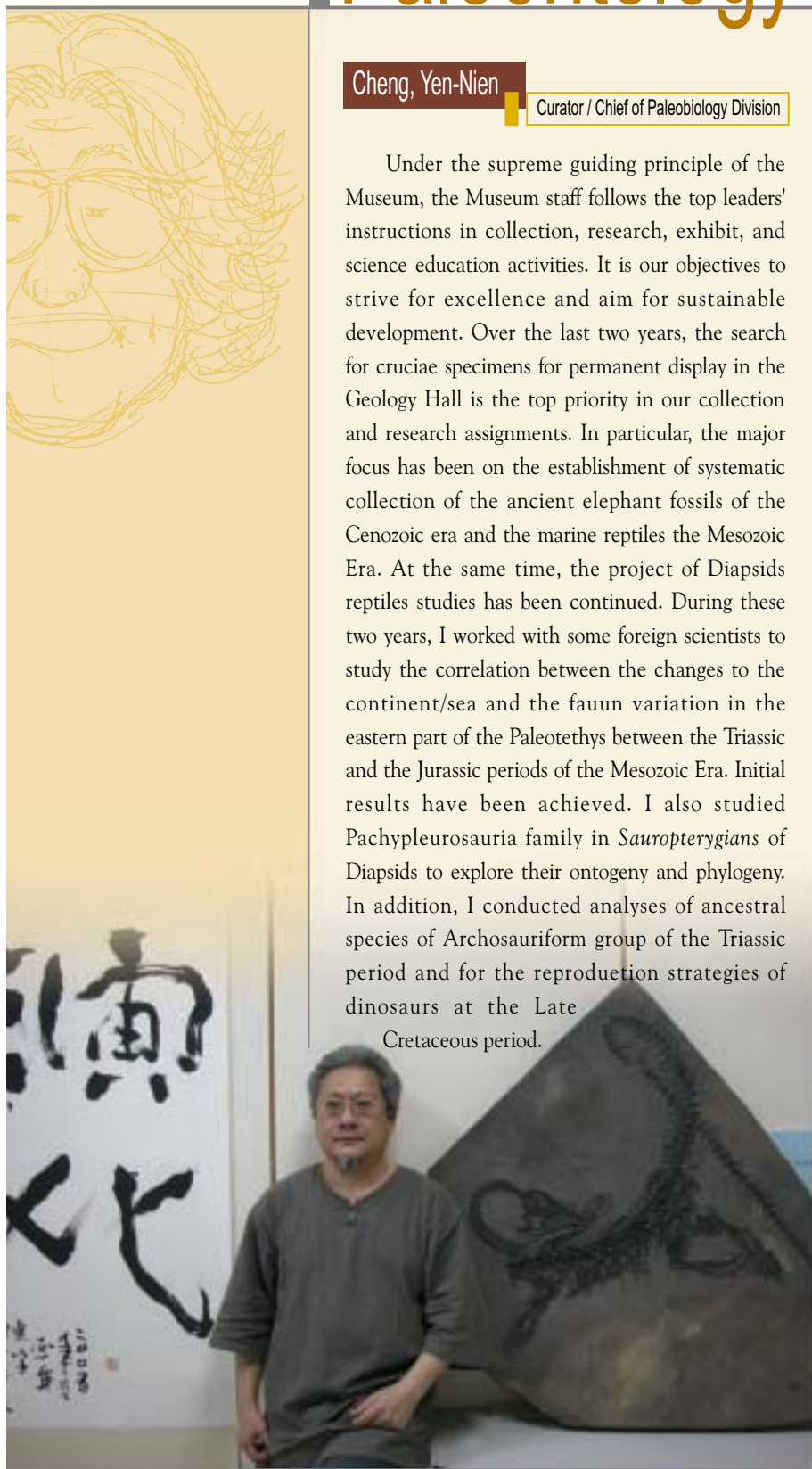
Assistant curator / Drilling Core Collection Manager

Since 1991 when I joined the Museum as an associate researcher, I had been responsible for the collection and management of paleontological specimens. In May of 2003, I was appointed to hold a concurrent post of Drilling Core Collection Manager.

My responsibilities include the maintenance of collection environment; renew of the labels on the collection shelves and drilling core boxes; registry, checkup, collection space allocation of the drill cores; annual checkup with the staff from the Registrar's Office; and the establishment of the source data files for specimens and the digital image database. In addition, I helped with the collection and registry of paleontological and sedimentary rock specimens.

I also provided support for science education and exhibitions, including writing for the Museum's periodic publication, giving geological speeches at the Naturalist Center, providing support for the field teaching organized by the Museum as part of science education, examined the specimens transferred to the Museum by the Naturalist Center, answering phone and written enquiries, and carrying out the sub-plans of invertebrate fossils as part of the geological sub-plan in the National Digital Archives Program from 2003 to 2005.

It is my academic interest to explore the Cenozoic fossil reefs in the southwesten Taiwan. In recent years, I have been working with Professor Dai, Chang-fong of the Institute of Oceanography of National Taiwan University to study the initial development of the Pleistocene fossil reefs in southwestern Taiwan. Based on this study, cold-seep carbonates were recognized for the first time in the Taiwan region. Extensive research and collection of the cold-seep carbonates and associated fossils are in progress.



"Flying Dragons" Exhibition: *Microraptor* SP.**Shan, His-Yin**

Assistant curator / Paleobiology Collection Manager

Over the recent years, the Paleobiology Section has been dedicating to collect the crucial specimens for the display of the planned Geology Hall. With this principle in mind, the Section purchased some specimens over the last two years. In the beginning of 2003, we obtained the Triassic Ichthyosaur from Guizhou, China. This four-meter long specimen is important in studies of the lineage of marine reptile and magnificent for display. In the end of 2003, four pieces of dinosaur fossils were purchased, including the skull of Tarbosaur, skull of Ankylosaur, group remains of Oviraptors, and the skeleton of little Tyrannosaur. They were displayed in the Dinosaur Hall in the Museum. In the beginning of 2004, the fossil of *Microraptor gui* and a skull of Mosasaur were purchased from Tucson in the US. The former was the well-known "four-winged dinosaur" which revived the century-old debate on the origin of flight. The latter was a kind of huge marine reptile which existed in the end of the Cretaceous. Mosasours belonged to the Order Squamata, same as their closest living relatives, lizards. The one meter long skull should be a magnificent exhibit. In the end of 2004, three pieces of fossil elephant, four pieces of marine reptile fossils and one piece of crinoid fossil were obtained. All of these are excellent exhibition items. It should also be mentioned here that the Department of Geology of National Taiwan University donated more than one thousand pieces of fossil mollusks to the Museum. As those specimens have mostly been identified, they are valuable for science education and specimen comparison.

In terms of science education and exhibition, I have been supporting the summer camp of "Nature Field Trip", the special exhibitions of "Sea Dragon project", "Flying Dragons", "Tucson show", and translation of the popular science book titled "Trilobites: Eyewitness to Evolution."

