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THE FOOD INSECTS NEWSLETTER

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THE INSECT CLUB

Who knows.... with its insect cuisine and decor to match,
it could end up in the National Registry of Historic Places

Diner: Waiter, there's a worm in my chimichanga.
Waiter-. I'm sorry, sir, there are supposed to be 20 of them.

That's how the article in *People* magazine started out in describing the Insect Club, but *People* is only part of the avalanche of publicity the club has been getting since introducing its insect cuisine last February (see earlier item in the *March Newsletter*). But, staying with *People* for the moment:

"Yes, it has come to this. In downtown Washington, at the aptly named Insect Club, they are serving things that 4-year-olds try to feed their 2-year-old brothers when their parents aren't watching. Among the dishes to tempt taste buds at the restaurant-nightclub, open since last September, are mealworms Rockefeller and grilled cricket polenta.

"The seven buggy items -- which are on the house and just a small part of the eatery's New American menu -- are a culinary extension of the club's decorative theme. A 14-foot sheetmetal dragonfly clings to the outside wall; large praying mantises guard the door, a 50-foot caterpillar hangs from the ceiling

The Washingtonian's version began like this: "If Pee-wee Herman had taken a shine to entomology instead of skin flicks, he might have opened a place like the Insect Club. It is one big fun house where insects are not the things that scurry in the night, but our wacky friends with extra legs.

"We are talking high concept here, but one based on a simple premise: take an aging commercial space and transform it into a shrine to vermin. Make patrons enter through a termite mound, Put the deejay inside an anthill, cover-the walls with bug art, overhang the pool tables with spider chandeliers, and *voila*, essence of arthropod. The final touch: an oversized ant farm model along the stairs Even PBS never showed anything like this. But for all its bug fetishism, Insect Club is more cozy than creepy Just down the hall is a bug-festooned bar.... There's another bar downstairs, and the dance floor, where the twenty- and thirty-something crowd finds its rhythm in an eclectic mix of progressive, Latin, Motown, Hip Hop, and even an occasional Bee Gees hit. The effect is of a big house party, albeit in a house owned by someone in need of many years of therapy."

"Old bugaboos fall by the wayside" was the tide of John Lombardo's column in the *Washington Business Journal* for the week of March 12-18: "The idea of adding an insect menu to the club's regular menu was the idea of Joe Englert, one of the six owners of what is becoming one of Washington's hottest clubs." Lombardo assesses two of the offerings: "The chimichanga, stuffed with a creamy

pureed mealworm filling and well-complemented by a spicy sauce and a dollop of sour cream, was surprisingly good." And, "The cricket brittle, chock full of black chunks of that leaping orthopteran insect noted for the chirping notes produced by the male . . . was especially tasty." Choice of wines? Chef Mark Nevin "suggests a house cabernet sauvignon to go with the chimichanga and a nice rioja for the won tons."

The first article we saw was Judith Olney's column, "Olney in America" in the *Washington Times*. She says: 'Well, we hadn't had a bug binge since we ate that little sack of salted water bugs in Bangkok in May. We hadn't had any really good grub since '72 when Liberian natives fried plump white queen termites in palm oil until they tasted like crisp brains, and we knew from a recent *New York Times* article that serious bug tastings were on the rise."

Newsletter finances shaky See Treasury, page 9

Olney describes the clientele: "It's funny to see the staid crowd of government workers during lunch at the Insect Club: lawyers, FBI types, American Association of Retired Persons persons. They're eating good pizzas plump with grilled vegetables and house-made chorizo sausage. They're downing chicken wings, smoked salmon on shredded potato and leek pancakes, delicious vegetable burgers flavored with cumin that would be awfully easy to hide mealworms in But this night of experimentation is devoted to a different clientele. Strange human creatures in baggy pants, antennae caps, tasseled slippers haunt the premises. They creep in slowly. ('A place like this really doesn't get fashionable until after 10:30 when the night crawlers come out,' says the owner.)

"They down the gelatin cups with crickets, the cricket brittle, the mealworm won tons with Thai sauce. 'I always hated Pinocchio,' claims one night denizen. 'It's a pleasure to eat Jimminy Cricket with justification. I hope I'll start chirping tonight.'"

Olney quotes Nevin: "Noontime customers seem to enjoy the chocolate-covered peanut butter cups with crickets that we've been sending out *gratis*. I've just added bugs to some of our regular dishes, like vegetable burgers. It can only up the protein content. Try some cranberry cricket polenta."

The crickets have a certain nutlike savor, according to Olney, "Pretend the cricket rolls are cracked seven-grain bread, spread them with garlic butter, and what's not to like?" Fried mealworms, in a sort of trail mix with Pepperidge Farm Goldfish 'taste a bit like

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Recent Technical Papers

Kevan, P.G.; Bye, R.A. 1991. The natural history, sociobiology and ethnobiology of *Eucheira socialis* Westwood (Lepidoptera: Pieridae), a unique and little-known butterfly from Mexico. *The Entomologist* 110(4): 1146-1165. Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

indicating that insects in general may be a poor source of vitamin A. Of the insects analyzed, only honey bees may provide adequate vitamin A levels without need for supplementation. Squid were highest in (x-tocopherol, with insects ranging from 10.4 ug/g dry matter in male honey bees to 179.3 in cockroaches. Health problems from vitamin E deficiency have not been specifically documented in insectivores, and the authors conclude that levels provided by invertebrate prey in general meet dietary requirements. In a short-term feeding trial (one week) involving crickets and large, it was

Authors' Summary. *Eucheira socialis* is a unique member of the mealworms. The life history is described on the basis of observations from near Creel, Chihuahua and a review of the available literature. The larvae are quasisocial. Eggs are laid in masses beneath leaves of madrone trees (*Arbutus* spp.) and the caterpillars communally build and live within silken tents known as bolsas. These start as flimsy tents around which the heavy bolsa is constructed of double-stranded silk. The larvae forage nocturnally, following each other along silken trails. They start moving within the bolsa about half an hour after sunset and start to emerge 15 minutes later. The last individuals follow about 2 hours later. Each bolsa may contain up to 600 larvae and there may be over 200 bolsas on a single tree. The larvae inhabit the bolsas from July to April, and develop through 5 instars. When the larvae are disturbed, their reactions include arching and regurgitating an alkaloid-containing fluid. The whole larval lifestyle is one of defensive strategies which have a social component. They pupate suspended head down within the bolsa and this stage lasts 25-30 days. The adults appear to be nocturnal. The larvae and especially the pupas are used as food by various peoples in Mexico. The bolsas have been used for making boxes, bandages, flagging, and as paper for writing and painting. Habitat destruction by lumbering in the pine/oak forests is reducing the number of madrone trees and may be causing a decline in the range of this species.

Ed.: See the July 1992 *Newsletter* for another summary of these studies.

