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INTERNATIONAL ASSOCIATION
OF ASTACOLOGY
I.A.A.

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NEWSLETTER

J.F. Payne and J. Huner, editors

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SEVENTH CONGRESS, INTERNATIONAL ASSOCIATION OF ASTACOLOGY -- Place: Lausanne, Switzerland. Dates: 3-5 August 1987. A post congress excursion for 6-8 August will involve visits to points of interest to astacologists in German-speaking Switzerland, France (Alsace), and West Germany (Bavaria). Registration fee is 220 Swiss Francs (SF) for participants and 110 SF for accompanying persons. Hotels: 1986 prices per night, breakfast, taxes and service charges included:

| | Hotels*****to **** with bath or shower | Hotels***to * without bath |
|-------------|---|-------------------------------|
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| double room | 220-150 SF | 80-38 SF |

Abstracts of poster or oral presentations in the areas of pathology, ecology, ethology, physiology, zoogeography, morphology and taxonomy, and aquaculture are due 30 March 1987 (1/2 page, A4, in English). For more information and copies of abstract forms, contact: Professor Pierre Goeldin, Directeur du musee Zoologique, 6 Place de la Riponne, CH-1005 Lausanne, Switzerland. The Tourist Office and Convention Bureau may be contacted at 60 Av. D'Ouchy, CH-1000 Lausanne, Switzerland.

MANUSCRIPTS FOR LAUSANNE IAA MEETING -- Professor Goeldin wishes to note: "All communications to the International Congress of Astacology at Lausanne will be printed and included in volume VII of Freshwater Crayfish. The text may be written in English, French or German with English summaries. Detailed instructions will be sent to authors but we know that the manuscripts will not exceed 8 pages, figures and tables included. Manuscripts not delivered before 1 October 1987 will not be printed."

TRANSPLANTATIONS COMMITTEE -- The committee will have a two hour session at Lausanne, 6-8 PM, 4 August 1987. Committee members are asked to discuss status of crayfish transplantations in their countries. Members include: Huner and Hobbs, Jr. USA; Hogger, Great Britain; Momot, Canada; Morrissy, Australia; Spitz, Austria; Vey, France; Odelstrom, Appleberg, and Forst, Sweden; Westman, Finland; and Habsburgo-Lorena, Spain. IAA members with news for the committee are invited to attend and present their information. If you have

(2)

information about transplantations, whether or not you will attend the Congress, please advise the committee chairman: Jay V. Huner, Chairman Transplantations Committee, P.O. Box 10809, Southern University, Baton Rouge, Louisiana 70813 USA.

NEWS ABOUT FRESHWATER CRAYFISH VI - (1) According to editor organizer Per Brinck, Freshwater Crayfish VI has been published and mailing is now in progress. (2) Edited by Professor Per Brinck, the book is based on the proceedings of the Sixth International Symposium on Freshwater Crayfish, held in Lund, Sweden in August 1984. The volume supplies an indispensable overview of current crayfish research. For the aquaculturist, it provides a valuable presentation of means and methods in crayfish farming and supplies the only major summation available of diseases and disease problems in aquaculture of crayfishes. The book is 281 pages and attractively bound. The book is available until 1 March 1987 from the Sixth International Symposium of Astacology, Ecology Building, S-223 62 Lund, Sweden. All orders must be prepaid by postal money order or bank check in U.S. currency or the equivalent in Swedish kronor (SEK) (\$1 US = 7.00 SEK). Price is \$30 U.S. plus \$5 shipping and handling for orders received before 1 March 1987. The symposium office in Lund will close after the date. Thereafter, direct inquiries to Professor Per Brinck, Ecology Building, S-223 62, Lund, Sweden.

IAA COSPONSORS AMERICAN SOCIETY OF ZOOLOGISTS MEETING -- This meeting is being held in Nashville, Tennessee (USA) 27-30 December 1986. IAA is listed prominently as a cosponsor. Our financial contributions include modest support of a social reception on Monday 29 December and student travel awards.

CRAYFISH PLAGUE CONFIRMED IN TURKEY -- According to Magnus Forst, the crayfish situation in Turkey is chaotic. The crayfish plague has spread widely and has reduced catches greatly. It appears to have been introduced by water fowl migrating from eastern Europe. The affected populations of *Astacus leptodactylus* seem to show some signs of resistance to the plague but not enough to prevent widespread mortality. No one can predict if and when the crayfish populations can recover. Research continues and a conference may be arranged in Turkey next year to address the problem.