Chang, Chun-Hsiang

Assistant curator

I have served in the museum since 1993, specializing in the collection and research of vertebrate fossils. The collection and research work includes field collection and maintenance of fossils, management of the paleovertebrate laboratory, acquisition of fossils nation and worldwide, management of fossil specimens donated and transferred from other institutions or individuals, and excavation and treatment of the skeletons of large mammals donated by zoos and individuals. I focus my studies on the Elephantidae in Quaternary in the Far East by carrying out a series of systematic studies on biostratigraphy, evolutionary taxonomy, and palaeoecology as well as the species and structural features of mammals. Also, I work with research institutions in China, Japan, and the UK to study mammal fossils. In addition to research, I assisted the Museum in the planning of special exhibitions and science education activities including the "Cambrian Explosion Special Exhibition" in 1996, "*Bubalus teilhardi* and *Palaeoloxodon* sp. Special Exhibition" in 1996, "Special Exhibition of Year of the Tiger" in 1998, "Turtle Special Exhibition" in 1998, "Special Exhibition of the Treasure in the La Brea Tar Pits" in 1998, "Scientific Exploration Special Exhibition: Dinosaurs and Birds" in 1998, "Dancing with Dinosaurs Special Exhibition" in 2000, and "Huge Extinct South American Mammals from the Late Quaternary" in 2001. I further participated in the planning and preparation of the classroom theaters and teaching plans for demonstrating guided tours (the series of the earth science class: "Fossil Mammals" in 1997, "Characteristics and Evolution of Fossil Elephants" in 1999, "Walking Patterns of Mammals" in 2002, "Exploration of *Palaeoloxodon* sp. Fossils from Penghu Channel" in 2004, and "Tyrannosaurs, Scavengers or Predators?" in 2005). In the future, I will put more effort in studying vertebrate fossils and promoting academic exchange and collaboration with other international museums, hoping to enrich fossil research in Taiwan.

Rocks and Minerals Division



Ho, Kung-Suan

Associate curator / Head of Geology Department
/ Chief of Rock and Mineral Division

Over the last two years, I have been studying the trace elements of geochemistry of peridotite xenoliths in order to explore the rock constituents, chemical characteristics of minerals and deep geological processes in the upper mantles in southern China, Taiwan, and Penghu areas. I received support for this research project from the National Science Council and worked with Professor You, Chen-feng from the Department of Earth Sciences of National Cheng Kung University. I mainly collected the peridotites, pyroxenites and granulites xenoliths from Penghu Islands and Hsinchu area. Moreover, I went to North China and Inner Mongolia to investigate and collect volcanic rocks in 2004. This is also part of my own research on the genesis of volcanic rocks on the eastern continental-margin of Asia. With the collection of a series of volcanic rock specimens, I can work on the systematic analysis and examination of the eruption ages, chemical characteristics, and formation mechanisms of volcanic activities as well as the geochemical characteristics of the magma source region.

Apart from being the Head of the Department to take care of the administrative work, I have also participated in the organization of the geological workshops of Traveling in Nature, given geological

speeches at the Naturalist Center, written articles and books of popular science, and taught in the General Education in Tunghai University to promote the geological education. As the Museum carried out the "Social Education Institutions Service Upgrade Project" to establish the Geology Hall in 2004, the Museum received some support which allowed the Department to purchase many valuable geological specimens to increase the scale of our geological collection. I was responsible for planning the mineral exhibition in the Geology Hall. In 2004 and 2005, I went to Tucson in the US with other colleagues in the Department to purchase a large amount of mineral specimens required for exhibition.

The digitization of the geological collection of the Museum is part of the "National Digital Archives Program" implemented by the Museum. Apart from being responsible for the sub-plans related to minerals, I am the convener of the geological group for the Program. My given responsibility is to determine the common tasks and guiding principles of the digitization to establish a communication platform for geology related institutions.



Stibnite crystals on matrix, 60 x 35 x
26 cm, from Wuning, Jiangxi
Province, China, Zhang, J. Y. photo.



Juang, Wen-Shing

Curator

My research focuses have been the granite in the orogeny of Yanshan in the Mesozoic Era on the two sides of the strait, including (1) the granite inclusion in the andesite of Lanyu; (2) the granite and granitic neiss in the metamorphic rock area of Central Mountains in Taiwan; (3) the granite in Kinmen; (4) and the granite in Matzu. I work on the study of the geochemical peculiarities, petrological attributes and Rb-Sr and K-Ar isotope dating of the granite type rocks from different sources in order to further understand the formation and composition of these rocks. I have completed the granite studies in Lanyu, Yuan-toushan in Nanao, and Kinmen. Among these studies, discoveries of the alkali granite in Kinmen and tonalite xenoliths in Lanyu are considered major breakthroughs.

I implemented the petrological sub-plan (of igneous rock) in the National Digital Archives Program in 2004 and found the typical neck joint structure of volcano rocks at the Eastern Coastal Range. I then identified a complete geological pattern of the crater in the volcano area in eastern Taiwan (including the Eastern Coastal Range, Lanyu, and Green Island). I also asked East Coast National Scenic Area Administration to establish the Volcano Crater Reserve of Dafengfeng in Taitung. The pillar shape joints of volcano rocks were also displayed in the Special Exhibition of Shapes in 2004.

Gong, Shou-Yeh

Associate curator

In the past two years, I have focused on two research projects: Dolomitization on Itu Aba Island of Spratly Islands and "Carbonate cementation caused by hydrocarbon in oxygen-free environment." The first research is the continuation of the Our carbonate studies on Itu Aba Island. Our studies found that the dolomitization on Itu Aba Island and other islands terminated in the early Pleistocene, which has interesting geological implications. The second project is a new research topic which catches a lot of international attention because the research results are very likely to provide clues to the atmosphere and biological evolution of the earth in the early days as well as whether there is life on Mars.

In terms of specimen collection, I gathered almost two hundred grab samples of benthic marine fauna from the shallow seabeds in Penghu for the Zoology Department. I also went to Tucson in the US with the Chief Ho, Kung-suan to purchase a batch of mineral specimens; purchased a batch of Mars and moon meteoric stones; and helped with liaison and arrangement of some 700 rock, mineral, slice specimens, and 54 geological maps from the Japanese colonial period and a batch of geological literature left by Professor Yen, Tsang-Po from National Central University. The donation from Professor Yen is particularly valuable.

Regarding the science education aspect, I participated in the organization of permanent exhibitions such as "Image Gallery of Earthquakes," "Fault Preservation Gallery" of the Earthquake Museum, and the planning of the permanent exhibition "The Dynamic Earth." In addition, I took part twice in the natural workshops for high school students in Sitou.

Tung, Kuo-An

Curatorial assistant / Rock and Mineral
Collection Manager

I have continuously taken part in the large integrated research projects of the National Science Council (NSC) including the research of metamorphism and igneous activity in Qilian Mountain, situated in the northwest of China. Thanks to the research projects of the NSC, I am able to systematically collect Pre-Cambrian rock specimens in the north of the Tibetan Plateau and publish my comprehensive studies in the foremost international journals, which not only enhances the collection's quality, but also enhances the Museum's credibility through published research papers.

