NEWSLETTER

Crocodile Specialist Group

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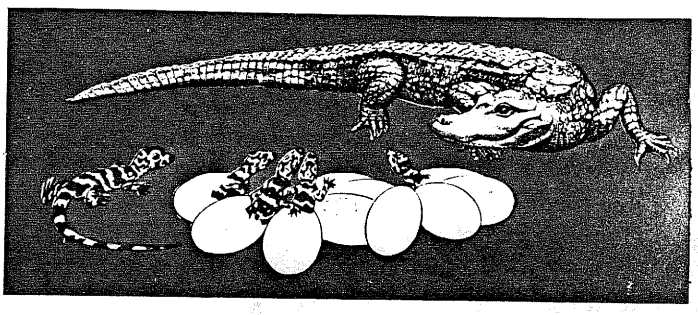


International Union for the Conservation of Nature and Natural Resources

Survival Service Commission

F. Wayne King, Chairman

Editors: Peter Brazaitis and Myrna Watanabe

EDITORS' COMMENTS

It has been more than year since we last saw many of you at the CSG meeting in Caracas and since the last newsletter was written, and much has occurred among the Crocodylia, and in our lives as well. The contents of this newsletter will reflect the progress in the field of crocodiles.

The CSG meeting was a success in that it brought the different sides of several controversies together to exchange ideas and a number of agreements were made. The Northern Territory's Crocodylus porosus populations, as a result of a compromise worked out at the Caracas meeting, were moved to CITES Appendix II at the Argentina CITES meeting this summer. Venezuelan Caiman crocodilus crocodilus skins from legal hunting started entering the international marketplace, although several Venezuelans, including CSG member Tomas Blohm, raised serious questions concerning the management techniques. The hunt has now been closed for 1986. See the section on Venezuela for details.

The next CSG meeting is planned for Quito, Ecuador, October 12-19, 1986. The sponsors are the Catholic University and Fundacion Natura. Current plans are that the meeting itself will take place at the university with registration on October 12 and the first sessions beginning October 13. A field trip on the Napo River on Fundacion Natura's Flotel will be from October 16-19. An additional field trip to the Galapagos Islands may be offered. The arrangements are being made with the assistance of CSG member, Eduardo Asanza. You will receive additional information on the upcoming meeting from the CSG Chairman.

At the 1984 IUCN meeting in Madrid, IUCN announced a list of 24 of the world's most endangered animals. Crocodylus intermedius was included among the top 12 species and Alligator sinensis among the 12 runners up.

The photo on the next page illustrates the major upheaval in your editors' lives -- the addition of a new assistant to the editors. Peter John Youyi Brazaitis IV was born, appropriately, on Father's Day, June 16, 1985, TL = 18.5 inches, wt. = 6 lbs. 2.5 oz.

Americans are supposed to disdain the metric system.) Before he was two weeks old he witnessed hatching of Crocodylus rhombifer. He has, at his current age of six months, assisted in inspections of several wallets and purses for the U.S. Fish and Wildlife Service, and at this moment is functioning as right-hand man to the editor.

Our excuses for the delay in publication of this issue are due to our wait for the arrival of the new assistant to the editors, frequent computer malfunctions, academic pursuits, and lastly the fretful need of the sub-editor's father to chase Yacare caiman in the Pantanal of Brazil. We offer our apologies, and ask you to continue to write. Many of you have asked if the Newsletter was alive and well. Indeed it is.

As a final note, we now are equipped for modem communication. Any of you who have access to a modem and feel particularly wealthy, may call Peter at 212-220-5042 to make an appointment to send your reports directly to our computer.

AREA REPORTS

AFRICA

Harvest quotas were established by CITES for Crocodylus niloticus populations in a number of African countries that do not have management plans that are based on actual population surveys

Kenya:

R. D. Haller of Baobab Farm Ltd., wrote the following:

"Baobab Farm, during its three year survey of the Tana River, Kenya, and from observations of farm reared stock, reports that although the main breeding season of Crocodylus niloticus in the area is Dec./Jan., breeding has also occurred in June/July. Does anyone know of a similar breeding pattern elsewhere? Any contribution on known trigger mechanism leading to breeding would be welcome. Write to R. D. Haller, Box

90202, Mombasa, Kenya."

ASIA

China:

A Sino-Japanese Symposium on Amphibians and Reptiles was held in Guangzhou, China from August 25-September 5. Huang Chu-chien presented a paper entitled, "Nest excavation and hatching behaviors of American alligator and Chinese alligator."

An article in the July 31, 1985 edition of China Daily, published in Beijing, cited statistics given by Chen Bihui on the success of the Chinese Alligator Breeding Centre in Xuancheng, Anhui Province. This year, 600 eggs are incubating at the farm. According to the article, the current survival rate of captively hatched young is 70 percent. The article stated that the total population of captive Chinese alligators in China, as a result of captive breeding, has increased from about 500 animals to about 1,000.

India:

Lala Singh reported that the Crocodile Resaerch Centre in Hyderabad, to which he recently has been shifted, may be offering two one-month courses on crocodiles along with their three-month certificate course on wildlife. The gharials at Satkoshia Gorge Sanctuary have bred for the first time in 10 years. Lala is working on his gharial data obtained from the Chambal Sanctuary. He hopes to begin a study on temperature dependent sex ratios in Gavialis gangeticus and perhaps Crocodylus palustris. He has a few copies of the Katerniyaghat Symposium Proceedings (Indian Crocodiles - Conservation and Research). If you would like a copy contact him: Dr. L. A. K. Singh, Crocodile Research Centre, Post: Bahadurpura, Hyderabad 500 264, India.

The photograph is of Lala's son, Anshuman, and "friend." Lala, too, believes in starting them early.

Dr. Sudhakar Kar of the Saltwater Crocodile Research and Conservation Unit, Orissa, submitted the following report entitled, "Incubation Experiment on C. porosus Eggs":

"i. In the last nesting season (May-June '84) of C. porosus, 288 eggs collected from the forest blocks of Bhitarkanika Wildlife Sanctuary were kept for incubation in the Project Hatchery at Dangmal (258 eggs) simulating the natural conditions, but a clutch of 30 eggs were transported to Chandabali (35 km away from Dangmal) on June 4, 1984 to experiment on the effect of incubation temperture of the eggs on sexual differentiation. The eggs were kept in three incubators and the temperature was maintained at 32-33°C, 33-34°C and 34-35°C of Incubators 1, 2 and 3 respectively. After 76 days of incubation hatching began, at first in incubator 3, then in incubator 2 and lastly in incubator 1. A total of 16 young hatched including one white hatchling. Out of the remaining 14 eggs, in two eggs, embryos were found dead and the rest of the eggs were found to be infertile.

