ZOOLOGY

Chairman: Les Hearson, Department of Biology, Wabash College, Crawfordsville, Indiana 47933

Charles E. Mays, Department of Biology, DePauw University, Greencastle, Indiana 46135, was elected Chairman for 1974

ABSTRACTS

An Analysis of the Nerve-mitotic Distribution in the Regenerating Forelimb of the Axolotl, *Ambystoma Mexicanum*. John E. Albrecht and Lester L. Hearson, Department of Biology, Wabash College, Crawfordsville, Indiana 47933.——An analysis was made of the distribution of nerve fibers, mitotic activity, and cell density. The data are discussed in the light of previous works concerning the roles of nerves, the apical cap, and the wound epithelium in the control of regeneration. A general lack of statistical significance in the results is suggested as a reflection of the interweaving effects had by each. Present findings indicate that in limb regeneration the roles of nerves and the wound epithelium are so interdependent that they preclude the examination of any single influence.

List of Mammals Known to Occur in Belize, Central America. Ralph D. Kirkpatrick and Anne M. Cartwright, Biology Department, Ball State University, Muncie, Indiana 47306.——A list of recent mammals known to occur in Belize was compiled by a search of the literature, by contacting persons who have collected in Belize, and by collecting during the summers of 1972 and 1973. A total of 87 species have been collected in this country. This total includes representatives of 11 orders and 29 families.

Blood Characteristics and Activity of some Neotropical Frogs. Duvall A. Jones, Department of Biology, Saint Joseph's College, Rensselaer, Indiana 47978.——Erythrocyte count, hematocrit, and hemoglobin concentrations were studied among a variety of frog species in Surinam, and considered in light of the frogs' habits and environment. Active tropical anurans tend to have high red blood cell (RBC) counts and hemoglobin concentrations, and they seem to frequent open habitats. Less active tropical frogs have low RBC counts, low blood hemoglobin concentrations, and seem to be restricted to the interior of well-developed forests. Although size and shape of erythrocytes vary from one species to another, hemoglobin content per RBC changes relatively little. Efficiency of oxygen transport by red blood cells may be a factor which regulates anuran activity and plays a part in habitat preference.

Maternal Behavior in Domestic and Wild Swine: An Ethological Approach. Charles Sinclair and Jack L. Albright, Department of Animal Sciences, Purdue University, West Lafayette, Indiana 47906.——Careful

observations of the behavior of domestic sows (*Sus scrofa domestica* and their litters were conducted at the Purdue Swine Research Farms and the Purdue Ethology Laboratory. Nursing behavior, teat order of littermates, and diurnal patterns of maternal and piglet activity were examined.

The nursing behavior could be initiated by either the sow or her litter and several stereotyped patterns were found to be effective in initiating nursing. Some of these patterns are also seen in wild swine. The frequency of nursing varies somewhat among litters and becomes less as the pigs grow older. There was no statistically significant difference between day and night with respect to either frequency of nursing or total time spent suckling. This is true for pigs in confinement and those on pasture. Social facilitation is an important factor in determining the timing of nursing.

Teat order is the first evidence of territorial behavior in the pig and is established during the first day of life. We found that both visual and olfactory cues are important in recognition of the "territory." A form of marking occurs. Wild swine establish teat orders. It appears that the more dominant pigs tend to take the pectoral teats. These are richer in milk flow.

Diversity, Stability and Temporal Organization of a Stream Caddisfly Community. VINCENT H. RESH, Department of Biology, Ball State University, Muncie, Indiana 47306.——Light trap collections from the Salt River Basin, Spencer and Anderson counties, Kentucky, from March to November 1971, contained more than 87,000 caddisfly adults, 20,000 of which were identified after sub-sampling. Quantitative collections made with a portable, ultraviolet light trap, beginning 20 minutes after sunset, were either of 1-hour duration or of three consecutive 20-minute periods. Other hourly samples were collected irregularly throughout the night. Forty of the 60 species of caddisflies collected during this study are new distributional records for Kentucky.

Using diversity per individual as a measure of community organization (Brillouin's formula), species diversity estimates of the adult caddisfly fauna have been calculated for 85 quantitative samples. Flight activity, frequency and seasonal range of abundance, and sex ratios of *Athripsodes* spp., *Cheumatopsyche* spp., and *Hydroptila* spp. are discussed. Sex ratios of *Athripsodes ancylus* (Vorhies) adults from light trap collections and mature pupae from benthic stream transect samples, both showed that the ratio of females to males was 112:100.

Blood Clearance and Tissue Uptake of Aminoglutethimide. JAMES F. BELLOT and WILLIAM J. BRETT, Department of Life Sciences, Indiana State University, Terre Haute, Indiana 47809.——Chemical and radioactivity labeled (^{3}H-AG) aminoglutethimide (AG) were injected into the right marginal ear vein of New Zealand white rabbits. Blood samples and tissues were assayed by chemical and radiotracer techniques in order to elucidate the site and mode of action of the drug. Chemical and radiotracer assay methods showed the blood concentration of aminoglutethimide to decrease rapidly for the first 30 minutes and

then level off. Uptake of the drug appeared to be general in that all tissues assayed showed evidence of its presence; however, certain tissues, like the pituitary, showed specific uptake because of high concentrations of aminoglutethimide found in these tissues. Both kidney and liver were shown to function in clearance of aminoglutethimide from the blood.