I also developed a geologic image database which includes (1) rock and minerals, (2) paleobiology, and (3) topography and geological structure. Furthermore, I digitalized the images to help the Geology Department collect fossil images in a systematic order.



Collecting fluorescent minerals: calcite and willemite from the Franklin, New Jersey, U.S.A.

Major Collection and Research Results

I. The New Important Research Result

“A Triassic female marine reptile *Keichousaurus hui* gave birth to live young (viviparous) 230 million years ago”

Finally, the truth is revealed. Pregnant reptiles illustrate how their prehistoric ancestors gave birth.

The two extremely rare fossils of pregnant marine reptiles from middle Triassic of the Mesozoic Era are carefully housed in the NMNS indicating that this type of marine reptiles gave birth to live young (viviparity). Therefore, paleontologists denied the possibility that they came ashore to hatch eggs. The fossil reptiles *Keichousaurus hui* had been expedited by the evolution of a movable pelvis, which helped the mothers bear live young. Each fossil specimen preserved to six embryos.

This fossil discovery has been the first evidence to directly prove and elaborate on the reproduction strategies and methods among Sauropterygians (including Ichthyosaur and *Plesiosaurus*). Sauropterygians were the largest and the most diverse group of animals amongst the marine reptiles in geological history. They lived from 250 to 65 million years ago dominating almost the entire Mesozoic Era. Since the first description of a *Plesiosaurus* in 1821, thousands of related Sauropterygian marine reptile specimens have been collected all over the world (including the Mesozoic in China). However, no direct evidence has been detected to determine whether they came on shore to hatch eggs (oviparity) like sea turtles, or gave birth in the water to live young (viviparity) like the Ichthyosaurs (1846) and Mosasauroids (2001). Even though many scientists have proposed hypotheses and speculations about viviparity, which occurred in *Plesiosaurus*, *Pachypleurosaurs* (including the *Keichousaurus* in this report) and *Nothosaurus*, there has not been direct and effective evidence to prove that they are right so far.

This study is based on the two gravid specimens (NMNS-cyn2002-01 and NMNS-VL191, respectively) of *Keichousaurus hui* Yong

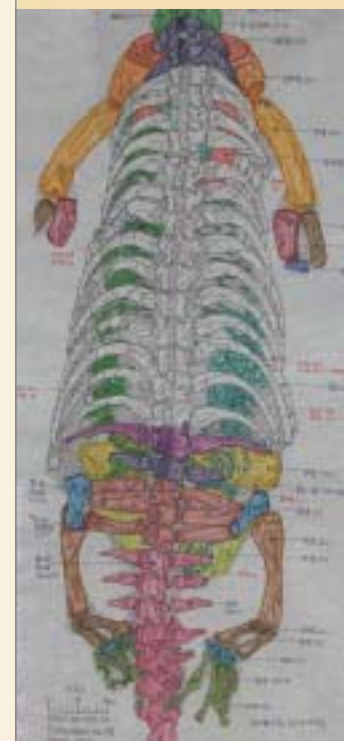
(1958) excavated from the Guanling Formation near Sinyi, the province of Gueijhou, China in the late Middle Triassic (Anisian-Ladinian, 230 million years ago). These specimens are extraordinarily well preserved. They provide clear evidence of sexual dimorphism in Sauropterygians, and indicate that Sauropterygians and their close relatives did give birth to live young in water (viviparity). The findings further help researchers imply that the presence of a movable pelvis (the attachment between the pelvic girdle and the sacrum) in *Pachypleurosaurs* from evolution revealed a possible reproductive pattern. It can be explained that other related Sauropterygian marine reptile species also had a movable pelvis (good for adaptation and movement), which answers questions about their reproductive method. The anatomical feature of the *Keichousaurus* specimens enabled them to bear offspring in the dangerous ocean.

Dr. Cheng, Yen-nien worked on the two specimens with Dr. Wu, Xiao-chun at the National Museums of Canada in Ottawa and Dr. Ji Qiang from the Chinese Academy of Geological Sciences, Beijing, and published the results in Volume 432 of *Nature* in November 2004. After three months of dedicated prepared by Dr. Cheng it is easy to see the embryos in one of the specimens. The other specimen was generously lent from the Paleowonders Mineral and Fossil Museum, situated in Banciao, Taipei for our research purpose. The study indicated that the embryos were in a malpresentation (breech presentation) which led the paleontologists to believe that the mothers died of dystocia.

Why did the reptiles go back to the sea? How did they use locomotion to move in the water? How did they search for food? How did they reproduce and nurture offspring and grow? Were they endothermic? Why did the Sauropterygians go extinct? The answers to these questions need further investigation.



Gravid specimens of *Keichousaurus hui* Yong and the drawings of the specimens



II. Important Rock and Mineral Specimens from Donations

Geological specimens are either collected by the staff or purchased from foreign or domestic specimen dealers. Some specimens are also donated from college/university professors, enthusiastic amateurs, students or the public. Over the past two years, the Museum has received more than four thousand pieces of geological specimens resulting in a diverse and abundant collection, and the Museum expresses its gratitude for the generous donations from all over the world. Here are some examples of donations the Museum has accepted:

(1) Donation made by Professor Chen, Ju-chin

Dr. Ho, kung-suan received a phone call from Professor Chen, Ju-chin in June 2004, indicating that he would like to contribute all the rock and mineral specimens, academic journals, and research papers and books he had collected throughout his life to the Museum. This has been his second philanthropic contribution since 2003.

Professor Chen, a respectable figure in the fields of geology and oceanography, specializes in geochemistry, marine geology, and petrology. He has devoted himself in the Institute of Oceanography at the National Taiwan University after completion of his studies in the U.S. He not only is a good teacher, but also chaired the second-term director of Institute and the president of Geological Society of China located in Taipei. He is a remarkable researcher and keeps good interpersonal relationships with people, setting an outstanding example for the later generations.

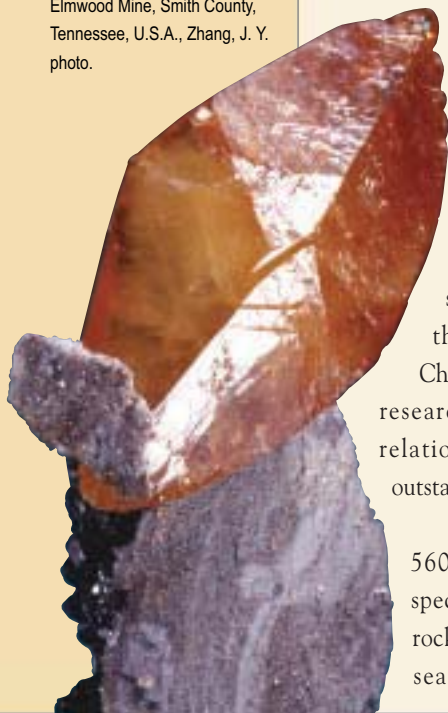
Professor Chen has donated more than 560 important domestic and foreign specimens, powder, and thin sections of rocks and minerals, sediments, and deep-sea manganese nodules as well as 800

research papers and journals concerning geology over the last two years. The Museum was even more impressed and touched by Professor Chen's generosity to send the aforementioned items over on trucks at his own cost. Among the specimens, there are andesite and basalt from Taiwan, Taiwan's offshore islands, Sea of Japan, and the Philippine Sea; granite from Kinmen and Matsu as well as sediment from shallow- and deep seas around Taiwan. Part of the collection is the crucial rock and mineral specimens from other countries (such as the mantle peridotite xenoliths found in the Antarctic), and the deep-sea manganese nodules are rare and precious.