Pennino, M.; Dierenfeld, E.S., Behler, J.L. 1991. Retinol μ -tocopherol and proximate nutrient composition of invertebrates used as feed. *Int. Zoo YB.* 10: 143-149. Animal Health Center and Department of Herpetology, New York Zoological Society, 185th Street and Southern Boulevard, Bronx, New York, NY 10460.

Insects analyzed included (from commercial suppliers): cricket, *Acheta domestica*; small mealworm, *Tenebrio molitor*; large mealworm, *Xophobas morio*; waxworm, *Galleria mellonella*; honey bee, *Apis mellifera*. Wild-caught insects included: cockroach, *Blattella germanica*; gypsy moth, *Porthetria dispar*; dragonfly nymph, spp. unknown; dung beetle, spp. unknown from Tanzania. Other invertebrates: krill, *Euphasia pacifica*; squid, *Loligo pealei*; earthworm, *Lumbricus terrestris*; slug, *Arion subflavus*; and crayfish, *Procambarus blandingi*. The authors state that mealworms, waxworms and crickets are the insects most commonly fed in zoos and aquaria.

Retinol and μ -tocopherol content are direct measures of vitamin A and vitamin E activity, respectively (two of the fat soluble vitamins). The two marine invertebrates, krill and squid, were high in retinol, but concentrations in insects were <2.0 μ g/g dry matter,

demonstrated that the vitamin E content of invertebrates used as feed can be altered by altering the dietary levels of this nutrient (significant only for mealworms).

In the chemical composition studies, percent water, and total N (N x 6.25 = crude protein), crude fat and ash as a percentage of dry matter varied widely. Values for crickets were, respectively: 73%, 10.3%, 19.9% and 4.2%; for small mealworms: 61.2%, 7.8%, 23% and 2.5%; for large mealworms: 55.6%, 7%, 44.9% and 8.6%; and for waxworms: 59.7%, 5.55%, 56% and 3.2%. Acid detergent-nitrogen (ADF-N) was determined as a measure of unavailable N (about 7% of total N), and neutral detergent fibre (NDF) as an estimate of chitin (averaged about 20% of dry matter). From these data, the authors discuss true protein values and, the nutritional importance of chitin both in animals with, and those without, chitinase activity.

DeFoliart. G.R. 1992. Insects as human food. Gene DeFoliart discusses some nutritional and economic aspects. *Crop Protection* 11(5): 395-399. Department of Entomology, University of Wisconsin, Madison, WI 53706.

This paper was written at the invitation of *Crop Protection*, a technical journal published in London, as an up-to-date overview of the subject for its Comment section. The last time the author saw the manuscript before seeing it in print, the title was simply, "Insects as human food. nutrition and economics." An author who would insert his own name into the title of his paper might appear somewhat immodest, so I take this opportunity to mention that I had nothing to do with it.

The subject is treated under four major headings: Traditional use and economic importance in non-European cultures; Nutritional value, Relevance to environmentally compatible pest management and sustainable agriculture; and Economic implications for industrialized countries. Subheadings under Nutritional value are Protein, Fat, Vitamins and minerals, Fibre, and Potential hazards. There are 45 references.

Technical journal reprints *Newsletter* article about palm weevils

PRINCIPES, Journal of the International Palm Society, has reprinted the article, "Hypothesizing about palm weevil and palm rhinoceros beetle larvae as traditional cuisine. tropical waste recycling, and pest and disease control on coconut and other palms-Can they be integrated?" which was published originally in *The Food Insects Newsletter*, 1990, 111(2):2-6. The reference is *Principes* 37(1): 42-47, 1993. Reprints are available.

Eating Palm-Weevil Larvae in Trinidad (an Extract from Leon Provancher)

Leon Provancher (1820-1896) was a French-Canadian priest and an ardent naturalist. Although he lived in the province of Quebec while it was still a very inward-looking society, and although he was very much a creature of the Church, Provancher traveled extensively and was apparently fluent in English. In 1868 he founded the influential journal *Le Naturaliste Canadien*, which continues today. A great deal of the journal was taken up with his own writings on a wide range of topics, and the freedom from editorial restraint allowed Provancher to expound at often great length. The various parts of his travelogue on an 1888 visit to various Caribbean islands, in particular, amount to a substantial book.

One of his shorter papers concerns the virtues of entomophagy and observations on bug-eating habits of various peoples. It is strikingly similar in argument to Vincent Holt's classic *Why Not Eat Insects?* of 1885. The following is a translated extract from Provancher's paper.

While in Port of Spain, Trinidad in May 1888, we stopped by Laventille one morning in the company of some Dominican fathers. Laventille is a hill outside of town with a chapel dedicated to the Holy Virgin, to which there are usually weekly pilgrimages. Walking atop a street that skirts the hill, we came upon a black man splitting a wooden log with his hatchet, and near him a little girl holding a teacup. "This man is looking for palm grubs," one of the fathers told us. "Let us stop a moment if you would like to see them." On approaching, we saw that the log was in fact the trunk of a palm, probably a coconut palm. It was about four or five feet long and in an advanced state of decomposition. Every blow of the hatchet exposed seven or eight big, very plump grubs, each about three inches long, which the little girl was eagerly gathering into the cup.

These larvae were truly handsome animals, of a lovely yellowish white and with six dainty feet near the front end.

"And do the black people eat these grubs?" we asked. "Oh no," we were told, "this food is too precious for the poor. They collect them for sale to the English gourmets, who relish them."

"What price do they fetch?" "A small cup such as you see there usually goes for a 'gourde'³, \$1." We estimated that this trunk would furnish at least two such cups of grubs.

These grubs are not the larvae of a butterfly but of a curculionid beetle, *Calandra palmarum* Fabr.¹ It is surprising that this insect, while certainly quite large, has a larva of a size equal to those of [Canada's] very largest beetles.

Notes:

1. Provancher, L. 1890. Des insectes comme aliment. *Naturaliste Canadien* 20:114-27.

2. Now a poor section of Port-of-Spain with a strong sense of its own identity. The name means "Little Wind."

3. A French creole term for a unit of currency, like "buck" in English. It literally means "gourd" or "calabash" and derives from the old use of gourds as currency in West Africa. Or (less likely) it may be taken to mean

"heavy." Thanks to Michael A. Lilla for this explanation. 4. Presumably *Rhynchophorus palmarum* Linn., the New World coconut weevil.

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Remember those chocolate-covered ants? They're still

"Once found in Gourmet Food sections in markets across the country, many of these items [exotic foods] have been discontinued and others relegated to the up-scale specialty food shops in the larger cities. Morris H. Kushner, former executive at Reese Finer Foods.