"The hatching success of eggs of incubator 2 is quite satisfactory. Eight hatchlings hatched out of 10 eggs - 80 percent. Hatching success of the eggs of incubator 3 is extremely poor (three hatchlings out of 12 eggs - 25 percent) but from incubator 1, five hatchlings hatched from eight eggs (62.5 percent).

"After post-hatching care, the hatchlings were transported to the Saltwater Crocodile Research and Conservation Unit, Dangmal, and released into three separate pools of the hatchling pool set. After three months attempts will be taken to sex the hatchling crocodiles and then the ratio of male as to female, and also the effect of incubation temperature on control of sex can be known.

"In the next egg laying season, it is proposed to transfer more than 50 percent of the eggs which will be utilized in the experiment.

"ii. At the Saltwater Crocodile Research and Conservation Centre unit, Dangmal, only 115 hatchlings hatched out of 258 eggs (44.5 percent). In each and every clutch of eggs more than 50 percent of the eggs were found to be rotten and are presumed to be infertile. Now all the hatchlings are doing well in the pools at the unit.

"iii. Release of crocodiles.

"Further, 100 young saltwater crocodiles (size 1.5 m and above) were released into the suitable creek systems of the Bhitarkanika Wildlife Sanctuary as part of the 'grow and release' programme. Until now, a total of 350 crocodiles were released into the wild and a few more will be released early next year.

"iv. Our Research Unit is now in proud possession of two white saltwater crocodiles (local name - Sankhua). The 1975 hatched one is now eight feet in length and the newcomer, hatched last August is only 35 cm in length."

D. Basu of the Gharial Rehabilitation Centre, Lucknow wrote that over 1000 gharials have now been restocked into the wild from the Gharial Rehabilitation Centres, that they have an average of 75 percent success in rearing hatchlings from wild collected eggs, and that the Kukrail Rearing Centre, where he works, recently sustained damage to their newly constructed breeding enclosure due to flooding. He reported that they have been able to stop stone quarrying in the Katerma Ghat Gharial Sanctuary of the Girwa River.

They also have stopped stone quarrying downstream of the Indo-Nepal border. They hope that the gharial will recolonize the areas in which quarrying had been taking place. He further stated, "Two major factors have caused the shrinkage of gharial habitat: 1) impounding of water due to an irrigation barrage at the downstream-most extremity which has drowned out basking sandspits below 3-5 m of water and 2) disturbance due to quarrying activity upstream. A proposal for rehabilitation of freshwater turtles in the Ganges and its tributaries is under consideration for funding and implementation by the government. If this should happen some new river-life reserves may be created reinforcing the gharial project."

Pakistan:

Ashiq Ahmad, who is a wildlife management specialist at the Pakistan Forest Institute, Peshawar, asked us to publish this report:

"A Preliminary Report on the Crocodiles of Pakistan"

"Crocodiles are an important component of the aquatic ecosystem having considerable importance in the energetics and nutrient cycling in their environments. Also they possess great economic, recreational, educational and scientific values.

"Only a few decades ago crocodiles were plentiful in many parts of Pakistan but their number declined as many were killed for their hides and because of they preyed upon fish and possibly preyed upon domestic cattle. Many crocodiles lost their habitats through land development. These and other detrimental practices continued until most of the crocodiles vanished from the country resulting in sparse scattered populations and a few stray animals.

"In the 1970s, the Federal Government of Pakistan as well as some provincial governments realized the situation and sought to protect the crocodile populations by legislation. Special wildlife areas were created and several projects were prepared for the conservation, rehabilitation and captive farming of crocodiles. These projects are being considered for implementation.

"Although local reports were available on the occurrence of crocodiles in Pakistan, scientific surveys had never been carried out to determine distribution and status of these vanishing animals. In 1982 and subsequent years the Wildlife Management Branch of the Pakistan Forest Institute conducted some preliminary surveys on crocodiles in the Provinces of Sind and Baluchistan with the help of local staff. Results of the surveys are presented below:

"Sind:

"The province of Sind is famous for its network of rivers, canals, lakes, ponds and marshes, which harbour, year round, a variety of bird and animal life including crocodiles. Although published information is not available, two species of crocodiles occur in Sind, marsh crocodiles (Crocodylus palustris) and gharial (Gavialis gangeticus). In order to determine their distribution in various localities, questionnaires were prepared and distributed to officials of Game and Irrigation Departments, local fishermen, knowledgeable villagers, boatmen, waterfowl hunters and livestock owners around major wetlands throughout the province. It was followed by a

survey of localities where crocodiles were reported by respondents to the above questionnaires.

"Although some areas were inaccessible, most areas could be surveyed and the presence or absence of crocodiles could be confirmed either directly or through indirect means. Crocodiles were looked for on their daytime basking sites, and observed at night with the help of search lights.

"Marsh Crocodile (Crocodylus palustris):

"On the questionnaires it was reported that marsh crocodiles occurred in many places in Sind. Since main populations were reported from Nara Canal, adjoining lagoons or Dhands and lakes in the districts of Khairpur, Nawabshah and Sanghar, preliminary surveys were confined to those areas.

"Nara Canal originates from the River Indus near Sukkur and passes almost through the center of Sind. All along its course, it gives rise to many wetlands in the adjoining areas through seepage and floods. With the passage of time, Nara Canal and other adjoining bodies of water have evolved into quite productive aquatic ecosystems supporting outstanding numbers of wildlife species representing major mammalian, avian, reptilian and other animal groups.

"During 10 days of observation in February, 1983, 13 marsh crocodiles were sighted in District Khairpur, nine in Nawabshah and 13 in District Sanghar in Nara Canal, adjoining lagoons and surrounding Dhands, while the total population was estimated to be more than 120 in the above localities.

"Fortunately, crocodiles are now better protected in Sind than they were in the previous two decades. Successful attempts have been made to introduce them into new habitats such as Haleji Lake, situated on the Karachi-Thatta Road. Moreover, efforts are underway to initiate crocodile farming in Sind. Such attempts, if coupled with improved public awareness, would hopefully help the marsh crocodiles in Sind attain their previous status soon.

"Gharial (Gavialis gangeticus):

"Like the marsh crocodile, no information is available on the past population status of gharials in Sind. It is, however, known that lower parts of the River Indus had quite a few gharials about 25 years ago, two of which, caught from the same zone, are still present in the Zoological Gardens, Karachi. Present surveys, however, revealed that few gharials, if any, might have been left here and there, while main populations are now extinct from their previous habitats in Sind.