Professor Chen was a pioneer devoting his studies on the manganese nodule in Taiwan. The manganese nodules are deposited by enrichment of manganese, iron, cobalt, nickel, copper, lead, molybdenum, vanadium, and titanium. These metallic elements are essential alloy materials in the industry, which are now in large demand in this high-tech era. Therefore, manganese nodules are regarded as an important mineral resource. "R/V Chiu-Lien" the first marine exploration ship in Taiwan, discovered manganese nodules approximately 10-20 centimeters across on the Philippine Sea floor 2,900 and 5,700 meters deep to the east of Taiwan. Professor Chen and his students carefully studied the mineral composition, chemical characteristics, and growth rates and published many research papers regarding the discovery.

Professor Chen was also of Dr. Ho advisor and has collaborated with and always supported the Geology Department. The Department would like to express its deepest gratitude to him for he has donated his collected specimens and complete geological journals for the Museum's permanent collection. The Museum carefully preserves and manages these properties for the generations to come.

Mineral specimen from purchase:
Calcite crystal on matrix, from
Elmwood Mine, Smith County,
Tennessee, U.S.A., Zhang, J. Y.
photo.



(2) Donation made by Professor Yen, Tsang-Po

In spring 2004, Professor Ma, Guo-fong at the National Central University mentioned that Professor Yen, Tsang-Po left some specimens and literatures in the Institute of Geophysics, National Central University. She asked if the Museum would like to take them in. We were extremely thrilled and took the offer without a second thought.

Professor Yen remains a prominent figure in the field of geology dedicating himself to field surveys of igneous, metamorphic rocks, and mineral deposits. Yen started his studies in geology since the Japanese occupation, and his collection must have been significant. Dr. Gong, Shou-yeh and Wang, Shih-wei spent two days sorting the collection in Jhongli in April, 2004.

Professor Yen's collection of minerals, rocks, and sections totals more than 700 pieces among which include the very rare native gold from Rueifang and Jinguashih, iolite from Lyudao, and zircon from Guansi, Hsinchu, not to mention metallic mineral specimens from Korea and Japan that the Museum never had.

Furthermore, there are 54 well-preserved geological maps, which were finished during the Japanese colonial period, are considered valuable evidence of Taiwan's geological history. Most of the current maps from that time are not well preserved due to regular use. However, these 54 maps look as good as new. They might be the most complete geological maps from early in the history in Taiwan.

Unfortunately, the notes and symbols in the numerous unpublished scripts, working maps and some specimen labels are incomprehensible. It is a pity that later generations cannot understand these clues that reflect Yen's observations and thinking. We should learn from this lesson—keep records of one's research, document and place them appropriately and become the collective properties of human beings. Otherwise, all the time-

consuming studies will not be carried on and will be wasted. To prevent similar disasters from repeating themselves, the National Central University donated these specimens to NMNS, and we are grateful for its generosity.

(3) Donation made by Professor Yang, Houg-yi

Professor Yang, Houg-yi is a well-known petrologist in Taiwan. He dedicated more than 30 years to teaching in the Department of Earth Sciences at the National Cheng Kung University after earning his doctoral degree from Ohio State University. On January 31, 2004, he retired with honors. During decades of teaching and research, he focused on petrology, geochemistry, and refractory materials. In recent years, he led one of the NSC's large-scale integrated projects—a study on the mineralogy of igneous and metamorphic rocks in the Cilian suture zone. He should be given credit for the development of Taiwan's studies on rocks and minerals.

One or two years before Professor Yang's retirement, he managed thousands of rock and mineral specimens that were used for research and contributed them to the Museum. In addition to the igneous rocks from Taiwan and Penghu Islands, there are mineral specimens from Chungbuk, Kyonggi, and Busan/Pusan in Korea; molybdenite in Canada; ashes from Mount St. Helens in the U.S. and chromite from Zambales, the Philippines. Professor Yang labeled and proofread the scientific name, field number, and collection locality, and other detailed information of each specimen. He also specified elaborately which specimens had been studied by which students of his, indicating Yang's serious attitude not only toward research samples but also meticulous scholarship and research and setting a good example for us.



Mineral specimen from purchase:
Native copper, 16 x 33 cm, from
Keweenaw Peninsula, Michigan,
U.S.A., Zhang, J. Y. photo.



The crocodile fossil,
Steneosaurus bollensis,
Jurassic, Germany

III. Important Fossil Specimens from Purchases

The Department had gathered a few magnificent fossil specimens over the past two years (2003-2004). In 2003, we obtained a Triassic Ichthyosaur, which was discovered in Xingyi, Guizhou, China. It belongs to the *Mixosauridae* family, but its exact classification needs further study. We obtained it as rock slabs. It took a half year to recover the whole fossil. Part of the recovery efforts were demonstrated in the exhibit hall, so the public could actually see how the fossils were prepared and recovered. This demonstration was very popular. The recovered specimen is a 410 cm long and 230 cm high plate, with a 3-D head stood out of the plate, which is extremely appealing. Another important result in 2003 was the collection of four pieces of dinosaur fossil including the skull of *Tarbosaurus*, skull of *Ankylosaurus*, a buried group of *Oviraptors*, and the skeleton of little *Tyrannosaurus*. They were all excavated from the Cretaceous strata in Mongolia. The *Ankylosaurus* and little *Tyrannosaurus* could be a new species that have never been recognized, and deserve further study. The specimens of *Oviraptors* show that they probably cared for their offspring. The four specimens are displayed in the Dinosaur Gallery now.