It was tempting to structure this story to appear as a piece of vigorous investigative reporting by the *Newsletter*, but, actually, it began as a "small world" story. In other words, by pure good luck. Your editor had a phone call from Sherrill Kushner, an attorney in California who also writes children's magazine articles and was at the time writing one on edible insects. During the conversation, she mentioned that her uncle, Morri Kushner, was formerly the executive in charge of imported exotic foods for Reese Finer Foods. This is the company that gave us not only those famous chocolate-covered ants but a wide assortment of other exotic and improbable foods. Ms. Kushner said she would ask Morri to contact me, which he promptly and graciously did, first by phone, then with some printed materials, and finally by letter dated May 1, 1993.

around but a lot harder to find.

In the letter, Mr. Kushner said: "Chocolate-covered ants and the list of exotics, especially the non-insect group, have not entirely disappeared from America's shelves. They have lost their widespread availability since the Reese era, but some specialty food stores still have them. Japanese food sections still feature ft-long legs, eel, baby octopus, sliced smoked octopus, quail eggs (a popular item with sources in Nebraska) and whalemeat. The wild animal group, in canned form, are almost non-existent; however, Yuppie restaurants across the country do serve some of these fresh. Emu farms, bear steaks, ostrich hamburgers are still proliferating."

Morris Kushner is a consultant to the specialty food trade, with which he has been associated since about the end of World War II. He is a former president of the National Association for the Specialty Food Trade, Inc., and continues as a contributing editor of the Association's magazine, *Showcase*. According to columnist Susan M. Kreifel in the *Lincoln [Nebraska] Journal of*

SEE CHOCOLATE-COVERED ANTS, P. 4

Chocolate-Covered Ants (from page three)

September 15, 1981, Kushner (a native of Lincoln) is credited with conceiving the idea of gourmet food sections in supermarkets. Specialty foods were formerly found only in specialty stores. Without Kushner, to quote Kreifel..... most of us probably never would have experienced the finer flavors of life -- like hearts of palm artichokes, caviar, *foie gras*, chutney, macadamia nuts and hundreds of other 'gourmet' foods . . . [and] we might not have as staples in our pantries croutons, sunflower seeds, Dijon mustard, olives, melba toast and chives, once considered gourmet fare." Kushner is quoted, "Today's specialty is tomorrow's staple."

Unfortunately, none of the insect items offered by Reese survived the transition from specialty to staple. The following inventory of Reese offerings is taken from a catalogue page (undated, but probably 1960s) sent to the editor by Mr. Kushner. All items except one were sold in 1 to 3 1/2 oz. tins:

Chocolate Coated Menagerie
(Ants, Bees, Caterpillars, Grasshoppers)
French Fried South American Giant Ants
Chocolate Covered South American Giant Ants
French Fried Grasshoppers
Roasted Caterpillars
Chocolate Covered Bees
Chocolate Covered Caterpillars
French Fried Bees
French Fried Silkworms

Listed non-insect items included Japanese Sliced Smoked Octopus, Japanese Baby Octopus, Japanese Smoked Froglegs, Japanese Seasoned Sliced Whalemeat, Japanese Smoked Sliced Whalemeat, Rattlesnake Meat, Quail Eggs, and Japanese B.B.Q. Snakemeat. Although not listed on the page we received, Reese apparently stocked animal items from antelope to turtle and everything in between, like bear, elephant, hippopotamus, iguana, kangaroo, lion, tiger, etc.

Why did Reese discontinue these products? In an interview with columnist Paul W. Lovinger in the newspaper, *San Francisco Progress*, January 1, 1975, Kushner mentioned among other factors the Federal Endangered Species Act enacted in 1969, and similar but more sweeping legislation in California in 1970. Conservationists were becoming critical of Reese's animal products, regardless of whether they might have been on any endangered lists. According to Kushner, "The pressure and change of times" compelled Reese to discontinue its "oddball" items, beginning in 1971. They were never good sellers anyway, except for rattlesnake, but formerly they had produced good publicity, not criticism.

they had to dispose of. Reese would buy a carcass at a high price and give it, frozen, to a cannery for processing. The meat went into little cans and demand was small, so 'a carcass went a long way. It wasn't that we were decimating the jungle.' The only big seller was rattlesnake, Reese's first wild food, which starting in 1948 was packed for Reese at a rattlesnake ranch in Florida.

"In bygone years if you bought a carton of CAMEL from Reese, you would get real CAMEL. 'Camel' is eaten in the desert. It's a staple food. A delicacy here is a staple food in the country of origin.' Kushner saw Del Monte and S & W cans on a Singapore "gourmet" shelf.

"As for that old picnic staple, ants, you don't have to be an anteater to eat them: 'We were the first to ever bring in the ants. They were Colombian ants, big as bees. On the coffee and banana plantations workers would cultivate their own claims of ants and at fiesta time they would use honey-dipped twigs to cook them over the fire like popcorn. We were the first to chocolate-coat them.'

"Our competitors went to Japan and brought in ordinary house ants, in chocolate. If ants like that were found in food it would ordinarily be considered contaminated. We went, to Washington to get it stopped.

'Reese had a contract with a well-known chocolate company. On receiving its first shipment of Colombian ants, 500 pounds, the latter made an excited telephone call to the headquarters of Reese Finer Foods: "Get your ants out of here! The men are threatening to quit.

In his letter to us, Mr. Kushner mentioned that he was once a contestant on the Groucho Marx *You Bet Your Life* Show. Groucho, who queried Mr. Kushner about his profession and the items he sold, said, "Mr. Kushner, I can't eat your chocolate-covered ants...the chocolate upsets my stomach."

Annual Review of Entomology article on biological control recognizes the food importance of insects

"Classical biological control may be an inappropriate technology in some Third World countries. Insects are often held in higher esteem in many cultures than they are in the West, and in many societies they provide 10% or more of the protein source (24). Alien entomophages or entomopathogens could significantly reduce local food resources (24).

Howarth, Francis G. 1991. Environmental impacts of classical biological control. *Annu. Rev. Entomol.* 36:485-509.

The reference cited by Dr. Howarth (24), is "The human use of insects as food and as animal feed," *Bull. Entomol. Soc. Am.* 35:2235, 1989,

Following, we quote the last several paragraphs of the Lovinger/Kushner interview: "Reese used to purchase its wild animals from zoos said the executive. The zoos would furnish lists of animals

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From *Cambio*, March 8, 1993, page 24. Thanks to Kevin Krajick of *Newsweek*, for sending this article and for translating it from the Spanish. The ants written about are the leafcutters of the genus *Atta*, several species of which are harvested as food in parts of Mexico, Central America and South America.