CRAYFISH FARMING GETS STARTED IN MARYLAND(USA) -- According to an article in The Delmarva Farmer, 11 Nov. 1986, entitled "Crawfish; a promising 'alternative crop' emerges", Maryland farmers should grow 5.45 tonnes of crayfish this year and market them locally at \$4.62 per kg. There are now 45 farmers growing crayfish in Maryland, up from an initial corps of 8. More information may be obtained from Bruce Nicholls 123 A Remastico, Hebron, Maryland 21830 USA.

CRAYFISH CULTURE IN OKLAHOMA(USA) -- Success of crayfish culture in Louisiana continues to attract interest in other areas of the USA. Kenneth Williams is a fisheries research and extension specialist associated with Langston University (P.O. Box 730, Langston, Oklahoma 73050 USA) and the nearby Kerr Center for sustainable agriculture. He writes that "...I have four, 7 acre ponds stocked with 50 lbs/pond of Louisiana Red Swamp Crayfish. I do not think there will be any problem raising crawfish for bait, however, I'm not sure it will be easy to get food sized crawfish in one season here in Oklahoma. I also plan to try crayfish in various polycultures as a food supplement for fish. My goal in this would be to develop a polyculture suitable for Oklahoma that would be culturally acceptable, saleable, and profitable with a minimum of capital and energy inputs...."

CRAYFISH IN ARIZONA(USA) -- IAA member Malcom Comeaux (Dept. of Geography, Arizona State University, Tempe, Arizona 85287 USA) has sent interesting information from arid Arizona about crayfish in that state. He notes that crayfish are available most of the year with *Procambarus clarkii* being abundant in the spring. *Orconectes causeyi* is abundant in autumn. Baited nets are used in canal systems when water is present. Canals are drained in the autumn for renovation and crayfish may be captured by hand. Malcom plans to prepare a paper on the status of crayfish in his state.

(3)

CRAYFISH PLAGUE PROBLEMS IN GREECE -- Bulletin No. 8, October 1986 of L'astaciculteur de France carries an article entitled "La peche a l'ecrevisse dans la region d'Hipiros en Grece" by V. Theocharis (Station de Recherches de "Louros", Ministère grec d'Agriculture, Ionannina, Greece. According to Pierre Laurent, two important points were that 80 % of a lot of juvenile Pacifastacus leniusculus perished of aphanomycosis and that the natural crayfish population of Astacus astacus became ill of aphanomycosis two months after the importation of Swedish Pacifastacus.

CRAYFISH PESTICIDE DECIMATES SPANISH BIRDS -- This is the headline of a news note in the New Scientist (16 Oct. 1986, p. 24). According to the article, about 30,000 birds (species composition not given) in wetlands and rice growing areas near, but not in, the Donana National Park (near Seville) have died. An organophosphate pesticide(s) was thought to have been the cause of mortality. It was alleged that rice farmers applied the pesticide illegally to kill Procambarus clarkii that are damaging levee systems through burrowing. Additional conflicts involves permitting of crayfish "hunting" in the park itself during the last spring which was said to have resulted in destruction of 30,000 chicks and eggs.

MORE ABOUT PROCAMBARUS CLARKII IN CYPRUS -- According to Mrs. Daphne Stephanou (Ministry of Agriculture and Natural Resources, Dept. of Fisheries, Nicosia, Cyprus) the now established Procambarus clarkii in Cyprus were obtained from an aquarium supply company located in Singapore. It was incorrectly identified by the supplier as "fresh water red lobster Procambarus acutus".

PROCAMBARUS CLARKII IN ZIMBABWE -- New IAA member Don Watson (Nyamfuta Farm, Box 48, Guruve, Zimbabwe), has a permit to raise Procambarus clarkii in cement tanks at his farm. He is interested in all aspects of astacology and has tried, unsuccessfully to cultivate marron, Cherax tenuimanus, some years ago.

SOUTH CAROLINA CRAYFISH GROWERS ASSOCIATION -- The SCCGA publishes an informative newsletter each quarter. Editor is Bill Melven. An annual crayfish festival is held each spring in Pauleys Island, South Carolina. Regular membership rate is \$10 per year. Inquiries should be directed to David Jones, Secretary-Treasurer, Rt. 3, Box 188, Edgefield, South Carolina 29824 USA.

