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THE FOOD INSECTS NEWSLETTER

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Bakuti - A Nepalese Culinary Preparation of Giant Honey Bee Brood

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The best known edible honey bee product, and for European-derived cultures, perhaps the only known product, is that super-saturated solution of carbohydrates known as honey (wonderfully tasty, but woefully short as a meaningful addition to an already carbohydrate burdened North American-European diet). But for many Asian cultures honey is not the singular food item to be stolen from a bee colony. Honey bee brood, especially late instar larvae and pupae, is recognized for its nutritional and organoleptic qualities. Cadres of inappropriately termed "honey hunters" exist in many Asian and African societies (inappropriate because in addition to honey, these knowledgeable individuals are also "hunting" the wax and brood as utilizable commodities).

The following preparation of honey bee brood, based on a recipe from Nepal, is the insect dish with which I have had the greatest success in consumer acceptance (consumers being identified for the most part as the undergraduate and graduate students in two courses I teach that include entomophagy as an important, albeit small aspect of both classes). The recipe was given to me in 1986 by Benjamin Underwood, at that time an entomology graduate student at the Dyce Laboratory of Honey Bee Biology, Cornell University, who was just completing a MS degree concerned with the natural history of the giant honey bee of the Himalayan foothills, *Apis laboriosa* Smith. The Nepalese term for the preparation is bakuti, and (in Nepal) it requires late-instar larvae, prepupae and pupae of the high altitude giant honey bee *Apis laboriosa*. (For a pictorially dramatic account of the plundering of these cliff nesting colonies see *National Geographic*, Nov. 1985, "Honey Hunters of Nepal", Valli & Summers.)

The Nepalese preparation was of interest to me as I had several times witnessed and experienced giant honey bee brood (*Apis dorsata* F. as opposed to *A. laboriosa*) as a culinary item in northern Thailand where brood in the comb is wrapped in banana leaf and steamed. While tasty, it is not particularly stimulating from a visual sense, and the presence of wax required a fair amount of chewing (and spitting).

Bakuti is based on the extraction of the water soluble protein and liquid fats from whole larvae and pupae while still in the wax comb.

Sections of brood comb are placed in a woven, fabric bag and hand squeezed over an open container that collects the liquid phase. This liquid fraction is then heated and gently stirred which, after about 5 minutes, results in a product that closely resembles, in color and texture, soft scrambled eggs. The odor and flavor qualities of bakuti are difficult to assess or to associate with foods familiar to North American/European palates. From a very subjective personal perspective, I believe Ewell Gibbons would describe it as 'nut like.' It is my understanding that the Nepalese will add various available animal and vegetable materials to it.

Newsletter gets good review in
Whole Earth, see page 6.

As giant honey bees are not indigenous to North America, and as Ben Underwood so quickly realized, we can easily substitute brood from our familiar European honey bee, *Apis mellifera* L. Honey bee brood is readily available (especially for university apiculturists) during the active foraging season. I have found that brood in virgin comb is more easily extracted than that coming from older, darker combs. For the non-beekeepers interested in experimenting with bakuti, take the time to discover a local beekeeper who would be willing to sell a few frames of brood (the secondary benefit here is that you won't have to face the venomous defense put forth during the removal of brood combs from a colony). Whole brood combs are easily stored by freezing until ready for use.

To further the acceptance of "American style" bakuti, I have frequently added Philadelphia brand cream cheese in an amount equal in volume following the cooking of the liquid brood (an adulterant to the entomophage purist). This smooth, insectile pate is usually offered as a spread over a cracker. The more adventuresome members of my laboratory group have served this following departmental seminars, in private social functions, and in academic classroom settings. The overall acceptance rate (defined as those who will at least try it), is ca. 85%.

My thanks to Ben Underwood for first turning me on to the flavorful experience of well prepared honey bee brood.

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Insect Extravaganza at Iowa State University

The Insect Horror Film Festival which unfolded at Iowa State University on September 6-8 had more to offer than bug horror movies. A horror movie was indeed shown, as advertised, at 8:00 pm each evening. But the doors opened at 7:30 pm and those who were attracted by the prospect of seeing bug violence found that they had inadvertently exposed themselves to some additional education about insects. The Festival was sponsored by the Entomology Club, the Student Union Board and the ISU Committee on Lectures.