Thousands of Colombians are preparing to stock up in the coming days on a national delicacy that is equivalent - in its high price as well as its gastronomic value - with Russian caviar or French truffles. They have their wallets open and their palates ready to enjoy the annual harvest of *hormigas culonas* (big-bottomed ants). So called because of their protruding abdomen, the toasted ants constitute the highest attainment of Colombian cookery. Also the most expensive. By collecting and selling the ants, a campesino can earn during the three-month season, from March to May, the equivalent of a year of day wages. A pound (453 grams) of ants is sold for about \$20, the equivalent of six days of work at the minimum wage.

There are no statistics regarding the annual production of *hormigas culonas*, nor of those who occupy themselves in hunting, frying and selling them. It is a marginal activity that, however, has important benefits for many campesinos. Their sale is especially redeeming because the ants grow in zones of erosion, with little agricultural employment. Japan has imported the product, since in the Orient the insects are not considered strange.

The ant in the northeastern region of Santander is the only one of its kind in the world, and a difficult-to-obtain dish. One has to wait for the period of the insect's nuptial ceremonies in order to assault the ant hill in search of fertile specimens. Only the females arrive in the frying pan; the males lose their reproductive apparatus and die soon after sexual contact with their partners.

The consumption of ants is a tradition dating to precolumbian times. In 1540 Captain Martin Gaicano and his army conquered the

region and discovered that the Indians ate these insects, which they called ,copico... In the Guane language it means nuptial food, which refers as much to the time in the ants' life cycle in which they are captured as to the aphrodisiacal qualities attributed to this dish.

The cultivation of the culonas has been studied by experts in precolumbian economic organization. Although the Indians of the region had communal land and dwellings, the ant hills were private Property. The head man periodically portioned out this unique franchise. The Indians had the right to consume or barter ants, which were cultivated in small "farm,," surrounded by palm leaves.

The Spaniards at first limited themselves to describing this curious gastronomic custom with a certain disgust. "In the region of Butaregua and Chanchon [now the municipalities of San Gil and Socorro] one can find numerous colonies of ants that are eaten with much relish and, toasted, are kept in gourds so that they can be used for many months." After their initial repulsion, the Spaniards soon came to appreciate them and from there, they became intent on monopolizing the cultivation. This provoked such grave conflicts with the Indians that they finally desisted.

The culonas do not leave the ant hill every day, nor every hour -- only when it has rained a lot during the night and the sun comes out strongly the next day. This last condition usually forces the ant hunters to project sunrays with a mirror into the mouth of the ant hill. If they are given these circumstances, the ants will come out only during the morning.

Inside, under the earth, the fertile ants lay between 200 and 400 eggs a day. The first born from these eggs will be workers. The galleries that run through an ant hill are astonishing works of engineering that can measure altogether up to 100 meters. An ant hill shelters more than 5 million ants, and produces between half a pound and five or seven pounds of edible ants.

In order to avoid the bites of the insects, the hunters usually wear reinforced suits. The culonas are thrown into the pan alive, and afterward the wings and pincers must be removed. During the 90 days there will be a tumult of hunting in the rural areas of Santander and in the vicinity of the football stadium in Bucaramanga, where it is said the most aphrodisiacal ants grow. The inhabitants of the province continue to enjoy the almost millenium-old tradition of eating insects. Because of this, the ant forms part of the regional folklore, which an old, celebrated and ultra-macho couplet proclaims:

"The little ant of our Santander
--Pardon, Senora, the frankness--
Values herself in the same way
as a woman does:
By what she has behind,
not what she has on top."

(Note: this might also be read to mean: She values herself using her vanity--not her head.)

With information from M.C. Caballero and E. Gomez Mejia.

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According to tradition, a large edible insect was a favorite food of early Hawaiians

Quoted below are the first two paragraphs of the section titled, "A brief History of Hawaiian Entomology," in the book by Francis G. Howarth and William P. Mull, *Hawaiian Insects and Their Kin*, University of Hawaii Press, Honolulu, 1992 (page 13). Thanks to Dr. Howarth, Bishop Museum, for sending the excerpt.

"Early Polynesians knew of native insects and undoubtedly developed many cultural and oral traditions about these creatures of the Hawaiian Islands. The Hawaiian creation chant mentions many native insects -- dragonfly nymphs were used in rituals, and native moth caterpillars still are 'aumakua' (guardian spirits) for some Hawaiian families.

"Hawaii was the first country to put a picture of a butterfly on a postage stamp, in a two-cent issue in 1891. Unfortunately, many Hawaiian traditions about insects were lost before they could be recorded. One that did survive involves the existence of a large cricket-like animal, called the 'uhini pa'awela' in the Ka'u District of the Big Island; it was a favorite food among the Hawaiians there until the late 1800s. A few of these animals roasted on a skewer provided a full meal. No specimens of the 'uhinipa'awela' survived, and we can only speculate that it may have been a giant weta-like *Banza katydid* or a *Thaumetogrillus* cricket."

From Papua New Guinea - more about the sago grub

There have been several articles and letters about palm weevils, including the famous sago grub (*Rhynchophorus ferrugineus*), in past issues of the *Newsletter*. Tom Slone, Berkeley, California, recently sent several xeroxed pages of the book *A Guide to Bush Foods, Markets and Culinary Arts of Papua New Guinea*, by R.J. May, published in 1984 by Robert Brown & Associates (Aust) Pty. Ltd. (P.O. Box 29, Bathurst, N.S.W. 2795 Australia). We quote from page 95 concerning sago grubs: "Usually the grubs are either boiled or roasted over an open fire. In the Maprik and Angoram (East Sepik) markets, and probably elsewhere, they are often sold pitted and grilled like satay. They are tender and very sweet with a slightly nutty flavour. The adult beetle is also eaten. " For those with access to a good supply of sago grubs, a recipe is offered on page 144.

Tabular data on nine animal foods summarized by the author from other sources show the sago grub second only to pork (medium fat) as a source of energy (760 kilojoules/100 grams), highest in calcium (461 mg/100g; molluscs were second highest at 150 mg/100g), and highest in riboflavin at 150.43 mg/100 g; saltwater fish, fatty, were second highest at 0.21 mg/100 g. The grub was also a good source of iron. The data are apparently on a fresh weight basis.

The author mentions a variety of other insects that are collected and eaten,

For readers who have asked about the edibility of spiders

Two items on spiders have crossed our desk recently, which about equals the number of requests received for information on the edibility of the arachnid class. Linda DeFoliart, Hotchkiss, Colorado, called attention to a short article, "On the Menu: the Giant Tarantula of Amazonia," in the March 1993 National Geographic. The species is *Theraphosa leblondi* which can "comfortably span a ten-inch dinner plate," and which Piaroa Indians, among other tribes, consider delicious.

Filmmaker Nick Gordon and scientific adviser Rick West chronicled the natural history of the spider in central Venezuela, then joined in a feast. The blessing of the spirits was invoked by a shaman before the hunt. "By twitching a vine in the tarantula's burrow, imitating the movement of an insect, a hunter lures the ground-dwelling giant from its lair." The spiders are tucked into bundles of leaves and kept alive until cooking. After singing off the barbed hairs, the legs and thorax are barbecued. They taste much like shrimp, according to Gordon and West.