CRAYFISH CUISINE, ZAMBIAN STYLE -- The following recipes are favored by Zambian crayfish lovers who grow limited quantities of Procambarus clarkii. According to C. J. Grubb (P.O. Box 60287, Livingstone, Zambia), "We used peeled tail meat and soak it in ginger, lemon, and garlic and fry in batter. Of course, you can use lime or vinegar. The other favourite way is a simple curry of tail meat only. A good curry mix is 2 parts of coriander powder, 1 part turmeric and chilli powder according to how hot you want the curry. You also put in a small amount of ground aniseed or fennel seed, some ground ginger (fresh green rhizomes) and fresh garlic. We always start a curry by first frying our onions to a golden brown and then boiling all the rest with this. The Indians here boil the whole crayfish in their curry mix after taking the black line [gut] and I assure you it is delicious as everything is boiled so long that everything in the head boils into the soup. The Indian lady who used garlic, lime and ginger cooked the whole thing in the shell after slitting the animal open and putting the ingredients inside and then grilling...."

CRAYFISH VIDEO NOW AVAILABLE -- "Crayfish: A Culinary Crustacean" is a new video tape (10 minutes) from the Louisiana Sea Grant College Program. It traces the crayfish industry from harvesting (both wild and pond-raised) to processing. Formats are 3/4 inch U-matic (\$15.00) or 1/2 inch VHS (\$10.00). One can also send a blank tape. There is a \$2 charge for postage and handling of each blank tape. Charges are in US dollars and inquiries should be directed to the Louisiana Sea Grant College Program, Communications Department, LSU Center for Wetland Resources, Baton Rouge, Louisiana 70803-7507 USA.

(4)

NEW ITALIAN CRAYFISH CULTURE TEXT -- The following review was provided by Pierre Laurent. Mancini, A. 1986. "L'Astacicoltura allevamento epesca del Gamberi d'acqua dolce", 180 pages, 74 figures. EDAGRICOLE Casella postale 2202, 40 100 Bologna (Italy), ISBN 88-206-2600-4, price, 16,000 lire.

This well presented book is the first in Italian devoted entirely to crayfish. The first four chapters deal with classical data on morphology, biology, pathology, taxonomy, and distribution of crayfish.

Chapter five takes up 41 % of the text and is devoted to rearing methods. The author gives much information here mostly on the practice of reproduction and artificial incubation.

Chapter six gives an overview on astacological investigations around the world. The last chapter describes the crayfish situation in Italy. Many data in this chapter are new-distribution of crayfish (Austropotamobius pallipes Lere.) in central and southern Italy and description of provincial crayfish regulations. A fine critical description of poaching methods, very popular and in extended use in Italy, is also made. Considerations on the causes of crayfish disappearances and proposals for restocking native populations terminate the book.

Thanks must be given to A. Mancini who is the first to give detailed information on the crayfish situation in Italy.

CRAYFISH CULTURE IN SWEDEN -- C. G. Hammarlund and A. S. Karlsson (IAA Past President) have authored an 11 page crayfish culture manual (in Swedish) entitled "Litet A B C.. om Kräftodling". New culture methods using narrow canal-type ponds are described. French and English language translations may be available. Direct inquiries to A. S. Karlsson, AB Simonorps Akvatiska Avelslaboratorium, S-270 35 Blentarp, Sweden.

CRAYFISH PROCESSING AND SANITATION WORKSHOPS -- The Louisiana Cooperative Extension Service (Knapp Hall, Louisiana State University, Baton Rouge, Louisiana 70803 USA) periodically conducts crayfish processing and sanitation workshop. These are organized by Dr. Michael Moody. It teaches plant managers the basics of controlling bacteria, using cleaners and sanitizers, and processing methods (cook time, chilling and storage).

PASTERIZATION METHODS TESTED -- According to news releases from the University of Southwestern Louisiana (Lafayette, Louisiana 70504 USA), Nellie Derise of the Home Economics Department is developing methods to pasteurize crayfish meat packaged with digestive gland ("fat") material. The digestive gland has a high microbial count and enzymes can hasten spoilage and deterioration of meat. The material is a distinct part of most cajun crayfish recipes but cannot be frozen. Results from current studies suggest that shelf life can be extended significantly with microwave treatment.

FRESHWATER CRAYFISH NOW LISTED AS A SEAFOOD COMMODITY IN USA -- Crayfish products have been highly regionalized in the USA despite significant production, 50,000+ tonnes annually. Seafood Business, The Magazine of Seafood Marketing and Management (Camden, Maine USA) has now begun to list data on the availability and prices of crayfish products along with other seafood products such as cod, shrimp, tuna, oysters, etc.