"Baluchistan:

"As it is arid, having less than 200 mm mean annual rainfall on most of its land areas, there are few wetlands in Baluchistan, but qualitywise these are comparable to any good wetland in the country. Most of the wetlands support thousands of waterfowl while some have abundant fish populations. Unfortunately, long distances, poor communications and hard conditions have kept many facts hidden about the wildlife resources of Baluchistan.

"Marsh Crocodile:

"Crocodiles have never been searched for in Baluchistan. In 1981 the author received an indiciation of the presence of crocodiles in a wetland near Uthal, a town in District Lasbela. Seven crocodiles were found there during investigations in February, 1982.

"After this encouraging discovery efforts were made to collect information about other wetlands of the province through the Wildlife Department of Baluchistan and personal contacts. These proved quite successsful and led the author to find crocodiles in several other places.

"Following a report that a crocodile was killed by a college teacher on a wetland called 'Nari Nadi' in the Civil District of Sibi, a survey was carried out during January, 1985 in the above wetland.

"Nari Nadi is a perennial stream which is about 160 km long and runs, for the most part, in the mountain range before it emerges in the plains near Sibi. Fish were plentiful in it at the time of the survey but water birds, although seen, were not many.

"According to local reports, crocodiles appear frequently in the 'plain zone' of the Nari Nadi during floods. Local villagers, being ignorant of their importance, kill many of the crocodiles. During the past three years, 10 crocodiles are reported to have been killed in this way. But in spite of such indiscriminate practices, crocodiles are still present and could be seen easily. On 23rd January, 1985, three crocodiles were sighted in an about 200 m^2 area while 10 more were estimated in a 15 km stretch of the Nari Nadi.

"Although a major part of the Nari Nadi could not be surveyed within the available time due to the long distances involved, lack of paths and difficult terrian, breeding populations were apparently present somewhere in its hidden and inaccessible zones and crocodiles which occur near Sibi Town seem to be the dispersed specimens only. This may be revealed by further investigations.

"After this, the search was continued in other parts of Baluchistan and in February, 1985, more than 50 were estimated in the River Hub, District Lasbela. Hub River is about 150 km long and ends in the recently constructed Hub Dam. Crocodiles were normally found in those segments of the river where water was still, deep, away from habitations. Only two such sites, Hanidan and Aripir, both having less than 15,000 m^2 in area, had eight and six crocodiles, respectively.

"Surveys were then extended to Makran, the southern and coastal division of Baluchistan.

"There are three rivers in Makran: Mihang Kaur, Kech Kaur and Shadi Kaur. As all are rainfed, the quantity of water in these rivers varies in different years and in different seasons of the year. Since the areas are far from and poorly connected with main towns, these wetlands have hardly ever been searched for crocodiles in the past. During the February, 1985 survey, many depressions were observed all along the courses of the Nihang Kaur, Kech Kaur and the combined river, Darya-e-Dasht which gets filled with water during floods. Locally, such depressions, where water is still and deep are known as Guarams and it was only in a few of such Guarams that 11 crocodiles were

spotted in two days. This suggests that there could be many more crocodiles in the entire stretches of the above rivers. Information from several local knowledgeable inhabitants supports this. The exact situation, however, has yet to be studied. Another river, the Shadi Kaur, is situated in the extreme south of Makram Division. Although some reliable reports indicated the presence of a few crocodiles in three Guarams on Shadi Kaur, the information has yet to be confirmed and the exact population determined.

"Gharial:

"Gharials are neither reported from any part of Baluchistan nor could they be observed during the present surveys.

"Punjab:

"Some of the rivers in Punjab used to harbor crocodiles about half a century ago but there is no published record. Presently, it is generally believed that no crocodile survives in the wild in the wetlands of Punjab. This needs to be ascertained through proper investigations. Rehabilitation and crocodile farming programs are, however, underway which are expected to yield fruitful results.

"N.W.F.P. Azad Kashmir and Northern Areas:

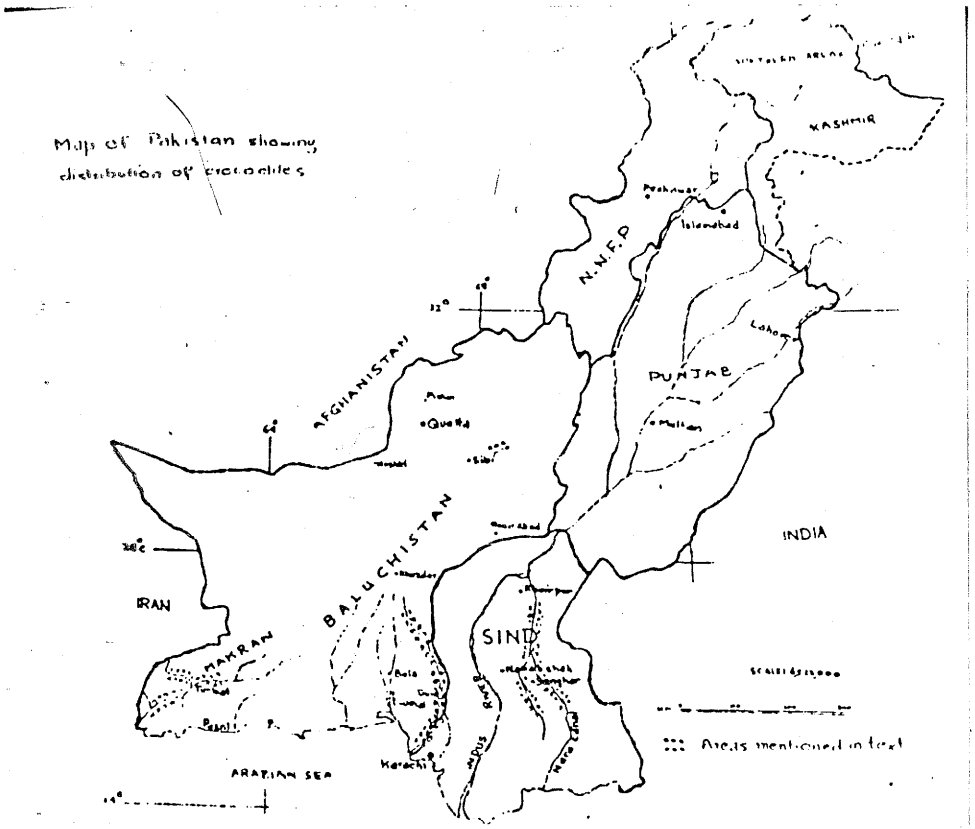
"These are the only areas where crocodiles have niehter been reported in the past, nor are available anywhere now. Moreover, wildlife departments of these areas presently have no program for the introduction of farming of crocodiles in their wetlands.