Maybe it's all in knowing what to do and how to do it when it comes to food, and maybe the *Newsletter* has been remiss in so completely ignoring the Arachnida. Spiders are also eaten in Papua New Guinea (see next article), and elsewhere, and Dr. Yvres Provost of Lakehead University in Canada reported finding nothing wrong with the scorpions he was served while in China (see last *Newsletter*).

mostly by children. They include the larvae of beetles, butterflies, moths, wasps, and dragonflies, and adult grasshoppers, crickets, stick insects, cicadas, moths and beetles. Wasp nests are cut down over open fires "providing an earth oven in which the larvae are baked." The adult moths are scorched, or in the Sepik, wrapped in sago leaves and smoked. Along the Sepik River, when mayflies appear in large clouds, they are skimmed from the water when they fall and eaten raw or put into sago pancakes. The author mentions that the large orb weaving spiders of the genus *nephila* are also considered a delicacy. They are plucked by the legs from their webs and lightly roasted over an open fire. Other species of spiders are also eaten.

Readers wanting more information about the insect foods of Papua New Guinea can consult the following technical article: Meyer Rochow, V.B. 1973. Edible insects in three different ethnic groups of Papua and New Guinea. *Am J. Clin. Nutr.* 26:673-677.

Who learned from whom?

Most of the termites that are eaten are the winged males and females which are collected as, or after, they emerge from their earthen mounds on their mating flights. In some localities, people also eat soldier termites. As the soldiers have no wings, they are collected by inserting a slender twig or blade of grass into holes in the mounds. The soldiers clamp onto the intruding twig or blade with their large mandibles and are drawn to the surface, 10- 15 at a time. Chimpanzees use exactly the same method for collecting soldier termites.

Letters In Congo -- trying to undo the effects of imported Western bias

Dr. Gregoire Bani, of the Laboratoire d'Entomologie Agricole, Brazzaville, Republic of Congo, wrote on January 29, 1993:

"Thank you for the *Food insects Newsletter* which I have been receiving for a few months. I am preparing a manuscript on the use of insects as food in Congo. I shall send it soon. I find this newsletter very interesting to break many preconceived ideas on this topic. In my country for example, many people are fond of many food insects but a lot of them do not show it because they think that edible insects are 'uncivilised' food. I think it might be the same in many other African countries."

In Papua New Guinea -- also trying to undo Western bias

Under date of June 5, 1993, Larry Orsak, Director of the Christensen Research Institute, Madang, PNG, wrote in part:

"As one who once assisted another graduate student prepare "insect meals" for ravenous students at a U.C. Berkeley dormitory,. I'm pleased at the *Food Insects Newsletter's* spread and impact. Here in Papua New Guinea, we regularly eat insects, not necessarily cooked. The fare includes giant orb-weaving spiders, giant stinkbugs and other exotica. The sad thing is, New Guinean villagers are coming to believe that this is "bush kanaka" behavior, something to be discarded as they enter the developing world. More and more frequently, they are likely to forego this cheap source of protein in favor of expensive "tinned fish" or corned beef. Status is a very important need to be met in Melanesian culture, and buying, instead of collecting protein fits into the syndrome. But spending the little money they have on unnecessary things can be debilitating in a country where all school children must pay school fees, and thousands of villagers remain largely outside of the cash economy. Suffice it to say that I spend a lot of time lobbying people to stick to the bug-eating ... as one of their pathways to development!"

**Insect tasting display at Kansas State University
Open House gets press coverage**

From Dr. C. Michael Smith, professor and head of the Department of Entomology, dated January 29, 1993.

Thank you for including me as a subscriber to the *Food Insects Newsletter*. I've been reading the newsletters of Alberto Broce, a faculty member in our department, for the last two years. I first did an insect cooking lecture in an "Insects and People" class I taught at the University of Idaho four years ago and have been doing this occasionally ever since. I do Ag in the Classroom training for high school teachers in the summer and many are-, highly enthusiastic of information on cooking and consuming insects as well as insect nutritional value.

Attached are some press clippings from the Kansas State University Open House last fall. Our insect tasting display was quite a hit, although I've not found a way to effectively compete with the Grain

Science and Milling Dept. which provides donut and cheese-puff samples. The clippings from the Hutchinson, Kansas *News* were also interesting. First, that we made the paper in a rural city near urban Wichita and second the response that article drew. In contrast to Mr. Dressier's response I did have several fanning families can me inquiring about recipes for cooking with insects!

More U.S. Cookbooks to include insects in the future?

From Amy Rosmarin of New York City:

"This is the best newsletter I've ever seen. I'm putting together a cookbook -- *Serving Odd & Elegant* -- and now hope to include some insect foods. Thanks."

Ed.: We swear that we didn't print Amy's brief note because it contains a nice compliment for the *Newsletter*. We thought it of interest to readers that there may be a new U.S. cookbook that contains insect recipes. And, we know of at least two more that are underway.

From a student (fifth-grader?) in Delaware

January 22, 1993. Dear Dr. DeFoliart:

I just wanted to thank you for your time with my trend story on eating insects. I enjoyed reading *The Food Insects Newsletters* and the article you sent me. The story will be in the next issue of our school paper- (Although I haven't even written it yet, the teacher was so impressed by my sources that she wanted it in soon.) I'll send you a copy as soon as it goes to print. Thanks again. Scott A. McLaughlin [signed], Hockessin, Delaware.

Ed.: *The Newsletter* hears from several dozen students per year. They are not only writing for school newspapers, but exploring insects as food in biology projects, Science Fairs, forensics and university term papers. Read on.

From an 8th Grade Science Fair Winner in Toledo, Ohio

Dear Dr. DeFoliart,

I sent you my finished report on 'Insects: The Inside Story.' Thank you very much for all your help. I learned a lot about this subject, and I'm also surprised that there are so many other interested people out there. The pamphlets helped me out a great deal, too. In fact, in one of the *Food Insects Newsletters* there was a recipe for worm fritters, and for the science fairs I went to, I cooked them for my judges. Only one judge would eat them, unfortunately. Also (just on a more curious note), at my school I realized that my famous worm fritters were eaten more by the little girls and older women. The older men shrunk at the very idea, and only about three boys tried the "infested" food for the mere purpose of showing off in front of the more timid girls that refused to even look at bugs. So, maybe if we introduce the idea of eating insects to women, they will agree and eventually, men will follow! (Okay, so maybe I'm jumping the gun!)