BURROWING CRAYFISHES IN OHIO (USA) -- IAA member Jim Norrocky (Rt. 1, Duchess St., Vickery, Ohio 43464 USA) has studied the natural history of burrowing crayfishes in the Mid-Western USA. He has studied the primary burrower Cambarus diogenes and the primary-secondary burrower Fallicambarus fodiens. In a recent letter, he comments about male C. diogenes. "The growth is interesting since it is still in Form I. Either they molt twice in a short period or molt Form I to Form I. I know many of the stream species such as O. (Orconectes) rusticus molt in late spring to Form II and to Form I in fall. I cannot get a handle on a pattern, if there is one, for these burrowers. I have caught some individuals that had not increased in size and judging from my clip marks, had not molted in a full year. Molt may be limited or controlled by food availability, etc. and in stream species, food, etc. is more abundant or available." Jim also notes "...The increase

(5)

In size of the crayfish, especially in height, would necessitate enlarging the burrow. Most crayfish appear rather snug. A 4 mm (3.9 mm) diameter increase would result in a good deal of dirt being excavated from a 3' [0.91 m] deep burrow. This could account for those small chimneys or mud piles seen at burrow entrances occasionally. The larger chimneys being [above] a new burrow."

BURROWING CRAYFISHES IN TASMANIA -- Dr. A. M. M. Richardson (Dept. of Zoology, Univ. of Tasmania, Box 252 C, GPO Hobart, Tasmania 7001 Australia) has sent some interesting papers on work with burrowing crayfishes in Tasmania (see recent literature section). The genus *Engaeus* includes species which occupy relatively large subterranean chambers some distance from standing water and unconnected to the water table. They reproduce and molt in these and several age classes may be present simultaneously. A list of publications and theses is available from Dr. Richardson. Current work includes studies of niche separation in sympatric species, the respiratory physiology of burrowing species, the reproduction and life history of burrowing and open water species, and feeding ecology.

ASTACOPSIS GOULDI IN THE USA?? -- Staff at the Inland Fisheries Commission of Tasmania have recently become aware of rumors that the freshwater species *Astacopsis gouldi* is a resident in streams in the USA. *Astacopsis gouldi* is otherwise endemic to Tasmania and its recent inclusion in the I.U.C.N. Red Data Book on Invertebrates as a "vulnerable" species has raised questions about its status in natural populations. As a consequence of this, rumors that the species has been introduced successfully to other regions need to be substantiated. If any readers are aware of populations of this species, we would be most grateful if they could inform us of them by writing to: The Commissioner, Inland Fisheries Commission, 127 Davelly Street, Hobart, Tasmania 7000, Australia. (Inquiry sent by Pierre Horwitz, Scientific Officer.)

JOHN WRIGHT CONTINUES RECOVERY -- Long time IAA member John Wright continues recover from a stroke and loss of two kidneys. Although his activity is greatly restricted, he is moving about well and catching up on correspondence. He regrets, however, that he will have to dispose of his crayfish hatchery in Newberry Springs, California. Individuals desiring more information may contact him care of The Newberry Crayfish Hatchery, P.O. Box 4278, Santa Barbara, California 93140 USA.

FRESHWATER CRAYFISH V STILL AVAILABLE -- Proceedings of the 1981 IAA Davis, California meeting are available at \$35.00 from AVI Publishing Company, P.O. Box 831, Westport, Connecticut 06881 USA. All earlier editions of Freshwater Crayfish are out of print.

MORE ABOUT EXPLOITATION OF *CAMBARELLUS MONTEZUMAE* IN MEXICO -- P. de B. Esther Perez Hurtado (c/o Enrique Kato Miranda, Depto. de Biología Experimental, ENEP-Iztacala-UNAM, Tlalnepantla, Edo. de Mexico, Mexico) sent interesting slides of tiny *Cambarellus montezumae* in a market in Mexico City. These are eaten in tacos and are available with other traditional foods such as nopales, fish tamales, and corixid (water boatmen-hemipteran insects) eggs:

BIOPHYSICAL COMPOSITION OF CRAYFISH AS INFLUENCED BY THE ENVIRONMENT -- This project is being conducted by Dr. M. W. Finerty (Dept. of Food Science, Louisiana State University, Baton Rouge, Louisiana 70803 USA). It is designed to determine if commercial crayfishes, *Procambarus acutus acutus* and *Procambarus clarkii*, bioaccumulate pesticides and heavy metals in the digestive gland and abdominal muscle. Crayfish are being collected in the Atchafalaya Basin and culture ponds. The affects of season and processing methods are being investigated. To date, data show that Louisiana crayfish represent no threat to consumers.