NOTES

Coccidia from the opossum, *Didelphis virginiana* (Kerr).[1] THOMAS JOSEPH, Department of Biology, Indiana University at South Bend, South Bend, Indiana 46615.——Twenty-eight road-killed and 15 live-trapped opossums from St. Joseph's, Elkhart, La Porte and Marshall Counties, Indiana were examined for coccidia by the zinc sulfate flotation technique. *Eimeria indianensis* was found in three of the road-killed and one of the live-trapped animals (2). The exogenous development of this organism was studied in detail. Two species of isosporans were also observed. One of these, a tissue sporulating species, recovered from two road-killed animals resembled *Isospora boughtoni*. Two attempts to transmit this species experimentally to two caged opossums were unsuccessful. The other isosporan, also recovered from two road-killed animals, was similar to an *Isospora* sp. described from an opossum in Alabama (1). Comparison of photographs of the two species showed that the *Isospora* sp. from Indiana was distinct from the one described in Alabama. Since only a few oocysts of this species were available, experimental transmission was not attempted. As the opossum is an omnivorous animal, it is possible that a few oocysts in its feces could have come from another host eaten by the opossum. Therefore, the two *Isospora* spp. cannot be considered true parasites of the opossum until they are successfully transmitted to captive opossums, or opossums with patent infections with these species are live-trapped and studied.

Literature Cited

1. ERNST, J. V., C. COOPER, JR., and B. CHOBOTAR. 1969. *Isopora boughtoni* Volk, 1938 and *Isopora* sp. (Protozoa: Eimeriidae) from an opossum, *Didelphis marsupialis*. Bull. Wildl. Dis. Assoc. 5:406-409.

2. JOSEPH, T. 1974. *Eimeria indianensis* sp. n. and an *Isospora* sp. from the opossum, *Didelphis virginiana* (Kerr). *J. Protozol.* 21:12-15.

Observations on Sea Snakes at Ashmore Reef, Timor Sea.[2] SHERMAN A. MINTON, Indiana University Medical Center, Indianapolis, Indiana 46202.——Ashmore Reef lies at the edge of the continental shelf between Australia and Timor. It harbors a dense population of sea snakes of several species. Snakes of this and some associated reefs were studied by the R/V *Alpha Helix* expedition in January 1973. Submerged snakes were observed by snorkeling and with scuba gear. Snakes at

[1] Supported by grants from the Indiana Academy of Science, the Society of the Sigma Xi and the Office of Research and Advanced Studies, Indiana University.

[2] This work was supported by the National Science Foundation under Grants NSFGA35835, GA34948, GD34462 to the Scripps Institution of Oceanography for operation of the ALPHA HELIX Research Program.

the surface were captured whenever possible. A total of 415 snakes was collected and numerous others observed.

Two endemic species, *Aipysurus foliosquama* and *A. apraefrontalis*, seem to be largely confined to water not more than 10 meters deep. They are small snakes, quite similar in appearance. Although occasionally found together, *A. apraefrontalis* seems to prefer a sandy bottom with sparse coral, while *A. foliosquama* prefers areas heavily grown with coral.

Emydocephalus annulatus, *Aipysurus duboisii*, and *A. fuscus* appear to be basically shallow water species, although all were observed at least once in the 12- to 25-meter zone. All prefer areas of moderate to heavy coral growth but are not confined to them. They tend to congregate along gullies and channels. *Emydocephalus* was the most frequently observed species at most dive sites.

Hydrophis belcheri and *Acalyptophis peronii* were never observed in the shallow water coral habitat but were obtained in good numbers at the surface in water 12 meters or more deep. An individual of *H. belcheri* was observed at a depth of 44 meters apparently foraging on the bottom. This species is almost entirely nocturnal in its surface activity; *Acalyptophis* shows nocturnal tendencies but is also seen during the day.

Aipysurus laevis and *Astrotia stokesi*, the two largest species of the area, were most often noted on the reefs at depths of 5 to 8 meters, but were also seen on numerous occasions around the ship when anchored in water 25 to 45 meters deep. *Aipysurus laevis* shows some degree of curiosity toward divers, but no undoubted instance of aggression was noted. It and *Emydocephalus* were the only species collected at all reefs visited.

Pelamis platurus was recorded on the basis of two juveniles collected and an adult observed. All were in relatively deep water. Observations from other parts of the range indicate this is prmarily a deep water, pelagic species. A single *Lapemis hardwickii* was netted from the ship while at anchor. This species is probably accidental and not a part of the regular reef fauna.

All species are specialized feeders. *Emydocephalus* feeds exclusively on fish eggs. *Hydrophis belcheri* feeds entirely on eels, and 80 per cent were one species which lives in burrows. Eels were the only food of *Aipysurus apraefrontalis*, but only a few were examined. *A. foliosquama* feeds on wrasse. *Acalyptophis* feeds mostly on gobies and heliophorids. *Aipysurus laevis*, *A. duboisii*, *A. fuscus*, and *Astrotia stokesi* eat a fairly diverse variety of reef fishes, but there is little overlap in their diets. Snakes tend to eat diurnal fish at night and nocturnal fish by day. The regular presence of venomous toadfish and scorpionfish in the diet of *Astrotia* is noteworthy.

Courtship of *Emydocephalus* was observed on several occasions at 4 to 8 meters depth. A female of this species with almost full-term embryos was also collected. Other species containing advanced embryos were *Aipysurus laevis*, *Hydrophis belcheri*, and *Astrotia stokesi*.