Before each film, at 7:30 p.m.:

--Praying Mantis Give-away to first 50 audience members.
--Insect Tasting Event including corn borer bread.
--Insect Petting Zoo with hissing cockroaches, drone bees, tarantula,

Among the recipes featured at the Insect Tasting Event:
Corn Borer Corn Bread: Use favorite corn bread recipe and substitute 1/2 cup ground dry roasted corn borer larvae for 1/2 cup corn meal. Any larvae without hairs or bright colors can be substituted for corn borer larvae.

Chocolate Covered Crickets: 2 squares of semi-sweet chocolate and 25 dry roasted crickets and/or grasshoppers with legs and wings plucked. Melt chocolate as directed on the box. Dip insects in chocolate, place on wax paper and refrigerate until party.

Insect preparation: To clean insects, place in a collander or fine mesh strainer, rinse and pat dry. Dry roast in a 200° oven, until crispy. They can then be ground into flour, cut into pieces

giant walking stick, giant water beetle and dragonfly nymph. --Concert of recorded insect mating calls. --Two short bug cartoons. --Introduction by Dr. John Obrycki of the ISU Entomology Department who discussed how insects are used to develop moods in films and also the accuracy of the portrayal of insects and scientists in film. (Dr. Obrycki teaches the course "Insects in Society" at ISU.)	or used whole.
At 12:00 noon on Thursday, September 6, in the Memorial Union there was a panel discussion by faculty in the Departments of Psychology, Food Technology, and Entomology on "Insects in Popular Culture." The Festival had excellent press coverage via Veronica Fowler of the Des Moines Register's Ames Bureau, including an article on the use and value of insects as food in other cultures around the world.	The entomology students serving the insects attempted to make them irresistible by displaying them on silver trays with white tablecloths and candlelight. Cynthia Lidtke, an entomology student helping with the festival, said she hopes moviegoers will come away a little more appreciative of insects. "I hope they won't just step on them any more, and say, "Well, there's another one." (We thank Dr. Jim Mertins for supplying information about the festival. See the July 1989 issue of the <i>Newsletter</i> for an article by Mertins, "Entomophagy in the Movies.")

EDITOR'S CORNER

The Editor will be retiring from the active faculty of the University of Wisconsin to emeritus professor status early in 1991. I decided that 40 years of medical entomology is probably enough, and not having had time to do a mid-life crisis, it seems time for at least a career change of sorts. This decision is intended to allow more time for exploring the past, present and future of insects as a food resource.

It does introduce problems, however. In phasing out my medical entomology research program which dealt mainly with mosquito borne arboviruses, the staff people who helped with the mechanics of producing the *Newsletter* are being lost. The Department of Entomology has also helped subsidize the *Newsletter* by providing the clerical assistance and postage needed for handling between-

issues correspondence generated by the *Newsletter* and other matters pertaining to insects as food. With the steadily increasing volume of such correspondence it is understandable that the Department has been hinting recently that this cannot go on forever.

Despite the reduced level of subsidization, we still have some volunteer help from Catherine Howley (a Milwaukee pharmacist) and Dr. Chris Merritt (both formerly in the medical entomology program) and increasing support from our Sustaining Patrons (those who now and then generously contribute \$5.00 or more toward meeting *Newsletter* costs). Also, we are starting to look for sponsors who might be interested in contributing somewhat larger amounts in support of the *Newsletter* and associated activities. So, we do plan to proceed with Volume IV, and in Number I expect to include an article on the nicely polyunsaturated nature of insect fatty acids. GRD

When Chicago Braced for the Onslaught of the 17-year Cicada

Everyone agreed (well, *almost* everyone) one option was to eat them!!

About the middle of May, the editor was interviewed at length (four times) by feature writer Larry Weintraub of the *Chicago Sun-Times* for a lengthy article called "Food for Thought" which was to appear in the Sunday, May 27th edition of the *Sun-Times*. The article was about the use of insects as food around the world, and it was to serve as sort of a centerpiece for two shorter articles by Weintraub. It soon became apparent that all of this was part of a massive effort to prepare Chicagoans for the impending appearance of the 17-year cicada.