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Letters (from page seven)

Seriously, though, I am impressed by this whole idea, how insects can be good, nutritional, environmental and inexpensive food. At my school, St. Pius X, I participated in their science fair, and after that I decided to go on to the Northwest District Science Fair at the University of Toledo. (I mentioned "decided" because since our school is so small anyone who wanted to go on could.) While there, my project won the Governors Award for Excellence in Agricultural and Food Science Research plus \$25.00 and a Superior which enabled me to go on to the State Science Day in Columbus which is this Saturday (the 17th of April). No matter how this turns out, I owe a lot to you for taking the time to help me out, I am sure that you are a very busy man no doubt!

I hope you had a nice Easter season, and your weather actually starts to look like spring (unlike ours).

Thanks again, Laura Gibson

Ed.: Laura's report was wide-ranging and excellent. She drew on many sources of expertise: an entomologist in Georgia-, a protein specialist at general Mills in Minneapolis (who conducted a protein analysis of her

spring workshops for local teachers and I have included entomophagy as a topic. I supply them with procedures and some hands-on experience as well as some ideas for experiments in the classroom. Not all the teachers are as eager to try this in their classrooms, but I know that I have converted a few! I make a point of making my recipes appealing and flavorful and most people are amazed that "insects don't really taste that bad!"

I'm sure that you get many letters like this every day, but I just wanted to let you know that you had a voice spreading the word about edible insects here in Tucson.

Caterpillar Crunch

1/2 tsp. ground cumin	2 Tbs. Olive oil
1/2 tsp. chili powder	2 C. shelled pecan halves or 1/2 tsp. curry powder
1 c. pecans & 1 c. pumpkin seeds	1/2 tsp. garlic salt
1/4 tsp. cayenne pepper	1 Tbs. Coarse (kosher) salt (optional)
1/4 tsp. ground ginger	Garlic salt (optional)
1/4 tsp. ground cinnamon	
Approx. 1 cup waxworms (or mealworms or crickets)	

mealworms and crickets in comparison to beef); the New York author of a recipe book; Ronald Taylor (author of *Butterflies in My Stomach*); a professor in medicinal chemistry at the University of Toledo; the Toledo Zoo; the Cincinnati ZOO. if even 10-20% of the next generation develop the kind of interest and appreciation that Laura has in the beneficial side of insects, it will be a better world for both insects and people.

From a graduate student at the University of Arizona

Under date of May 17, Robin K. Roche, wrote in part: I've written to you before. I am a graduate student in entomology at the University of Arizona and I have been interested in ethnoentomology and entomophagy for some time now. Early last fall I wrote you to ask if you knew of places where I could purchase more exotic insects (other than the standard mealworms and crickets that can be ordered from places like Rainbow Mealworms). You very kindly referred me to Dr. Fish of the New York Entomological Society and he was a great help and we enjoyed sharing our enthusiasm for cooking insects. He also ended up referring me to Dr. Tom Turpin (then president of ESA) and I was invited to help run the edible insect display at the Insect Expo in Baltimore last December. So, for all of that, I'd like to thank you for your letter.

At that time I was preparing a special Thanksgiving slide show and mini feast for our local organization, Sonoran Arthropod Studies. It was a great success! I love to cook and so I tried adapting some of my favorite recipes from *The Silver Palate* and other cookbooks. I served Hoapes de Grillon (cheese puffs with crickets), Caterpillar Crunch (spicy nut mix with fried wax moth caterpillars), and Chocolate Zoeys (chocolate covered *Zophobus morio* i.e., giant mealworms) to name a few. The Caterpillar Crunch and the Zoeys were the obvious favorites of the crowd. Since last fall I have several requests for the Caterpillar Crunch recipe. I probably will have a similar mini feast again this fall. Currently, I am teaching several

1. Preheat the oven to 325°F.
2. Mix the spices in a bowl. Set aside.
3. Heat the oil in a nonstick skillet over low heat. Add the spice mixture and stir well. Simmer to mellow the flavors, 3 to 4 minutes. Reserve a small portion of this mixture for frying waxworms.
4. Place the nuts in a mixing bowl, add the spice mixture and toss well. Spread the nuts in a single layer on a baking sheet. Bake for 15 minutes, shaking the pan once or twice.
5. Remove the baking sheet from the oven, and using a rubber spatula, toss the nuts with any spice and oil that have accumulated on the bottom of the pan.
6. Sauté the thawed waxworms with reserved spices over medium heat until the insects puff and begin to pop. Remove from skillet and drain on a paper towel.
7. Add insects to nut mix. Sprinkle with the coarse salt, and a bit more garlic salt if desired. Let rest for 2 hours in a cool place. Store in airtight jars. Makes two cups.

University student in England designing "packaging" for edible insects

Under date of April 7, David Colderley writes, in part:

I am a student in my fourth year on a Degree course in Graphic Design at the University of Central Lancashire at Preston in the United Kingdom. As a part of my course I have chosen as one of my projects a brief to design a range of packaging for edible insects, and also an advertising campaign to make people more aware of the possibility of being able to eat insects. I have found a few articles on the subject, including the one featured in the Benetton clothes magazine 'Colors' but I am finding it difficult getting hold of any research material. Therefore I am writing to see if you have any information available, or that I would be able to get hold of (books, leaflets)....

If you have never made a contribution in support of *The Food Insects Newsletter*, or haven't in a long time, a contribution of \$5, \$10, or more would be most appreciated. Printing and postage costs are now running to more than \$1500 for each of the three mailings per year, and costs entailed in responding to hundreds of pieces of correspondence boost the annual total to well over \$5,000. During the past two years, two small grants, one from the Agrecol Corporation and one from the UW College of Agricultural and Life Sciences have helped keep *the Newsletter* operating in the black. In the current year, as well as in past years, reader contributions have covered only about one-third of the costs. So, please think about writing a check today.

Address on page 11.

Locust and Grasshopper Populations Plague Mexico. *Inside APHIS* 13(3): 10-11, May/June 1993, by Kris Long, Bureau of Land Management, Idaho State Office.

Inside APHIS is an in-house newspaper of the USDA. We thank Dr. Jim Mertens, Ames, Iowa, for sending a copy of the report. It's always good news when government officials and researchers are open to the idea of insect harvest as a potentially viable option in dealing with pest populations in some situations.

The swarms, described as of "epidemic proportions," were centered in the Yucatan Peninsula and to the west in the states of Tlaxcala and Puebla. The highly toxic insecticide, methyl parathion, most of it applied -by way of backpack sprayers, has been the Mexican government's method of choice in combating the outbreaks. The government was also studying alternatives such as use of the fungal organism, *Metarhizium*, and harvest of the insects as food.

At the request of Mexico's Sanidad Vegetal (Agricultural Resources, Campaign Plant Protection), Gary Cunningham, project director for PPQ's Grasshopper Integrated Pest Management (GHIPW project in Boise, Idaho, flew to Mexico in late October to tour the hardest-hit areas and recommend new pest management approaches. According to Cunningham, "The swarms I saw were rather small, perhaps 30 yards square. But one can see 20-30 swarms per acre, and they can go for miles and miles. It's quite a sight"

and niacin and are quite nutritious. In fact, these insects are eaten and relished in many parts of the world. In Asia and Africa, they are fried, roasted, or ground to be mixed with flour.