"Conclusion:

"It is evident from the above that crocodiles are still present in several localities in Pakistan and, in some of them, exist in fair numbers. Since great potential exists to increase the present population to exploitable levels, serious efforts need to be initiated on national and provincial levels. Present surveys, although preliminary in nature, have revealed many crocodile sites, and other sites may exist. A detailed investigation is therefore required not only to determine distribution and exact population, but also to find out the existing and future threats to the survival of crocodiles throughout their natural habitats in the country, especially in Sind and Baluchistan. The task of supplementing the wild population through rehabilitation programs could then be initiated more successfully. Similarly, the scope of crocodile farming as a cottage industry needs to be evaluated beforehand and, if feasible, should be undertaken without further delay.

"Although several problems are expected to be identified when the problems of crocodiles are studied in detail, the obvious one is lack of public awareness about their importance throughout the zone of their occurrence. Many means and ways are available to reach the common man, but perhaps it would be a better approach if an education unit were to accompany the survey team and a conservation message is passed on simultaneously to local communities around crocodile habitats."

(See map on next page.)



Thailand:

Samutprakan Crocodile Farm and Zoo is exhibiting a 28 year old, five meter long Crocodylus porosus x Crocodylus siamensis, according to an article in the June 17, 1985 edition of the Bangkok Post.

Charoon Youngprapakorn, manager of the Samutprakan Farm, reported to us that the farm has more than 10 albino crocodiles, none of which was purchased (see "Errata").

AUSTRALIA

The Australian Council of Nature Conservation Ministers presented "A Technical Conference on Crocodile Conservation and Management." Goff Letts, who recently retired from the Conservation Commission, supplied us with the following report:

"One hundred delegates from 11 countries attend a very successful technical conference on crocodile conservation and management held in Darwin from 13 to 18 January, 1985.

"This meeting was held under the aegis of the Australian Council of Conservation Ministers, with the local organization in the hands of the Conservation Commission (Northern Territory). Conference Chairman was Dr. Grahame Webb, and the official opening was carried out by the Hon. Steve Hatton, N.T. Minister for Conservation.

"Crocodile researchers and managers throughout the world will look forward with great interest to the publication of the proceedings, which should prove a valuable handbook for all who are interested in the conservation of crocodilians.

"Over 50 papers of consistently high standard were presented under the broad subject headings of:

World Crocodile Management	(day 1)
Australian Crocodile Managemnt	(day 2)
Crocodile Farming and Ranching	(day 3)
The Mechanics of Crocodile Management	(day 4)
Reproduction, Embryology and Egg Incubation	(day 5)

"Field excursions included nightly spotlighting on the Adelaide River, an afternoon session at Crocodile Farms (N.T.), nest inspection and egg collection at Melacca Swamp, and helicopter flights to Finniss River nest sites and Hilton Graham's Letaba farm.

"Seven Aboriginal delegates were present from Queensland and the Northern Territory, and it was generally considered that the session on 'Aboriginal Attitudes' was one of the highlights.

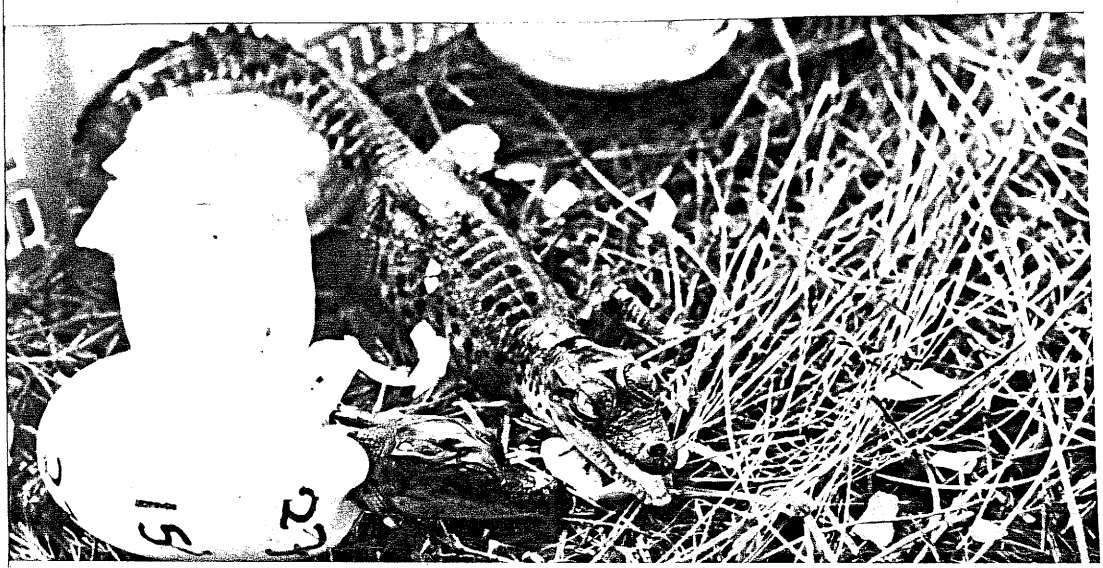
"Other participants were drawn from India, Israel, Papua New Guinea, South Africa, Thailand, United Kingdom, United States, Venezuela, Zambia and Zimbabwe. Five Australian states and the Commonwealth Government were represented, together with several universities and non-government conservation groups.

"The organizers expressed particular thanks to those who had travelled from overseas, and to all who had contributed through papers and discussions. Undoubtedly, the success of this meeting, scientifically and socially, forged another strong link in the worldwide chain which now brings crocodile people together in a unique way."

Volume 18 of Harry Messel et al.'s monograph, Surveys of Tidal Waterways in Northern Australia, was published last fall. His resurveys of the Adelaide River in July, 1984, produced results he classified as "exciting."

Gordon Grigg, working with Russell Baudinette, Bill Runciman and Bren Gannon, at Flinders Medical Centre in South Australia, has obtained "some superb angiographs of blood flow through the heart of Crocodylus johnstoni. They are trying to determine the function of the foramen of Panizza.

Guy Ben-Moshe of Hammat Gader Alligator Park in Israel, has been travelling around the world photographing crocodilians in their local habitats. While in Australia, he reported to us on the delisting of the Northern Territory's C. porosus populations from CITES Appendix I to CITES Appendix II. "I think that to the Conservation Commission, it's an anti-climax, and the commercial rearers don't know what comes next ..." Guy sent us the photo, taken at Nerrimah Crocodile Farm, 35 km south of Darwin, of C. porosus hatchlings. (See next page.)



CENTRAL AMERICA

Costa Rica:

Earl Junier Wade of the Ministerio de Agricultura y Ganadaria reported that he is still working on their Experimental Farm Project. They have 6 adult Caiman crocodilus fuscus (2 males and 4 females) and 90 yearlings. The adults are maintained in a 60 x 40 m pen that has two 10 x 25 m ponds, "each shaded with banana, jute and papaya trees." Earl has seen a few Crocodylus acutus on the Atlantic coast, but he reports that they are most common on the Pacific coast.