UNIVERSITY OF SOUTHWESTERN LOUISIANA (USL) EXPERIMENTS WITH A NEW CRAYFISH POND -- USL researcher and IAA member A. P. Gaude III (Director, Crayfish Research Center, USL, Lafayette, Louisiana 70504 USA) is studying a unique circular pond design that is a spiral,

(6)

canal-like structure. Pumps maintain a constant flow of water through its 0.4 ha of water courses. It is thought that this will facilitate harvesting and assure high water quality permitting maximum production of *Procambarus* spp.

CRAWFISH RESEARCH REPORT TO THE INDUSTRY 1986 -- This report provides summaries of crayfish research in Louisiana and was sponsored by Louisiana State University, the Louisiana Crayfish Farmers' Association, and the International Rice Festival. Coordinator was Dr. Martin Brunson (Rice Research Station, Crowley, Louisiana USA). The report includes information provided by Louisiana State University's Agriculture Center with 29 projects, the University of Southwestern Louisiana with 12 projects, and Southern University (Baton Rouge) with 2 projects including a cooperative one with the University of Kuopio, Kuopio, Finland. Contact Dr. Brunson for copies of the report.

EXPLOITATION OF COOL WATER CRAYFISHES -- Walter Momot has recently authored the following paper: Production and exploitation of the crayfish, *Orconectes virilis*, in northern climates. In: G. S. Jamieson and M. Bourne (eds.) pp. 154-167, North Pacific Workshop on Stock Assessment and Management of Invertebrates. Canadian Spec. Publ. Aquatic Science 92. He concludes "...At our present level of understanding, removal rates of 50 % for Cambarids and 70 % for Astacids seem to give long-term stable yields and so provide a reasonable conservative empirical estimate [for exploitation rates] until additional evidence is gathered."

UPCOMING CRAYFISH MEETINGS IN LOUISIANA -- (1) The Louisiana Crayfish Farmers' Association (LCFA) will sponsor its annual meeting during the day on 27 February 1987 and the Fourth Annual International Crayfish Tasting and Trade Fair during the evening of 27 February and during the day and into the evening of 28 February. The LCFA meeting will feature seminars for farmers, processors, food editors, jobbers, distributors, etc. Theme of the tasting and trade fair is "Louisiana Crayfish: Heads and Tails Above the Rest". Louisiana is the largest producer of warmwater crayfishes, accounting for over 80 % of the world's supply of freshwater crayfishes. These meetings will afford anyone interested in this industry with the opportunity to see it first hand. The meetings will be held in the Lafayette, Louisiana Cajundome. Official host hotel is the Lafayette Hilton which will provide special rates for participants [specify that you will attend the meeting to obtain reduced rates]. Further information may be obtained from Ms. Eva LeBlanc, Louisiana Crayfish Farmers' Association, P.O. Box 91544, Lafayette, Louisiana 70509 USA, Phone, Area Code 338, Number 235-7072. (2) The First Louisiana Aquaculture Conference will be held at the Hilton Hotel, Baton Rouge, Louisiana on 1 May 1987 and will be followed on 2 May by a field day at the Louisiana State University Aquaculture Research Station, also in Baton Rouge. Crayfish are featured at both events. Contact Dr. Robert P. Romaine, School of Forestry, Wildlife, and Fisheries, Louisiana State University, Baton Rouge, Louisiana 70803 USA for further information.

AQUACULTURE EUROPE '87 -- This meeting will be held 2-5 June 1987 in the RAI Exhibition Center in Amsterdam, The Netherlands. Over 1000 delegates are expected. Obtain information from The European Aquaculture Society, Prinses Elisabethlaan 69, 8401 Bredene, Belgium.

NEW AQUACULTURE TRADE PUBLICATION -- The Water Farming Journal bills itself as "North America's aquaculture newspaper". Published monthly, it features news about crayfish culture in each issue. Complimentary copies are available. US and Canada subscription rate is \$15 US per year. For others it is \$25 per year. Contact CT & A, Inc., 3400 Meyrey Dr., Metairie, Louisiana 70002 USA.