In the beginning of 2004, with the subsidies for Service Upgrade Project from the Social Education department of the Ministry of Education, the Division had a crew to the Tucson Mineral and Fossil show in the U.S. to collect the specimens for future exhibitions at the Geology Hall. The most important result of this trip is the obtaining of the fossil of *Microraptor gui*, which was also known as the “four-winged dinosaur” on the cover of the January 23 issue of the journal *Nature*. The *Microraptor gui* was dated at 125 million years old (Early Cretaceous). It had fully developed modern feathers on both the forelimbs and hind limbs. The

finding provided a crucial information on the study of the origins of flight. There are two competing hypotheses that attempt to explain the origin of flight: “tree-down” and “ground-up”. The “tree-down” hypothesis states that the ancestors of birds first lived in trees. They would have sprung from branch to branch to progressively develop the gliding ability. Its proponents speculate that the evolutionary transition to birds include four-winged phases. The “ground-up” hypothesis suggests that birds' ancestors were ground-dwelling animals that would have begun to flap while running at high speed that eventually resulted in flight. The discovery of “four-winged dinosaur” is thought to be a support of the “tree-down” hypothesis. Another significant specimen collected in this trip is the skull of *Mosasaurus*. *Mosasaurus* was a kind of huge marine reptile which existed in Late Cretaceous. Like its closest living relatives, lizards, *Mosasaurus* belonged to the Order Squamata. The 1.2 meters long skull shows two rows of pterygoid teeth at the back of upper jaw. It would be an attractive exhibit.

In the end of 2004, the Division gained another eight pieces of fossils for the future exhibition of the planned Geology Hall. They included mammoths *Platybelodon*, Ichthyosaurs, fossil crocodile, fossil crinoid and the *Thalattosaurus*. *Mammoths* are one of the representing animals of the Ice Age. They are indispensable exhibits in museums and appealing topics in textbooks. *Platybelodon*, known as “shovel-tusker,” was characterized by its huge, shovel-like lower jaw and broad lower incisors. Scientists speculate that the shovel-like lower jaw may have been used to dig into the boggy bottoms and scoop up aquatic plants in the wet prairies. The *Thalattosaurus* fossil is another interesting specimen. With 3-D preserved skull, it is perfect for scientific study and exhibition.

>> Anthropology Department





Angriman Papua New Guinea mwai Mask.

The Anthropology Department of the Museum is divided into three divisions: Ethnology Division, Archaeology Division, and Physical Anthropology Division. Based on the concept of culture and methodology shared, the three fields together comprise museum anthropology by integrating the nature of humanities, biology, and social science.

The Anthropology Department of the Museum aims to collect and research systematically without ruining the regional integrity; be in sync with the trend and effects of the cultural studies of its time; display the diversity of cultures and interaction among them; introduce unique patterns to fit in different ecological environments; protect the social heritage that has been endangered, and promote and develop a better place for culture preservation and evolution. Museum anthropology in Taiwan is to be equipped with the ability to bring the far-reaching world culture back to life to Taiwan's aborigines whose past has long been forgotten.

A museum is the product of civilization. It reflects subtle socio-cultural phenomena. Each part of a museum is closely related. In addition to collection and research, the scope of studying museum anthropology covers exhibition and educational communication. In fact, the themes for the permanent exhibitions at both the Life Science Hall and the Anthropology Hall (Austronesians and Chinese spiritual life) determine the Anthropology Department's personnel recruitment and collection policies.

The collection made by the Anthropology Department includes three categories: (1) ethnographic specimens of Austronesians (Taiwan and New Guinea) and the ethnic minorities in southwest of China; (2) house and temple construction elements, religious artifacts, scripts, pictures, tapes, and videotapes of religious rituals of the Chinese living in Taiwan, Fujian, and Guangdong Provinces; (3) archaeological specimens

found in the Mainland China, Southeast Asia, and Taiwan.

Based on the above-mentioned efforts, the recent research projects that center on Southeast Asia, Mainland China, and insular Southeast Asia include the themes as follows:

1. Salvaging studies on archaeology, ethnoarchaeology, and archaeology of aboriginal sites;
2. Studies of paleoanthropology in China;
3. Central Taiwan's archeological studies of topics including regional ethnography of aborigines and interdisciplinary integration;
4. Collection and research of the artifacts of Han Chinese in Taiwan;
5. Collection of ethnographic specimens of the ethnic minority groups in Southwestern China;
6. Establishment of ethnographic database regarding Austronesian peoples in Taiwan and ethnic groups in Southeast Asia;
7. Studies on anthropology of museum.



Removing trash pit unearthed from Nanshihkeng archaeological site, Shalu County, Taichung Prefecture.



High school students practice archaeology.



Communicating archaeology to the public.

The key mission of museum anthropology is to properly manage and utilize natural and artificial objects, and even more, carry the ability to introspect. Based on ecology, society, and morals, museums attempt to explore the general principles of “how” they exist and operate. They need to think about the reasons they exist. Pragmatism in anthropology enables the professionals of anthropology to serve in museums and bear in mind the political praxis of knowledge.

At present, the Anthropology Department of NMNS puts its focus on collection and research of indigenous specimens in Taiwan. Even though the Department has already had a conceptual plan to construct comprehensive museum anthropology (for instance, establish divisions responsible for regions divided by geology and culture of different continents and set up a laboratory for material culture studies), the plan itself has been limited by the Museum's existing organization and budget. Therefore, the Department has to seek support and resources from both public and private sectors in every possible way; continuously proceed exchanges

and collaboration with domestic and international universities, art colleges, museums, and other research institutions.

In addition to dedication to the digital archives program and research, the two divisions of the Anthropology Department are actively involved in tour guide training programs before the launch of special exhibitions hosted by the Science Education Department, on-site demonstrations for the Naturalist Center, submitting essays for NMNS Newsletter publications, and speeches for tour exhibitions. The researchers of this Department dedicate themselves not only to providing precious exhibits and their background information for the permanent exhibitions, but also participating in renewed projects and composition of introductory statements. In recent years, the research teams in the two divisions under the Department have actively devoted extreme efforts in exhibitions planning, specimens collecting, and exhibiting digital value-added animation for annually large and small special exhibitions.

Archaeology Division

Ho, Chuan-Kun

Curator /Chief of Archaeology Division

The research framework for Chinese paleoanthropology covers the developmental history of ancient apes, homo erectus, and homo sapiens at the early stage and contemporary human beings that inhabited different paleogeographical zones in China from a period dating back to 10,000 years ago to 12 millions years ago. It synthesizes the tangible evidence from paleontology, palaeobotany, physical anthropology, and archaeology during the Paleolithic Period. Accordingly, paleoanthropologists concluded and deduced the life styles of ancient human beings. Taiwanese archaeology has gone through one hundred years of research history. Contemporary archaeologists devote themselves to saving endangered archaeological sites while simultaneously attempting to investigate the history and process of the early immigrants who came to Taiwan during the late Paleolithic and those who came during the early, middle, and late Neolithic.



Two prone burials No.15, 16 unearthed from Hui-Lai Li archaeological Site, Taichung City.



House remains unearthed from Tamalin archaeological site, Puli County, Nantou Prefecture.

Chu, Whei-Lee

Assistant curator

My research includes archaeological site research and archaeological heritage management. I assisted in the Peinan archaeological site in Taitung, the Nan Tun Shan Zih Jiao archeological site in Taichung, the Fu Tian Li archaeological site in Changhua, and the Li Tou Shan archaeological site in Hsinchu County. I have conducted the excavation of Hui-Lai Li archaeological site and has been assisting in the promotion of archaeological education since May 2002. I investigated the Shalu's Nan-shih-keng archaeological site and uncovered the contributions of domestic historians in 2003. In the recent years, I focus my research on the preservation of cultural heritage, interpretation of cultural resources, community archaeology, and the like.