Honduras:

CSG chairman, Dr. F. Wayne King, recently returned from a trip to Honduras, where he is consulting on the possibility of establishing a crocodilian farm.

MIDDLE EAST

Egypt:

An article in the December 16, 1984 issue of the Arizona Republic, based on an article that appeared in the Egyptian weekly, **Ocotober**, reported that the Egyptian government has prohibited capture and sale of Crocodylus niloticus. Increased trade in skin and meat was blamed for bringing the animals to the brink of extinction. Nature reserves will be established around the Nasser Reservoir, which was reported to have had a recent increase in the crocodile population. The article further stated that, "Many of the 200 victims of the sinking of a ferry in the reservoir last year were killed by crocodiles."

Our roving reporter, Hammat Gader's Guy Ben-Moshe, gave us the unofficial view of the croc situation in Egypt:

"... I've seen a lot of crocodile products for sale, especially heads, belts, bags and stuffed animals. The stuffed animals are 60 cm to one meter long, probably one and two year olds. All of the dealers say that the crocs are from Sudan, which is probably true. The last croc sighted in Egypt was in the Nile in 1876 (Royal Natural History, 1896 edition). Prices average 15 £e (Egyptian Pounds) a head, 12 £e a belt and 25 £e a stuffed animal, but what you actually pay depends on your haggling stamina and where you get your pounds from -- the bank or the black market."

Guy reported that the Cairo Museum has two 3000 year old mummified crocodiles on exhibit, both five meters long "and in unbelievably good condition."

Continuing with information on ancient Egypt, the November 24, 1984 issue of Science News reported that Joseph Sassani of the Hershey Medical Center, Pennsylvania State University, has found references in historical texts to the Egyptians using eye salves made of Nile River mud and crocodile dung. [Ed. note: There may be more profits to croc farming than we think!]

Israel:

Guy Ben-Moshe of Hammat Gader sent us the following report on the '83-'84 breeding season:

"Last winter was a drought year in Israel, spelling bad news for our '83-'84 breeding season. December through February was dry and warm, and our gators remained active throughout our winterless winter. Then, March and April saw a cold spell and rainfall just when mating activity should start. Instead of starting to bellow and caress, etc., the herd went dormant! When May came around spring arrived finally but the season was upset. There was very little copulation, and only 350 eggs in June (compared to 600 the previous year). Apparently the weather also disturbed their biological timetable, throwing off schedules for ovulation and spermatogenesis because only 40 percent of the eggs were fertile. Many females that built nests didn't lay until mid-July, and although their eggs were fertile, the hatchout rate was weak compared to June egg deposits. Total hatchout for summer '84 was 82 hatchlings, with 75 now thriving.

"An interesting plant-animal relationship was observed also this year. On our fruit rearing trees in the park (papaya, lemon, careb, dates, grapes, olives and numerous berries), the fruit appeared very late, in small quantities, and most fruit failed to ripen but rather rotted on the trees. This was in direct harmony with the outcome of our gator harvest!

"In July '84, Prof. Mark Ferguson was our guest for 10 days. We set up a mini-lab at Hammat Gader for dissection and experimenting."

Guy further reported that Prof. Amos Ar of Tel Aviv University is studying respiration of alligator eggs in incubation. Guy brings him 10 percent of Hammat Gader's alligator eggs for study.

From our sources of information, it appears that Hammat Gader is planning to greatly decrease or completely abandon alligator rearing operations. They applied to the U.S. Fish and Wildlife Service for a permit to export 400 alligators to Joel Smith in Florida, their original source for the alligators. According to an article in The New York Times, December 19, 1984, Hammat Gader started with 120 alligators, and, at the date of the article, was home to nearly 400.

According to a caption on a photo in The Jerusalem Post, November 25, 1984, kibbutz Gan Shmuel purchased 220 Crocodylus niloticus from Zimbabwe. The kibbutz has begun a crocodile farm for hide production. Anyone who chatted with Shlomi Ranot of CLAL Crocodile Farms Ltd. at last year's CSG Meeting was told of CLAL's plans to open crocodile farms in Kenya, Greece and other parts of Israel and to establish a tanning cooperative. We have not, as yet, heard of their progress other than the above-mentioned article about Gan Shmuel. Your editors received an informative, if somewhat irreverent, poster from CLAL advertising their crocodile farming operation.

NORTH AMERICA

United States:

Mark O. Bara, of the South Carolina Wildlife and Marine Resources Department reported that he answers "a lot of telephone calls on nuisance alligators" and occasionally moves nuisance animals.

The State of Texas management plan for the American alligator was approved and published in October, 1984. It provides for controlled harvesting of the animals.

The September/October 1984 issue of the Louisiana Conservationist printed recipes for Italian fried alligator, microwaved alligator, alligator dip, smothered alligator and alligator meatballs. We thought smothered alligator would be real easy: first you take a heavy plastic bag ...

Dominique's, an elegant French restaurant in Washington, D.C., is selling an appetizer of scallopini of alligator in butter with mustard sauce for $6.75. (Eds. note: No, we haven't tried it. We're not sure we could eat our "friends.") Also, the Tamashiro Market in Honolulu, Hawaii was advertising alligator meat for sale in the October 10, 1984 issue of the Honolulu Star-Bulletin. (Eds. note: Anyone for alligator tempura?)

The October, 1984 issues of newspapers from Gainesville, Florida were full of stories about the experimental alligator hunt in Alachua County. Supervised by Tommy Hines and staff of the Game and Fresh Water Fish Commission, the hunt yielded 272 alligators from three lakes in Alachua.

The September 29, 1985 edition of the Fort Myers (Florida) News-Press covered the

experimental alligator hunt at one of the local lakes in southern Florida. According to the article, the hunt, which previously encompassed only three lakes in the Gainesville vicinity, now includes a total of nine lakes throughout Florida. Total take of alligators is expected to be about 1000 animals. Dennis David of the Florida Game and Fresh Water Fish Commission estimated that there are one million wild alligators in Florida, but that population levels have been more or less stable for the past five years. Aside from the 1000 animals taken during the legal hunt, an additional 2000 "nuisance" alligators are killed by licensed hunters in Florida each year. Not only are hides sold (for as much as $25 per foot), but meat is sold in five pound packages for about $5 per pound. The proceeds from the sale of hides are split 70:30 between the hunters and the state game commission. The hunters make 100 percent profit on the sale of meat. An additional article in the same issue dealt with alligator bites. Although relatively uncommon, about five bites per year are reported in Florida. This year, one man was killed in West Palm Beach from alligator-inflicted injuries. Since 1975, Florida has had 52 non-fatal alligator attacks on humans.