While Cunningham was in Puebla, an extension specialist from Mexico City was demonstrating grasshopper recipes learned from natives in the nearby State of Tlaxaca; grasshoppers and other insects have been part of their diet since before the Spanish Conquest.

Cunningham purchased a pound of the freshly prepared Sphenarium in a Puebla market for 4,000 pesos, or about \$1.25. The recipe was simple and, according to him, complimented the insect's hearty flavor.

The natives gather grasshoppers in a sweep net and place them in water for 24 hours. After the insects are drained, they are then placed in boiling water for about 30 minutes, adding salt and garlic. Corn husks are added to give them a darker, more delicious flavor.

"The GHWM project looks at everything from biologicals to decision support systems in its effort to better manage grasshoppers," says Cunningham, "but we have not yet been successful at getting the U.S. population to eat grasshoppers."

Cunningham made a number of recommendations, among them the use of baits like wheat bran or robed oats impregnated with small amounts of less potent insecticides such as malathion or carbaryl, and that Mexico expand

We quote in full a part of the article which is headed: A Little Salt with Your Grasshoppers?

Another alternative being pursued by the Mexican Government is the use of grasshoppers as a food source. The idea of eating insects, while perhaps foreign to most Americans, is not new. Studies have shown that grasshoppers are high in protein, calcium, phosphorus,

First Record of Pawnee Indians Eating Grasshoppers?

Neil Hunter of Plainwell, Michigan, sent the old newspaper clipping below with this note, "From 1924 *Pathfinder* weekly paper:"

Indians Ate Grasshoppers

I saw an article in your magazine about Indians eating grasshoppers. About 70 years ago my grandfather was agent for the Pawnee Indians on their reservation in what is now western Nebraska. I have often heard my father, who was then a boy, tell of those Indians eating grasshoppers and the interesting way in which they caught them. They would dig a deep hole in the ground and then, choosing

its biological control options to consider another fungal organism, *Beauveria*, along with *Metarhizium*. The article is accompanied by a photograph of Cunningham holding a fork and a bowl of grasshoppers, and captioned: "Although Gary Cunningham ... readily shares his grasshoppers with employees in his office, he admits that he has a fair amount left."

a time when there was no wind and when a fire would bum on the prairie slowly and could be kept under control, they would encircle several acres around this hole with a ring of fire and drive the hoppers into the hole and capture them by the bushel. They were then dried and ground into meal to be mixed with their corn meal and made into bread. A.L. Giflis, Mt. Pleasant, Iowa.

Ed.: There are more than 250 papers that report the use of insects as food by North American Indian tribes, mostly in the western part of the continent. While the harvest method described above is similar to those in many other reports, I do not recall any other records pertaining to the Pawnees nor to grasshopper harvesting from as far east as Nebraska.

World Conservation Monitoring Centre. 1992. *Global Biodiversity: Status of the Earth's Living Resources*. Chapman and Hall, London, xx + 594 pp.

Helen M. Smith, Invertebrate Conservation Officer of the WCMC is author of a subsection on invertebrates (pages 361-364, part of a section on Uses and Values of Biodiversity). Four tables relevant to edible insects are: Selected insects used as a human food resource (showing scientific names [63 species or general, life stage normally consumed, and area(s) where eaten; Countries with honey production at or in excess of 10,000 tons in 1989; Nutritional values of selected vertebrate and invertebrate products (proximate analyses of 8 vertebrate and 19 insect species); Efficiency of food conversion for selected animals (6 vertebrates, 29 insects). From the tabular data, the author notes that, nutritionally, insects compare well with other animal products, and that efficiency of food conversion to biomass is also favorable.

Other points made: "Some species are dried and sold to quite a large market and are important in the local economy"; "The seasonal abundance of certain species makes them especially important at times of year when other food resources may be lacking; "Despite the widespread use of insects and other invertebrates for food, they represent an under-exploited resource"; and, "Many species which are agricultural pests are also used as a food resource in some part of their range, or have the potential to be utilized."

The sources of insect data cited are among those familiar to students of the subject, but this report is significant because it is another demonstration that organizations such as the WCMC are increasingly recognizing the global importance and potential of edible insects. The WCMC is a joint-venture between the three partners who developed the World Conservation Strategy: The World Conservation Union, United Nations Environmental Programme, and World Wide Fund for Nature (formerly World Wildlife Fund). Its mission is to support conservation and sustainable development through the provision of information on the world's biological diversity.

Further, the report was written by someone who was not already a dedicated promoter. In a letter to the *Newsletter* editor, Ms. Smith said:

"Personally I must admit I have never purposefully eaten anything invertebrate except for the odd prawn when there is nothing else available (I am not a great fan of seafood and no one will ever persuade me to try an oyster!). I would be fascinated to try some other (terrestrial) invertebrates as long as someone else prepares the food since I have no interest or expertise in cooking whatsoever! (The editor must admit that he and Smith are in the same company when it comes to lack of personal interest or expertise in cooking.) If you happen to know of any restaurants etc. which sell insect (etc) foods in the LJK I would be most interested."

Wisconsin entomologists give "thumbs-up" to "Pupae Puffs"

Pupae Puffs in this case were pupae and prepupae of two kinds of wasps, the relatively large bald-faced hornet, *Dolichovespula nwculata*, and the smaller German yellowjacket, *Vespa gennwnica*. The term, "Pupae Puffs," was coined by the chef for the occasion, Marsha Lisitz, formerly in the medical entomology laboratory and now with the Wisconsin Eye Bank. About 60-70 people (faculty and students) showed up on October 30, 1992, for the afternoon tasting event in the Department of Entomology conference room. The pupae were deep-fried in peanut oil for about 15 seconds. In their unseasoned natural state, the Puffs had a mild nutty flavor. Optionally, garlic salt could be added.

A rating form had been devised, but unfortunately, only 35 copies were available. The Puffs averaged a rating of slightly above 8. On a scale of 1-10, with 24 tasters rating them at 8, 9 or 10, and 11 tasters rating them at 5, 6 or 7. Three people rated the two species separately, two slightly favoring *Dolichovespula*, and one slightly favoring *Vespa*. To the question, "In your opinion would additional flavors, such as lemon-pepper, Cajun, or others, enhance the product?" 14 respondents checked "yes" for lemon-pepper, 16 yes for Cajun, 5 wrote in "garlic," 2 wrote in "salt," and 3 wrote in other flavors.