Examining the teeth condition of M6 with a local dentist who has great interest in archaeology.



Tamalin archaeological site.

Liou, Ke-Hong

Curatorial assistant

I have long devoted my research in the investigation and discovery of archaeological sites in Taiwan. I assisted in the rescue, discovery, and data collection of the Peinan and Shih Shan Hang archaeological sites. I was the co-chair of many archeological research projects, including the Cing Shuei archaeological site in Cing Shuei Town, Taichung County, the Ban Tou archeological site in Sin Gang, Chaiyi County, the Ying Pu archaeological site in Dadu, Taichung County, the Lu Liao archaeological site in Shalu, Taichung, among others. In addition, I published two children books on archaeology to introduce the field of archaeology and Prehistory Taiwan to children and the general public.

Ethnology Division

Wang, Sung-Shan

Curator

I have served in the Museum since May 1988, specializing in the collection and management of ethnological specimens, museum exhibition planning and design, and research of Austronesian social and cultural systems. My profound career is listed as follows: assistant researcher (from May 1988 to October 1997), associate researcher (from October 1997 to January 2004), researcher (from January 2004 to present), head of Exhibits Department (from February 2004 to April 2005), chief of Ethnology Division of Anthropology Department (from August 1997 to present), and editor-in-chief of *Museology Quarterly* (from February 2002 to present). I received my B. A. degree and M. A. Degree from the Department of Anthropology at National Taiwan University and doctorate training from the Institute of Social and Cultural Anthropology at the University of Oxford (Ph. D. candidate, from 1993 to 1997).

I focuses my study on the Oceanic Language, specializing in Austronesian social and cultural systems, cultural forms, museum anthropology, collective knowledge and society, political anthropology, and historical anthropology. I had been an instructor and associate professor at various institutions, including the Department of Anthropology at National Taiwan University, the National Taipei College of Nursing, the Department of History at Tung Hai University, and the Graduate Institute of Adult and Continuing Education at National Chi Nan University. I currently works as a professor at the various universities, including the Department of Fine Arts at Tung Hai University, Graduate Institute of History and Historical Relics at Feng Chia University, and Department and Graduate School of Cultural Heritage Conservation at National Yulin University of Science and Technology.

Liao, Zih-Jyun

Assistant curator

I am in charge of the collection and management of ethnological samples. The early collection focuses on the religious specimens of the aboriginals and those of the Hans in Taiwan. The 2004 new collection exceeds over 1,000 pieces, including Miao clothing and embroidery as well as Oceania utensils. The new items have been digitized and will soon be presented to the audience via exhibitions, publications, and educational activities.

My research interest has shifted from the preventative perseverance and maintenance of cultural resources to collection research. My research area focuses on Han religions, specializing in folk religious research and the boat burning ceremony. Furthermore, I have expanded my research interests to include specimens of Miao clothing.

In addition, I have assisted elementary teachers and junior high school teachers in conducting indigenous and diversified cultural education training programs to establish cooperative rapport between the museum and educational institutions.



"The Art of Porcelain Inlays" Exhibition.

Major Collection and Research Results

I. New Prehistoric Discovery in Taichung City: Hui-Lai Li Archaeological Site

Located at latitude 24°09'58" N. and longitude 120°37'50"E., Taichung City's Hui-Lai Li is in Situn District in terms of administrative district; situated in the west of Taichung basin in terms of geography. Hui-Lai Li is at an elevation of 70 meters, and the west of the site overlooks the Dadu basin and Nantun District. The Archaeology Department has started to excavate and investigate the archaeological sites at the intersection of Shihjheng Road and Huilai Road as well as the No.144 City Government *difei* land area at the intersection of Shihjheng Road and Henan Road since 2002. The finds include artifacts belonging to Niu Ma Tou Culture and Fan Zih Yuan Culture, which was dated 1,300 years before present. Hui-Lai Li extends to Shin Kong Mitsukoshi De-partment Store, Tiger City, and other famous shopping centers as well as the designated land for the City Government's new buildings. The area of unearthened remains covers at least 150,000 m².

The artifacts of Hui-Lai Li were distributed nearby Fazih River. The random excavation around Huilaicuo Section along Henan Road indicated that Hui-Lai Li Archaeological Site had been of a dwelling place with a huge population during Niu Ma Tou Culture. In 2004, the jade rings and ceramic shards representing Ying Pu Culture were discovered in the designated land area for the City Government's buildings. The jade ring was made of materials available in Hualien. At No.144 City Government *difei* land area, a large quantity of stone tools, raw stone materials, stone hammers, and stone knives, indicating that iron wares were not prevalent at that time. As the ash pits, animal bones, carbonated unpolished rice, and 19 prone human burials unearthened show, the inhabitants in the village 1,000 years ago were a mainly agricultural people who fished, hunted, and gathered to supplement their food supply from

farming. The finds serve as the first-hand evidence for scientists to probe into the life of the Iron Age villagers in Taichung basin, especially around Fazih River area.

It has been identified that the animal specimens excavated in Hui-Lai Li are birds, rabbits, deer, Formosan Reeve's muntjacs, *Meles meles Linnaeus*, and *Herpestes urva*. The *Meles meles Linnaeus*, which have been extinct in Taiwan, are part of the *Mustelidae* family.

Was the ancient Taichung basin a lake or wetland? Further in-depth investigation is required in order to unveil this myth. Information related to paleoecological settings should be collected to identify the cultures and spatio-temporal distribution of Hui-Lai Li Archaeological Site. Next, the relationship between Niu Ma Tou Culture and red cord-marked pottery culture in north and south areas is to be explored; how Ying Pu Culture, Fan Zih Yuan Culture, and Iron Age were related should be discussed in detail as well.

Since Hui-Lai Li Archaeological Site was first excavated, the event involved in a wide range of levels from central and local educational authorities, necessary personnel such as the Mayor or the mayor candidates, archaeologists from other institutions, representatives of the people, borough wardens, the general public, students of primary, junior high, senior high schools, and universities, local cultural heritage workers, news and magazine publishers, and mass communication professionals, and the staff of the Department. The whole event best illustrates a modern version of "archeological efforts in the metropolis".

While the excavation was still underway, the Museum launched two exhibits "The Lost Prehistoric Hui-Lai Man" and "The Story of Ancient People in Taichung" as well as activities like "A Root-Seeking Trip in Taichung" and "Life Learning: A Journey to the Past-Archaeological Class" so as to boost the public's insight for, and



Introduce Hui-Lai Li site to visiting archaeologists.

understanding and appreciation of the cultural heritage, and hence, become proud of their own culture. Through these carefully planned classes, the general public could have a glimpse of the nature science of “archaeology” and prehistoric cultures of Taiwan. By visiting the archaeological site, they could visualize the knowledge they acquired on books. The Department hopes to spread and instill respect for cultural heritage in the younger generations, so that people are aware of the importance to preserve the archaeological sites.