There was an article in the January 3, 1985 New York Times on alligator farming in Florida. It stated that 25,000 alligators were "sold commercially in the United States each year..." Approximately 4000 of these animals were farm-raised in Louisiana and Florida. Chris Plott, of the Plott Hide and Fur Company, one of the few U.S. tanneries to process alligator skin, was quoted as saying that demand is growing for alligator products. They are priced at approximately $100 for a belt, $600-1200 for boots, and $500-2000 for ladies' handbags. (See our marketing section for the latest assessment of the U.S. market.)

Dennis David of the Florida Game and Fresh Water Fish Commission reported to us that he is state coordinator for the experimental alligator harvest. He is studying geographical variation in habitat types and quality related to density of alligator populations, alligator survival and growth rates, and nest success and hatching survival in the Everglades.

In the last issue of the newsletter, R. Howard Hunt of the Atlanta Zoological Park reported on the circumstances surrounding the death of a young boy in Port St. Lucie, Florida. Last fall, George Campbell of the Southwest Florida Regional Alligator Association visited the park where the tragedy occurred. He reported that River Gate Park had just been built and had been opened in June, 1984. It was the site of work of pile drivers and bulldozers, and docks were in the process of being built. The canal where the accident took place is man-made, with a bank high enough to allow alligators to nest on it. George felt that the alligator that killed the boy was probably stressed and hungry due to all of the construction activity disrupting his usual sources of food. George believes that this was an accident that could have been avoided if anyone had checked to see if any large alligators were living in the area. As a postscript, George added that when he spoke with a realtor in Port St. Lucie and asked about the incident, he was told that it wasn't true. Real estate in Florida is too valuable to allow such bad publicity to scare away potential buyers.

OCEANIA

Papua New Guinea:

Martin Hollands provided us with the following report:

"(1) Crocodylus novaeguineae nest surveys. We were so delayed due to mechanical problems in the field that only about 75 percent of the survey sites were covered. Unfortunately, the results from these sites showed there was a large reduction in nest numbers in all habitats and our nesting index for freshies, which had risen from 100 in 1981 to 138 by 1983, dropped down to 98. There were no known factors which could have caused such a substantial drop in the breeding population, which leads to the inescapable conclusion that there is a vast fluctuation in the percentage of potential breeders that do nest each year. As yet we have no idea as to the controlling factors, so we cannot correct for them in our data interpretation. I would, of course, have written my paper for the Caracas meeting rather differently if I had had these survey results available a month earlier!

"(2) Spotting tagging program. We are making good progress with the program on the Bensback river system in the southwest of the country, which is more suitable than most of PNG, with a relatively discrete river without vast swamps on either side. One interesting fact that has already come out of this is that on this river, where nesting is restricted to the banks (as there aren't any of our famous floating mats there) significant recruitment has only occurred in one out of the last three years. As we normally see 40-50 crocs in a night on the Bensbach -- excellent counts for here-we always thought there was a good population there; however, the tagging program has shown we are seeing a high percentage of the crocs present, as opposed to the normal less than one percent.

"The work in the Sepik is hindered by the difficulty of catching croc there. A couple of weeks ago we tried catching on a discrete roundwater which supports about 30 nests a year. We saw three crocs of which we managed to catch one! As you can imagine, it takes a while to get a good population of marked animals.

"(3) Crocodylus porosus nest surveys. We have just finished the annual salty nest surveys in the Sepik, which went excellently. All areas and habitats showed a large increase in nest numbers, and to rectify an inbalance in the survey sites we included some extra 'scroll" areas and found a previously unknown site, close to our Ambunti base which was absolutely riddled with them.

"Although the freshie fluctuations show that caution is needed in interpreting nesting trends, I am obviously happied that our index is going
1982 - 100; 1983 - 101; 1984 - 123; 1985 - 162; than the other way around.

"(4) Experimental egg harvest. As part of the salty surveys in the Sepik in March, it was decided to try an experimental egg harvest to allow an assessment of its potential in PNG. Nests were selected that were in a position liable to flooding or in an area where a high percentage of nests are normally taken for human consumption.

"A total of 671 viable eggs are being incubated at Mainland farm from 14 nests, less than 20 percent of the survey totals.

"Land owners were paid for the eggs, which seems to be an acceptable alternative to their eating the eggs, and a per egg contribution was also made towards the costs of the monitoring surveys.

"Both Mainland and Ilimo farms have had excellent success with their breeding programs when you consider the young age of their stock, and both intend expanding their captive breeding. Mainland has put in a very impressive breeding and incubation facility."

Martin reported to us in July that 99 percent of the viable eggs in the experimental egg harvest hatched. Paying people in the Sepik for eggs has worked out very well. "Normally," Martin reported, "35 percent of salty eggs are eaten in the Sepik. This year only two raided nests were seen."

SOUTH AMERICA

Brazil:

Pete Brazaitis spent three weeks in the Pantanal in collaboration with IBDF (Instituto Brasileiro de Desenvolvimento Florestal) and EMBRAPA (the research branch of the department of agriculture) in November, under funding from WWF-U.S. and the N.Y. Zoological Society. While the focus of the trip was to collect field data and skin samples of Caiman c. yacare for chemical analysis, the trip provided the opportunity to gain an overview of the present situation concerning the caiman. Both organizations are setting up research programs involving husbandry, captive management, assessment of wild populations, reproductive biology and management. Although there are several experimental rearing centers including an EMBRAPA farm in Mato Grosso du Sul and a reseach center in Corumba, they have also contracted with Roberto Stole, owner of Fazenda Sao Vicente, to set up a commercial experimental farm. IBDF has a reseach center at Pocone. All operations are still in their infancy and they are far from producing captive reared skins. The EMBRAPA program is run by Francisco Breyer, and is very impressive and well on its way. Renato Cintra of IBDF directs the center at Pocone, which so far has concentrated on the biology of the wild population. The IBDF caiman management program is being put together under Jordan Wallauer. This editor was much impressed by the high caliber of the biologists and staffs at IBDF and EMBRAPA, their enthusiasm and the farsighted concern they had for the future of Brazilian caiman. Poaching continues to be a serious problem in the Pantanal. Brazilian wildlife law enforcement officers are to be commended for their continuing efforts and diligence, often in the face of better equipped, highly funded and well organized poaching operations. While I was in Brazil, French and Italian leather industry representatives were soliciting contacts for Brazilian skins, anticipating the opening up of a wild caiman harvest in 1986. Although Brazil does not permit the commercial hunting of wildlife, there is great pressure to allow a commercial hunt for the immediate economic benefits to be gained. Hopefully, hunting will not be permitted before a management program is formulated and IBDF and EMBRAPA biologists have had time to complete their research. 1986 appears to be a very premature target date.