One of Weintraub's articles provided information on the life-cycle of the cicada and announced the existence of the CICADA HOTLINE which would be logging calls 24 hours a day. The second article began: "Millions of tasty, entrees-if-you-dare will be available for the gathering during the next month in northern Illinois, and some Chicagoans will want to know how cicada fanciers prepare them." It provided some recipes (see insert). The article recalled that Peter Kranz, a paleontologist and Washington, D.C., schoolteacher, served cicadas to hundreds of his students in the nation's capital three years ago when the noisy insects emerged there. "Most kids say they taste like french fries, popcorn and chicken," reported Kranz, who covered sauteed cicadas with cinnamon for breakfast and garlic and butter for snacks. Weintraub also quoted University of Chicago ecology professor Monte Lloyd that raw cicadas are of excellent flavor, tasting like raw potatoes sprinkled with avocado or clam.

A few pages away in the *Sun-Times* was another article entitled, "Spray's no way to greet cicadas," by Scott Fomek. Fomek had marshalled a bevy of experts, mostly entomologists from the Field Museum and the University of Illinois Cooperative Extension, whose advice, in summary, was relax and don't spray. "As soon as you mention spraying, people will be out there with flame throwers and bazookas," said Daniel Summers at the Field Museum, who added that

gauzelike fabric that lets in air and light (don't use plastic) and tie it below the first branches. This will prevent egg-laying.

Apparently, however, not everybody in Chicagoland was as cool and reasoned as the writers and experts we've cited above. The May 30th *Wisconsin State Journal* (Madison newspaper) front-paged a story, date-lined Chicago: "This city is going bonkers over bugs. There are nightly updates on the TV news, recipes in the newspaper, even a special hotline heralding not the coming of the apocalypse, but the emergence of inch-long critters called cicadas The noisy devils unearth themselves every 17 years to mate, shriek incessantly,

Here are a few recipes from cicada gourmets:

- 1) Marinate cicadas in Worcestershire sauce at least one hour. Dip in egg, then in flour or breadcrumbs. Deep-fry and serve with soy or cocktail sauce.
- 2) Place cicadas on cookie sheet and roast for 10 to 15 minutes at 225 degrees. When dry grind coarsely and use as nut substitute in bread or on ice cream. A finer grind can be mixed 50:50 with flour to make a high-protein dough.
- 3) Drop cicadas briefly in boiling water. Coat with red pepper, garlic and ground bay leaf.
- 4) Stir-fry with garlic, ginger and bite-sized vegetables.

Newly hatched cicadas, called *tenerals*, are considered best for eating because their shells have not hardened. After that happens, the wings and legs should be removed before cooking.
Larry Weintraub

Chicago Sun-Times

and drive homeowners crazy... The cicadas have reached Elmhurst', a broadcaster announced in a teaser for a recent

people who spray are bigger pests than the noisy cicadas. Since so many other animals--birds, racoons, and even people--eat cicadas, spraying contaminates a food source, Summers said. Adverse effects on beneficial insects were also mentioned. Recognizing that egg-laying, in which incisions are made in twigs, can do damage to young deciduous trees, the Chicago experts nevertheless played it cool. "Frankly, we at the Botanic Garden don't think it is anything to worry about," said Meegan McCarthy-Bilow, horticulturist at the Chicago Botanic Garden. "For the larger trees it's been described as just a natural pruning," said John Wagner, Field museum biologist "Just sit back and enjoy one of the most spectacular events the animal kingdom has to offer," said Phil Parrillo, a Field Museum entomologist. The consensus advice was that if you have a particularly valuable young tree, with trunk less than 1 1/2 inches across, wrap the top with cheese cloth or some other	television newscast The orgy should be over by early July, and experts say the creatures are harmless. But that hasn't calmed the hysteria." By now, one of the resident Chicago experts cited above was showing signs of exasperation. "It's completely unfounded," said entomologist Parrillo. "People are going out and getting insecticide to spray on them, but they're only going to be here for a few weeks. Gee whiz, don't worry about it." Parrillo was blaming the news media for helping create "cicada mania." <i>Time</i> magazine (June 4, page 57) also got into the act with a short article headed "First Crunch, Then Munch." It warned of "zillions" of "five-eyed, frail-winged critters, shedding their skins, singing like drunken maniacs, and mating with an abandon that renders the word orgy insufficient As the city waited for the bugs to buzz forth last week, the insects became the talk of the town." Then, <i>Time</i> SEE CICADAS, p. 5
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Letters

Insect consumption in Nigeria

Dr. Matt Ivbijaro, Associate Professor of Entomology at the University of Ibadan, and Chairman of the Ibadan branch of the Entomology Society of Nigeria, writes in part:

"I am delighted that information is now being gathered on food insects which, in Nigeria, are important sources of high food protein to rural dwellers and a growing delicacy to many city dwellers."