II. New Archaeological Discovery

During the Japanese colonial period, Mori Ushinosuke was the first scholar who climbed Mount Ali (Alishan) and investigated archaeological sites.

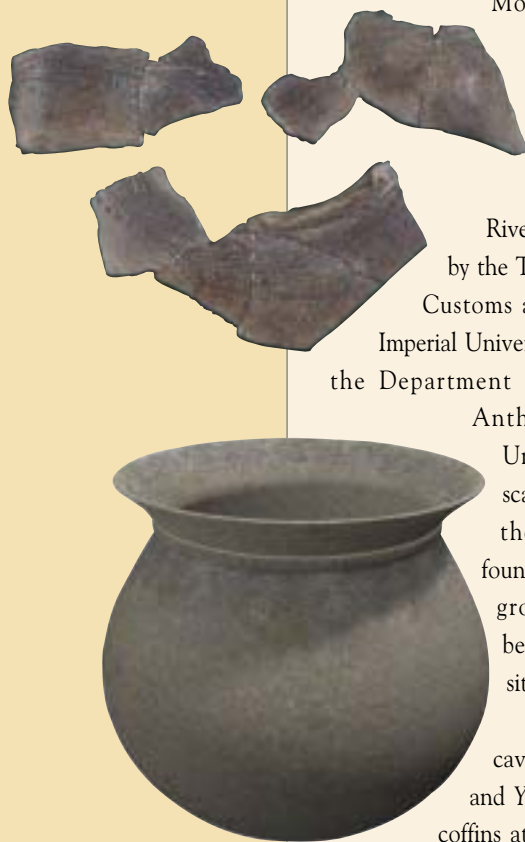
He found chipped and grounding stone implements and ceramics in six localities upstream of the Zenwun River. Five of them were inhabited by the Tsou People. In the 1930's, Folk Customs and Ethnology Classroom of Imperial University, Taipei (the predecessor of the Department and Graduate Institute of Anthropology, National Taiwan University) conducted a large-scale research project focusing on the mountain aborigines and found stone axes and hoes on the ground, among which nine belonged to the archaeological sites in Alishan Village.

In 1941, Kano Tadao excavated at Tsou sites such as *Vuyio* and *Yingana*. He found several slate coffins at *Vuyio*; red and black ceramic sherds with cobweb patterns and thick plain ceramic sherds with quartz grains at both sites. As

for stone implements, in addition to thin chipped stone axes, there were flat grounding adzes, narrow adzes, and grounding arrowheads. He believed that these artifacts were used by the Tsou's ancestors.

Archaeological efforts in the Mount Ali area slowed down after Taiwan's Retrocession, but resumed in 1993. Researchers from the Institute of History and Philosophy, Academia Sinica carried out a systematic archaeological exploration along the upstream of Zenwun River. They discovered another 15 sites and re-excavated the *Yingiana* site. Since 1997, researchers at the Department have consistently conducted investigations and test excavations in this mountain area. To date, more than 40 sites have been recovered. The test excavation took place in the border of *Veiyio* site (the *Vuyio* site was discovered by Kano Tadao in 1941) called “*Daimaeyayan* (spelled as *Tamayayana* in the Tsou's language).” To ensure the chronological order of prehistoric cultures in Mount Ali, archaeologists conducted a series of large-scale excavations at the *Taptuana3* and *Niahosa* sites from 2002 to 2003. These efforts, for the first time, have confirmed the existence of prehistoric cultures in this mountainous area, which could be classified into two layers: *Yingiana* Phase I or early cultural layer characterized by red cord-marked wares (about 3,800 years B. P.) and the *Yingiana* Phase II or later cultural layer featuring plain red and brown wares (900 B. P. to 200 B. P.).

The red cord-marked pottery from the mid Neolithic Age, *Yingiana* Phase I (the second cultural layer) represents the earliest human culture in Mount Ali. According to carbon-14 dating test, the *Yingiana* Phase I is approximately 3,800 years old, which means that the aborigines who owned the red cord-marked pottery culture moved inland from the coastal terraces approximately 4,000 years ago. They were everywhere, expanding from hills, small mountains, and even river terraces in the



Grey-black sandy wares recovered from the upper Phase, *Yingiana* Phase *Cayamavana1* site.



Both sides of pierced jade beads, Yingiana Phase Veiyu Site, Mt Ali.

Side view of a jade bead.

mountains. These findings have contributed greatly to the research of prehistoric peoples' upland expansion on the island.

The culture of plain red and brown wares with sand belonged to a cultural group that closely interacted with its neighboring groups. In addition to the same remains as those unearthed in *Yingiana* Phase II, the jade ornaments and bracelets, exclusively available in the Peinan Culture, were discovered at *Veiyu* site in the late Neolithic Age. Also, at *Niahosa* site, researchers uncovered serpentine arrowheads, which were not commonly seen west of Taiwan's Central Range. As the evidence indicates, the people who created the plain red and brown wares during the late Neolithic Age in Mount Ali already had frequent interaction with people on the east coast.

III. Miao's Dangling Leg Houses

Dangling Leg Houses, the traditional architecture of Miao's housing, have unique characteristics. Dangling Leg Houses use wood selected from local areas and utilize small areas of land. They are spacious, beautiful, and cool in the summer and warm in the winter. Dangling Leg Houses are popular among the Miao mountainous communities in Gueijhou, Hunan, and east Sihchuan.

The Dangling Leg House in the Museum comes from Jhanghua Village, Pinglyue Town, Jinping Prefecture, in Gueijhou Province, close to the Cingjian River. This Dangling Leg House, in the resting mountain style with the holding wooden



frame, is over ten years old. The Dangling Leg House, with a floor space area of 85 ping (equivalent to 280 m²), contains three stories. The ground floor is used to raise livestock and as storage space. The second floor is used as living quarters, with three halls. The hall in the middle is the main hall, where ancestor-worship ceremony, meals, and the receiving of visitors take place. The two side halls are then divided to bedrooms, guest rooms, heating room, storage, and hallways. The top floor is the attic used to hang clothes to dry and as storage space for grain.

The houses are originally built on slopes. Before the house is constructed, a two-story platform is built, and the stairs are made of solid pebbles to form strong resistance and protection. The house then is built on the solid two-story platform, approximately 100 m².

The outermost post hangs from the top floor and seems to be suspended in midair, without reaching the bottom floor, creating a "dangling leg" effect. Therefore, the houses have been coined, "dangling leg houses."

The roof constructed of China fir is used to prevent the outer wall from deterioration caused by heat and rain. The dangling legs are decorated with carved golden paws for aesthetic effect. The cozy patio in front of the main hall is furnished with a long leaning bench, known as "beauty bench." This is the favorite place of the Miao people, where they rest, appreciate the scenery, and welcome their friends.