The caiman populations in the Pantanal should be carefully watched. According to government biologists, local landowners and farmers, and my own very cursory observations, the populations are barely stable if not declining, animals most frequently encountered are small (mostly less than 2 m) and smaller than previous years,

females are taken by poachers very easily while they are protecting young during the dry season, and only about 40% of the nests escape flooding or predation. New road construction will make more of the Pantanal accessible during most of the year.

This writer most enjoyed his stay in the region, due largely to the good cheer, friendship and common concerns shared with the fine people I had the good fortune to work with - Carlos Yamashita, Renato Cintra, Francisco Breyer and Jordan Wallauer. Carlos and Renato shared what they described as an "orthopedic" road bed with me when we lost our way one night and decided to sleep where we were. As it was, we were about a hundred meters from the truck and our hammocks. They sure know how to show North Americans a good time down there!

Venezuela:

From Stephan Gorzula: The government of Venezuela re-assessed the commercial caiman hunting program it initiated last year and decided to suspend all commercial hunting for one year. Other sources inform us that the reason for the suspension was abuse and mismanagement in issuing hunting tags. Many more tags were issued by government officials than were authorized under the quotas which were set. In addition, more animals were taken to make up for skins that spoiled due to improper preservation. Carlos Rivero Blanco and Tomas Blohm, along with other Venezuelan biologists, expressed great concern that the harvest quotas were not being enforced.

TRADE

The strong U.S. dollar in 1985 continues to mean that many importers brought in European and Asian made crocodilian products for sale in U.S. markets rather than the market utilizing products made in the U.S. The U.S. crocodilian product manufacturing capability continues to decline according to industry sources. Several shifts in the trade were more and more evident as the year went on. First, no longer do we see low or moderate priced caiman products. Caiman largely replaced crocodile on high quality handbags and ladies' and men's shoes which are sold in quality stores and boutiques. Many are sold simply as alligator. Yet, caiman products commanded the same prices to the unknowing consumer as classic crocodile. Wallets and billfolds sell for about U.S. $60 to $180, men's loafer shoes between $475 and $600 (Salvatore Ferragamo, 5th Ave., $595) handbags from $375 to over $1000. For the 1985 Christmas season Manolo Blahnik showed a caiman handbag shaped like a binocular case for $1600. Asprey Shop in New York advertised umbrellas with caiman covered handles as crocodile for $260.

Second, artificial crocodilian products began to arrive in great numbers from Italy. Some products were listed as containing crocodile (ground up fragments) in plastic or leather composites. Most products were offered as prints or embossed leather and were made to sell in the moderate to high price range in quality shops. The reproduction quality has improved greatly over the past few years. Bloomingdale's advertised a crocodile embossed clutch by Fendi for $265 while Altman's displayed a black evening bag in embossed crocodile leather for $150. It appears that as the genuine skin goes up in price or becomes limited in quantity through management controls, part of the industry is turning to developing the technology in artificial products. Most of the genuine skin, which is of caiman, appears to be Caiman crocodilus, largely C. c. yacare. Brazilian authorities cite the French, Italian, U.S. &

West German market demands as the bases for the extensive poaching in the Pantanal.

ZOOS

MIKE DAVENPORT'S COLUMN

Crocodilian Hatching in U.S. Zoos:

The following are crocodilian hatchings which occurred in U.S. zoological parks between 1 September, 1984 and 30 June, 1985. This information was gathered by canvassing these institutions by telephone. Numbers in parentheses indicate hatchlings that did not survive.

Species	Number Hatched
Alligator mississippiensis	
Busch Gardens, Tampa, Florida	32 (1)
Greater Baton Rouge Zoo, Baton Rouge, Louisiana	4 (2)
Caiman crocodilus yacare	
Philadelphia Zoological Park, Philadelphia, Pennsylvania	2
Paleosuchus palpebrosus	
Rio Grande Zoological Park, Albuquerque, New Mexico	7
Crocodylus cataphractus	
Metrozoo, Miama, Florida	7
Crocodylus moreleti	
Atlanta Zoological Park, Atlanta, Georgia	app. 30 (app. 15)
Crocodylus niloticus	
Busch Gardens, Tampa, Florida	58
Crocodylus rhombifer	
New York Zoological Park, Bronx, New York	15
Osteolaemus tetraspis	
Memphis Zoological Garden and Aquarium, Memphis, Tennessee	2
Tomistoma schlegeli	
New York Zoological Park, Bronx, New York	9 (2)

Breeding programs at some zoos have been curtailed because problems were encountered in disposing of young. Zoos could be sources of fertile eggs or hatchlings for reseachers. If anyone has research interests that call for eggs or hatchlings, or any comments on this matter, please contact me.

Michael Davenport, Collection Manager
Dept. of Herpetology, National Zoological Park
Washington, D.C. 20008, USA

REPORTS FROM OTHER ZOOS

Chris de Beer of the National Zoological Gardens of South Africa, Pretoria, wrote that they presently are incubating 200 eggs of Crocodylus niloticus for an experiment on sex determination and temperature. The experiment is a collaborative effort of the zoo, the Natal Parks Board and the University of Pretoria.

We have more information on the hatching of Paleosuchus palpebrosus at the Rio Grande Zoological Park. The female had laid 16 eggs on September 17. Only nine of these eggs were fertile. The seven animals hatched between 21 December, 1984 and 5 January, 1985 from 13 eggs that were artificially incubated. The eggs were maintained in a 1:1 combination of vermiculite:water at temperatures between 87-91° F in a covered box within an isolet. They were misted with water whenever the vermiculite felt too dry. At hatching, the young were an average length of 22.1 cm and an average weight of 40.2 g.

Twenty-two eggs were laid by a Crocodylus rhombifer at a private aquarium/terrarium in Stockholm, Sweden in 1984. Eighteen of the eggs hatched.

The following appeared in a Brazilian newspaper and was sent to us, with a translation, by George Campbell. Neither newspaper nor translator were identified.

"AUGSBURG, West Germany -- The caprices of love vary greatly according to the caprices of nature. For example, the crocodiles have a mania for making love only during rains and thunderstorms. In a small thunderstorm, whatever it is doing, the animal becomes excited, but if there is not a big storm, nothing happens. This is the breeding problem faced by a local zoo. However, everything was solved with the sound of the elements on a recording. Since they discovered that (the animals) enjoyed the noise, they dispensed with the meteorological substitute for a concert of Wagner combined with the percussion of rock music. Many little crocodiles were born."