Insect consumption in Zambia

In response to a letter from the editor, Dr. Shubh K. Kumar of the International Food Policy Research Institute, Washington, D.C., wrote in part:

"Thank you for your recent letter regarding the work we are doing on food consumption patterns in Zambia. We have found very common use of foods such as caterpillars and flying termites in the diet of rural and peri-rural households. The former is much more common and is even widely available in dried form in local markets. The latter is much more a rarity, and is seasonally available only during the early part of the rainy season. However, both items have a seasonal pattern in their consumption. Even though we did not find the dietary use of other insects in the region of Zambia where we were working, it has also been reported that grasshoppers and crickets are occasionally eaten. The Zambian food composition tables [which are widely used by nutritionists in the country] include these items among the list of food items consumed and show their nutrient content....

"Overall, there seems to be a trend towards a reduction in the consumption of these foods. We have made an assessment of the contribution of these foods in the diet, and have found it to be very small on an annual basis. However, it is very significant on a seasonal basis, and the time these foods are widely available is during the hungry season, and at that time provide an important source of quality protein in the diet."

To taste a bee

Dr. Justin Schmidt of the USDA's Carl Hayden Bee Research Center in Tucson, Arizona, obviously believes that science can be fun and entertaining as well as informative. As part of some other correspondence with the editor, he wrote:

"For amusement I decided to tackle the question of palatability of bees. Adults are rarely eaten. Thus two hypotheses: 1) the sting deters (too spicy of fare), 2) they taste bad. I believed it is impossible to entirely separate the two hypotheses, but I did do some taste tests to at least address hypothesis (2). Workers and drones were frozen for 10 minutes, then parts eaten (by

Abdomens tasted a bit like pungent aromatic curry spices with the added benefit of being slightly bitter and hydrolytic. Drones were great. Worker abdomens minus the sting apparatus were more or less ok, but did have a slightly noisome texture. Whole workers have the combined flavors mentioned above and would hardly be classified as savory.

"I believe we can understand the result above by thinking of chemical ecology. Drones have no known or meaningful pheromones or chemical defenses - hence they would be expected to be tasty. Worker heads are loaded with 2-heptanone, which is theoretically a pheromone, but which probably functions better as an allomone. It smells bad and undoubtedly imparts the paint thinner taste. Thoraces have nothing, and hence are tasty. Abdomens have both the bouquet blend of esters that is the alarm pheromone and the venom. The pheromone probably provides the "pungent" or "currylike" flavor. The venom is both alkaline and lytic - hence the bitterness and hydrolytic nature. My feeling is that workers are not eaten by many vertebrate predators, not only because of the sting, but also because they taste so nasty."

Pass the Chitin, Please

Some day as you stroll down your local supermarket aisle you may spot a new breakfast cereal brightly labeled Chitin Enriched! "Now, where have I heard about this stuff?" you may ask yourself. Well, if you've been keeping up with your military hardware magazines you might have come across references to it in an article about deep penetration sonar, or if you subscribe to health or medical publications it may have been featured in an issue on new medications for treating burn victims.

Chitin, a chemical derived from the shells of lobsters, crabs, and crayfish (and potentially from insects) has been approved for use in cereals by the Japanese as a source of fiber and calcium. And, in combination with other chemicals, chitin derivatives turn into gels that can be used in sonar equipment to send signals farther.

But, chitin's uses don't stop there. When sprayed on apples, for example, it keeps them firm, tart, and juicy for more than eight months in cold storage, and when applied to burns promotes healing and stops the itching. And, if you mix it with whey, it makes a nutritious animal feed that produces leaner, meatier, tastier chickens. Most animals can't break down the lactose that comprises 70% of this cheese byproduct, but chitin encourages the growth of bacteria in their digestive tracts which, in turn, produce enzymes enabling lactose to be metabolized. And if that isn't enough, chitosan, another chitin derivative, keeps the body from absorbing fat and cholesterol.

(From *Chemical Engineering Progress*, Vol. 85, No. 1, p 10, January 1989. Thanks to Dr. Jim Davis, UW Department of Forestry, for bringing this article to our attention. See the November, 1989, *Newsletter* for more on chitin and chitosan.)

this investigator, n = 1 sampler). Worker thoraces tasted fine, albeit a bit crunchy due to the wings, legs and other roughage. Heads tasted somewhat like paint thinner.