A jade ear ring, Yingiana Phase II, Mt Ali.

The New Collection of the Miao People in the Anthropology Department

In order to strengthen the folk collection of minority groups in Southeast China, in 2004 the Ethnology Division of the Anthropology Department purchased more than 1,000 pieces of a Miao collection, including embroidery, clothing, and one Dangling Leg House. The Miao collection comes from Hunan, Guangxi, Gueijhou, Yunnan, Sihchuan, Hainan, and other provinces. By comparison, the richest collection draws from the southeastern Gueijhou, where most of the Miao people reside. Southeast Gueijhou located east of Yunguei Terrain is the dividing line for the Yangtze River and Jhujiang River. The water area is simply divided into the Cingshuei River system in the north and Duliou River system in the south. The early collection in the Anthropology Department mainly comes from the Cingshuei River Area, with approximately more than 400 pieces mostly from areas in Shihbing, Taijiang, Danjhai, and Leishan. Particularly, the Museum has a rich collection of embroidery pieces from the Shihdong Area. The 2004 new collection not only increases the number of clothing and embroidery products of the Duliou River System but also enriches the Museum's clothing collection from areas in South Gueijhou, northwest Gueijhou, northeast Gueijhou, Yunnan, and the like.

The registration method of the new Miao clothing collection follows that of the 1985 ethnological cultural system, dividing the Miao clothing into more than 80 styles with one or two specimens per style. The naming of the style follows the place name of its administrative village and township. The registration method is based on that of the Miao language. The different groups of the Miao are distinguished by the distinct colors used in clothing. Nevertheless, the relevant issues dealing similarities with other cultures remain unsolved. By comparison, the 400 specimens of the Miao's early



Miao's embroidery from Hsi Chiang.

collection were categorized according to each village. Although the new registration method eliminates complexity and confusion, more detailed information shall be provided for better understanding.

The Dangling Leg House stored by the Anthropology Department is the first and the only one in a museum collection in Taiwan. It came from Jhanghua Village, Pinglyue Township, Jinping Prefecture, Gueijhou Province, belonging to the Cingshuei River System. Due to the current construction of a water dam, the village had to be moved elsewhere. Accordingly, the Dangling Leg House was purchased by the Anthropology Department.

Our rich collection in embroidery, clothing, the Dangling Leg House, utensils, and the others indicates our determination to cross-cultural research. The material culture of the Miao people embodies the significant elements of their traditional and modern life styles. In addition, the underlying symbolic system reiterates the thinking pattern and cultural logic of the Miao people. Furthermore, the beautiful and rich cultural resources properties are not only works of art but also the records of the Miao people's migration history.



>> Collection Management
Department

Workshop on collection research and management of the Nature Center of Taiping City



Management of Museum Collections forward the New Century Seminar: Lab training on crating and packing of collections.

When the Institutional Amendment was approved in 1997, the Museum followed the experience of the U. S. museum in setting up a Registrar's Office to set up the Collection Management Department. This is the first office specializing in 'collection' and 'management' among all museums in Taiwan.

In terms of operation of the Museum, the Department can be considered the administrative center for collection and research as well as the heart of collection operations. It not only is engaged in studying collection policies and operational procedures, but also is responsible for coordinating and planning the most appropriate environments for collections. There are total of five members in the Department: the director, administrators and two curatorial assistants who keep official records, take care of the collection, and matters relevant to

specimen lending, borrowing, transporting, and specimen insurance.

Starting from nothing, the Museum's collection has grown to more than 700 thousand items. As a result, activities regarding the collection have increased gradually. Furthermore, due to the organization of a diverse set of exhibitions and frequent exchanges with other museums, the Department, with its limited manpower and tremendous teamwork, has completed all the work related to the collection and management of specimens and cultural relics in the "Treasure in the La Brea Tar Pits Special Exhibition," "Dunhuang Cave Shrine Special Exhibition," "Search for Immortality: Life and Afterlife in Ancient Egypt Exhibit," "Dancing with Dinosaurs Special Exhibition for the Year of the Dragon," "Retrospective Exhibition of Collections," "Terra-

cotta Warriors and Horses of Qin Shihuang Exhibit,” and “Spirit in Stone: Gems & Jewelry Exhibition” from 1998 to 2004. During the same period, the Department also stipulated the “Regulations Governing Loans of Images from the Collection and Research Division” and organized the “New Era of Museum’s Collections Management Seminar (1999)” and “Management of Museum Collections forward the New Century Seminar (2003).” Moreover, the Department carefully revised the “Regulations Governing the Storages of the National Museum of Natural Science” and drafted “Seismic and Disaster Prevention and Management of Institutions of Cultural Collections” and “Report on Classification of Exhibits and Security Evaluation of National Museum of Natural Science.” Step by step, the Department is establishing its professional image and a sound system regarding the collection management, and its efforts have started to pay off in communication and coordination as well.

On top of this, the Department is striving to develop conservation science. As it mentioned earlier, the more the collected specimens, the more complicated the problems it will encounter in terms of preservation of collections. With the increase in frequent exchanges of specimens and cultural relics for exhibitions organized all around the world, the Department will see more problems of such. As a result, it is important that all Departments work together to construct a better place to preserve and exhibit collections.

A trip to Japan to accept beetle specimens donated by Professor Sato Masatakai.

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核心的躍昇：蒐藏研究雙年報(92-93年)=
Great Improvement in the Core Collection:
Biennial Report of Collection and
Research (2003-2004) / 周明主編. -- 初版.
-- 臺中市：自然科學博物館， 民94
面； 公分

ISBN 986-00-3009-X (平裝)

1.國立自然科學博物館

300.9232

94022420

核心的躍昇

蒐藏研究雙年報(92 - 93年)

Great Improvement in the Core Collection

Biennial Report of Collection and Research (2003-2004)

國立自然科學博物館 / 出版

臺中市館前路一號

電話：(04)23226940

網址：www.nmns.edu.tw

周文豪 發行人

周文豪 出版委員會召集人

周文豪 王嵩山 何恭算 汪清雨 出版委員

許立如 趙世民 楊宗愈 劉德祥

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周明 主編

莊明賢 林美齡 編輯

舜程印刷有限公司 張麗嫻 美編

哲興印刷事業股份有限公司 印刷

中華民國九十四年十一月 (1500本) 初版

1009403745 GPN

986-00-3009-X (平裝) ISBN

Publishing Organization: National Museum of Natural Science

1, Guancian Road, Taichung 404, Taiwan

Tel: (04) 23226940

http://www.nmns.edu.tw

Publisher: Wen-hao Chou

Advisory Board Chair: Wen-hao Chou

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Managing Editor: Mean Chou

Executive Editor: Ming-shyan Juang, Mei-ling Lin

Designer: Shuncheng Printing Co., Ltd. Li-lan Chang

Printer: Jer Shing Printing Enterprises CO., LTD

Publishing Date: October 2005 (First Edition) (1,500 print run)

GPN: 1009403745

ISBN: 986-00-3009-X