ANNOUNCEMENTS

The Crocodile Project in Papua New Guinea announced they would be filling the following two positions:

1. SENIOR ECOLOGIST, Crocodile Management Project.

Required to head a small team of reserachers primarily investigating effects of cropping on the wild populations of C. porosus and C. novaeguineae in Papua New Guinea. Other research on aspects of crocodile biology relevant to management and farming would be included. There would be the possibility of extending operations into monitoring other exploited species. There would be an operational budget of approximately US$60,000 (excluding salaries).

(This position was supposed to have started in October or November, 1985. We have not heard whether it has been filled.)

2. Officer - in - Charge of Crocodile Farm Development

To provide technical advice to established crocodile farms/ranches and to provide the technical assistance required for new farms to be established, particularly in association with fishing and livestock operations. With a small staff of national officers and overseas volunteers a network of smaller operations would be developed to supply the final rearing operations. This position would start in early 1986, though an earlier start could be arranged on a consultancy basis.

Both positions would be at the Scientific Officer Class 4 level, which has a salary currently equivalent to US $21,000 (plus a 24 % gratuity p.a., taxed at 2 %), together with free housing, leave fares and other benefits. Contracts would be for an initial period of three years.

For additional information contact: Crocodile Management Project, Dept. of Primary Industry, P.O. Box 2141, Boroko, NCD, Papua New Guinea.

REQUESTS

The International Living Fossil Society, 3021-C "Q" St., North Highlands, California 95660, USA, is soliciting memberships (US$25.00/yr.), articles for their newsletter, and information on and assistance with breeding Paleosuchus palpebrosus. Contact Phillip Langdon at the above address for further information.

Juergen Fiedler-Buerk would like information on sex ratios of randomly shot adults and farm-reared juvenile crocodiles. He would also like Goran Blomberg's current address. (We don't have it.) He may be contacted c/o Prof. J. D. Skinner, Dept. Zoology, University of Pretoria, Pretoria, South Africa or at Sektion Herpetologie, Senckenberg-Museum und Forschungsinstitut, Senckenberganlage 25, D-6000 Frankfurt/M., F. R. Germany.

R. D. Haller of Baobab Farm Ltd. wrote, "J. D. Balarin, a research and development consultant with Baobab Farm, Kenya is preparing a review on integrated fish farming and crocodiles. Anyone who is involved in such operation or who seeks advice on fish farming is asked to write to him at Box 90202, Mombasa, Kenya." Mr. Haller requests information on crocodilians laying eggs out of season and known trigger mechanisms for breeding. Contact him at the address above.

Dr. Alvaro Javier Luna, Director General of the Buenos Aires Zoological Garden, Republica de la India 2900, Buenos Aires, Argentina, requests information on crocodilian breeding, radiotelemetry, biochemistry and physiology of crocodilian immobilization, and

other methodologies applicable to crocodilian research.

BOOK REVIEWS

The Crocodiles of Yamoussoukro, by V. S. Naipaul, in Finding the Center, Alfred A. Knopf, New York, 1984.

I wouldn't presume to review a work of literature, especially one by an author of the stature of V. S. Naipaul. The crocodiles in this piece, a narrative of the author's travels in the Ivory Coast, are the crocodiles maintained by President Houphouet-Boigny in his native "village," now the massive presidential palace. The animals are real enough, but they also are metaphors for aspects of African politics and culture. It is a pleasure to read something so well written about animals we tend to think of in statistical terms. MEW

NOTE: In 1984, a review appeared in these pages on an FAO Field Document by Elliott Jacobson on his visit to India. Dr. Jacobson took exception to our review, stating that he felt our review was unfair and inaccurate. He has requested we publish his lenghthy rebuttal. We do not have the space to publish his letter. We would be happy to provide a full copy of the letter to anyone who is interested.

BOOKS AND ARTICLES RECEIVED

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Gorzula, Stefan. 1984. Proposal for a photographic method for size estimates of crocodilians. Herpetol. Review 15: 38-39.

Huang Chu-chien. 1982. A rare and valuable animal, the Chinese alligator. Hong Kong Dagong Bao, May 23, 1982. (In Chinese.)

Huang Chu-chien. 1983. Measures to save the Chinese alligator. Natural History (Bowu) 18: 35-36. (In Chinese.)

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Rodda, Gordon H. 1984. Movements of juvenile American crocodiles in Gatun Lake, Panama. Herpetologica 40: 444-451.

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Sundar, V. Shyam. 1984. Mugger breeding results at Madras Crocodile Bank Trust 1984. Hamadryad 9: 25-26.

Thompson, Bruce C., Floyd E. Potter, Jr. and William C. Brownless. 1984. Management Plan for the American Alligator in Texas. Texas Parks and Wildlife Dept., Austin, Texas. 81 pp.

Whitaker, Zahida. 1985. Mugger haven. Anim. Kingd. 88: 37-39.

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PERSONALS

There are a number of new hatchlings other than our own. Grahame and Alison Webb became the parents of a baby boy, Ashley Giles, born March 12, 1985. Lala Singh's wife, Pushpa, gave birth to a girl on February 25, 1985.

D. Basu of the Gharial Rehabilitation Centre, Lucknow, India, has a nearly six year old daughter and "another kid perhaps on the way." Good luck.

Eduardo Asanza married Ana Cristina Sosa on March 23, 1985.

Jim Kushlan has moved to the Department of Biology, East Texas State University, Commerce, Texas 75428, USA.

C. L. (Ab) Abercrombie is now at Wofford College, Spartanburg, South Carolina 29301, USA.

Guy Ben-Moshe was interviewed for the Sunday Territorian (N.T., Australia). He denies responsibility for the direct quotations in the article. We're not sure he can deny responsiblity for the smiling face in the photos.

ERRATA

Don Ashley, of Ashley Associates, Tallahassee, Florida, USA, was concerned that we had quoted an article that had appeared in Entrepreneur Magazine which had purported to quote him about the future of the alligator and crocodile market. According to Don, the quotation was spurious. This misquote by Entrepreneur has caused him much embarassment.

In the last issue of the newsletter we erroneously reported that Charoon Youngprapakorn had purchased an albino Crocodylus porosus. Although Samutprakan Crocodile Farm has more than 10 albinos of this species, none were purchased. We apologize for the error.

Best wishes for 1986. Hope to see you in Quito!

Peter Brazaitis and Myrna Watanabe

Contact address:

c/o Herpetology Department
New York Zoological Park
Bronx, New York 10460
USA

TEARSHEET

Please return to:

Peter Brazaitis/Myrna Watanabe
Editors
Crocodile Specialists Group Newsletter
c/o Herpetology Department
Bronx Zoo
Bronx, New York 10460
U.S.A.

Name_____

Address_____

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