AQUACULTURE DIGEST FEATURES CRAYFISH QUARTERLY -- Aquaculture Digest (9434 Kearny Mesa Rd., San Diego, California 92126 USA) now features news about crayfish culture on a quarterly basis. Subscription rates are \$50 US per year, US, Canada, and Mexico, and \$70 US elsewhere (air mail, only).

NEW LITERATURE ON CRAYFISH BIOLOGY --

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MEMBERSHIP INFORMATION -- Membership in IAA is open to anyone interested in the study of astacology. Dues are \$20 US for the intervals between international symposia (2 or 3 years). A quarterly newsletter is published. Send funds/inquiries to: Dr. James F. Payne, Department of Biology, Memphis State University, Memphis, Tennessee 38152 USA.

TITLES FROM RECENT SYMPOSIA --

American Society of Zoologists' Program, Nashville, Tennessee 27-30 Dec. 1986

Tierney, A. J. and J. Atema. Boston Univ. Marine Program, Marine Biological Lab., Woods Hole, Massachusetts USA. Behavioral responses of crayfish to chemical feeding stimulants.

McCumber, L., J. Francis Marion College, Florence, South Carolina, USA. Cellular defense mechanisms in the crayfish.

Roer, R. D. and D. B. Roye. Univ. of North Carolina, Wilmington, North Carolina USA. Correlation of structural, biochemical and physiological differences between respiratory and transport filaments of crayfish gills.

Mittenthal, J. Univ. of Illinois, Urbana, Illinois USA. Discontinuities of pattern recurring after intercalary regeneration in the tail fan of crayfish.

IV International Congress of Ecology, Syracuse, New York 10-16 Aug. 1986.

Alexander, Jr., J. E. Univ. of Oklahoma, Norman Oklahoma USA. Predator avoidance by the pond snail *Physa gyrina* to the crayfish *Procambarus acutus*.

Brusk, C. A. and D. M. Dunham. Univ. of Toronto, Toronto, Ontario, Canada. Vision and communication efficiency in crayfish.

Crowl, T. A. Univ. of Oklahoma, Norman, Oklahoma USA. The effects of crayfish predation on snail community dynamics in a lotic habitat.

Daniels, R. A. New York State Museum, Albany, New York USA. Responses of established crayfish population to the presence of an invader.

Greening, H.S. University of Georgia, Athens, Georgia USA. Ontogenetic and seasonal variation in the diet of *Procambarus fallax*, a crayfish from the Okefenokee Swamp, Georgia USA.

Rahel, F. University of Wyoming, Laramie, Wyoming USA. Predator avoidance and resource enhancement among fish and crayfish.

LOUISIANA CRAWFISH: PERSPECTIVES OF A NEW WORLD TRAVELER -- This exhibition previously opened in February 1986 at the Lafayette (Louisiana USA) Natural History Museum. It is now scheduled to open at the New Orleans Louisiana Nature Center Inc. in mid-February 1987 and continue through May. The exhibition will feature global history and production of crayfishes; Louisiana crayfish species; crayfish morphology, behavior, and life histories; and the Louisiana crayfish industry. Organizers are Gaywynn M. and Albert P. Gaude III. The address for the Louisiana Nature Center Inc. is: 11000 Lake Forest Blvd., New Orleans, Louisiana 70127 USA. Phone: 504-241-9606.

IMPACT OF CRAYFISH PLAGUE ON TURKISH CRAYFISH PRODUCTION -- A late report from Professor Ossi Lindqvist (University of Kuopio, Kuopio, Finland) quotes a major Swedish newspaper as stating that before the plague struck, the Turks were exporting 10,000 tonnes of *Astacus leptodactylus* and that the industry supported 100,000 jobs.

IAA MEMBERSHIP -- Membership fee remains \$20 for the period between international congresses. Direct funds and inquiries to:

Dr. James F. Payne, President-Elect/Acting Secretary-Treasurer
International Association of Astacology
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1986 MEETING OF
AMERICAN SOCIETY OF ZOOLOGISTS
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THE CRUSTACEAN SOCIETY
INTERNATIONAL ASSOCIATION OF ASTACOLOGY
SOCIETY OF SYSTEMATIC ZOOLOGY



OPRYLAND HOTEL
NASHVILLE, TENNESSEE
Saturday-Tuesday, December 27-30, 1986
Meeting Hosted by Vanderbilt University
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Co-Chairpersons of Local Arrangements Committee