Comments (with the rating given by the person making the comment in parentheses) included: "They were delicious plain!" (10); "These are the most extremely tasty creatures I have ever had." (10); "A bit greasy, how about air popping?" (10); "Fried more deeply would be better." (9); "They would make good appetizers." (9); "Thanks. It's only weird when their eyes look at you." (8); "Very rich, couldn't eat too many." (8); "Would be very good for breakfast." (8); "Surprisingly good!" (8); "I have tried drone bee larva in Indonesia, it was better." (7); "Just don't look them in the eye!! Good!" (7); "Need to add some seasoning." (7); "I would like them better if they were crunchier." (6); "I guess I would like them better if they were a little crispier. More like a potato chip." (6); "[They need] lemon or fine herbs added such as parsley, basil, oregano, etc." (5).

The pupae became available as the result of a small grant from the Agrecol Corporation which was used to motivate a summer student employee in Professor Robert Jeanne's social insects lab to put in some overtime nest collecting.

Another round of free publicity for Don Chon's in Mexico City -- A good omen for the Insect Club!

Don Chon's probably gets more publicity in the U.S. media than any other restaurant located in Mexico. Year after year, writers are inspired to write about the wild foods served up, including the insect dishes at prices of \$20 to \$30 a plate. In the latest round, readers sent in clippings from *The Atlanta Journal*, *The Atlanta Constitution* of May 24, 1993 (sent by Dr. Murray Blum, University of Georgia, Athens), the *Arkansas Democrat Gazette* (Little Rock) of May 29, (sent by Ms. Jessa Dean Scott of Rogers, Arkansas, who happens to be the editor's sister), and *The San Diego Union Tribune* of June 11 (sent by Mr. Tom, Higgins of San Diego). If advertising is one of the keys to business success, and if The Insect Club can continue to inspire writers for as long as Don Chon's has, it will get a very high return indeed on its advertising dollar!

The Insect Club (from page one)

corn nuts. " Along the way, Olney and some of the other articles work in information on insect nutritional value, their importance in some other countries, and some of Nevin's techniques preparing them.

The club's fame is not limited to the United States. It was mentioned in the Italian periodical, *Panorama*. In a letter to this editor (*Newsletter*), dated May 11, Chef Nevin said, in part: "Every week more and more people are coming in and asking for insect food...I've been getting phone calls on a daily basis from reporters and laymen from all over wanting to know more about insect cuisine. In addition to those mentioned above, the club has been featured on MTVs "Week in Rock," a BBC video story, and the Entomological Society of America Newsletter, and there are upcoming stories in the *Orlando Sentinel* and on CNN's "Real News for Real Kids."

Olney quoted Englert saying, "Bugs are simply the creatures of the 1990s. They will replace the dinosaur fad of the 80's." He may be right. The Insect Club is open for lunch and dinner Monday through Friday. Weekends, starting at 9 p.m., a bug-free, complimentary buffet is included with the cover charge. Phone (202) 347-8884. GRD

(Thanks to Chef Mark Nevin for keeping us informed about media coverage. Thanks also to readers Lisa Rohn (Maryland) and Dick Gorham (FDA, Washington DC) for sending clippings from the local press.)

Postponed:

The series of invited papers on potential hazards associated with the consumption of certain insect groups, which was scheduled to begin in this issue, has been postponed to the November issue.

First and last call for additions to the 1992 Directory

The 1992 Directory, published in February of that year, listed the names, addresses, telephone and fax numbers, and relevant interests of about 400 *Newsletter* recipients. Since then, the "waiting list" has grown to about 175 names and should reach or surpass 200 by the end of the summer. So, within a couple of months we plan to begin work on a supplement to the Directory which will include the new listings, also public and institutional libraries that receive the *Newsletter*, and, of course, corrections of entries in the original Directory.

Those listed in the original Directory will automatically receive a copy of the Supplement. Those listed in the Supplement will receive both the Supplement and the original Directory. Once the Supplement is out, we have no further plans for new directories or additional supplements. If you wish to be listed in the Supplement and have not already so indicated, fill out and return the Address Form on page 11, checking "yes" for Directory or let us know in some other manner that you wish to be listed.

The Buffalo Museum's Big Event Took a Hit, But Ultimately Triumphed Over the "Storm of the Century"

The Buffalo (New York) Museum of Science had put a lot of planning into the evening of Saturday, March 13th. The chief organizer was Wayne Gall, Associate Curator of Invertebrate Zoology. The evening would begin at 7:30 pm with a public lecture, "Insects: An Overlooked Food Resource," followed by the "Bug Appetit" reception. To cater the reception, the Museum had engaged Pears Pastries of Jamestown, New York.

Pearl's features chef Bill Warner who is famed throughout western New York for his specialty desserts and his creative puff pastry. Of the several puff pastry insects and arachnids created for the occasion, a praying mantis, standing about three feet high, was particularly impressive. The hors d'oeuvres and desserts included:

Mushrooms stuffed with mealworms and wild rice Chicken, green onion, and cricket springroll Julienned zucchini and waxworm fritter with dipping sauce Mealworm praline on pastry cream in puff pastry Cricket hazelnut torte with raspberry

Local television, radio and newspapers provided good advance publicity, including televised interviews with several of the major participants for Saturday night. Gerry Rising's column, "Nature Watch," in the *Buffalo News* was particularly insightful, citing examples of how our narrow attitudes about food in the U.S. often work to the detriment of other people. By the close of business on

Friday, ticket sales had passed the 300 mark. That was great, but all was not joy. It was becoming increasingly apparent that Saturday's event might be on a collision course with what was being heralded as the "storm of the century," slowly but inexorably moving up through the Atlantic Coast states.

Your editor, there to deliver the lecture (and, as usual, trusting in good luck), planned to sleep in a little on Saturday morning but was jolted awake at 7:00 am by the telephone ringing. It was Wayne Gall, who had a big decision to make. There were 300 ticket-holders for 7:30 that evening; Bill Warner, the chef, was poised in Jamestown ready to head toward Buffalo with all the vittles; I was scheduled on a flight out the next morning; and the storm, now a virtual certainty to engulf western New York, was expected to become very noticeable in Buffalo before nightfall.

To make a longer story short, everything was rescheduled for Tuesday, March 16th. Despite the confusion of a postponement, 225 people showed up. Following the lecture, they made short work of Bill Warner's tasty and attractive assortment of hors d'oeuvres and desserts. Add Bill Warner to the short but growing list of U.S. chefs who have successfully and creatively braved the frontiers of insect cuisine. And congratulations to Wayne Gall and the Buffalo Museum of Science for a highly successful fete in the face of great adversity.

Addendum: During my storm-lengthened seven days in Buffalo, Wayne G. introduced me to the "Original Buffalo Chicken Wings" for which the city is so justly famed. Talk about good! reminded me of baked cicada nymphs. I ate nothing but Chicken Wings the last three days.