Collecting Ant Pupae for Food

I've been fascinated with social insects since my early childhood. I have watched ants in their natural habitat and constructed artificial nests to observe them in the fall and winter. This experience was influential in my future career choices. I received a Ph.D. in entomology from the University of Wisconsin in 1989 and will soon be moving to Louisiana State University to be their resident urban entomologist. Dr. DeFoliart asked if I would relate some of my knowledge on collecting ant pupae for the readers of this newsletter.

I'll deal only with the mound-building ant species in the genus *Formica*, since this ant group I know best. *Formica* is known for its spraying of formic acid as a defense mechanism. The large gland reserve appropriated for this purpose makes eating adults a distasteful experience. Even an ant with a full load of sweet honeydew in its crop tastes extremely acidic. The pupae on the other hand, do not have this acid flavor and are, if I must admit it, quite tasty.

Having dug into so many mounds to document the colony cycle of *Formica*, I learned that the brood cycle is very predictable for a given species in any one region. Regular checking of a single mound will

quickly reveal when the pupae can be harvested from all the mounds. Ant workers take meticulous care of their young. The smallest larvae are kept in moist areas of the mound. The pupae however need dry and warm conditions and are kept separate from the rest of the brood. The mound-builders make it particularly easy for pupae collection because the workers move them to the highest reaches of the mound where the sun can warm them. *Formica* adults will even remove the paper-like cocoon from the pupae several weeks before they have sclerotized, sort of like shelling peanuts.

The best time to go pupae collecting is one hour after the sun has hit the mound in the morning. The pupae can be collected just under the surface of the mound at this time. Later in the day the pupae will be moved deeper into the mound to avoid excessive heat. After collecting the pupae, replace the soil and thatch to its original place. By collecting in this way the colony itself will be little affected by the harvest and will quickly rebound from the loss. This is particularly important since ants (especially *Formica*) are one of our most beneficial insects in the world and must be respected as such.

Gregg Henderson

Recent Technical Papers

Glofcheskie, B.D.; Surgeoner, G.A. 1990. Muscovy ducks as an adjunct for the control of the house fly (Diptera: Muscidae). *J. Econ. Entomol.* 83:788-91. Department of Environmental Biology, University of Guelph, Guelph, Ontario N1G 2W1 Canada.

Authors' Abstract. In laboratory trials, Muscovy ducks, *Cairina moschata* L., removed adult house flies, *Musca domestica*, L., at least 30 times faster than commercial bait cards, coiled fly paper rolls, fly sheets, or fly traps. The LT₅₀ for ducks in 0.24 m³ cages with 100 flies was 0.6 h compared to 15.3 h for the most effective commercial device. Ducks survived for at least 12 wk in pens with calves, without injury or feed supplement. Ducks ingested a mean of 25 house flies per 15-min observation period when populations were low to moderate. The economics and advantages of Muscovy ducks as part of a management program for house fly control are discussed.

The authors suggest that the observed behavior is innate as the experimental ducks had apparently had no previous experience with flies, yet fed on them readily even when provided feed *ad lib*. One of the ducks penned with a calf was observed to capture, on average, a mean of 23 flies per 32.5 attempts. Two (among several) advantages of the ducks were effectiveness against insecticide resistant flies and elimination of breeding sites by removing spilled feed. The ducks were also more economical than the commercial control devices. The authors estimate that under their local conditions a producer could make a profit of \$65 on 10 ducks by selling them at the end of the season, while the other control

devices range in cost from \$171 to \$455 for season-long fly removal. At a midsize dairy farm that kept unrestrained Muscovy ducks for fly control, the ducks stayed in the vicinity of the barn and interacted well with animals and humans. In addition to feeding on adult house flies, they also picked flies from the lower legs of cows, indicating that they were also feeding on stable flies, *Stomoxys calcitrans* s (L.). It should be noted that ducks cannot be used in commercial poultry operations because of disease hazards.

(For more on domestic animals as biocontrol agents, see *Newsletter* Vol. II, Number 2.)

CICADAS (from page 3)

provided its own recipe: dip cicadas in batter and fry until golden brown. Serve with cocktail sauce or sour cream, or use as a pizza topping.

The plethora of recipes that appeared indicates that, for some reason, Americans consider cicadas, unlike most insects, as almost respectable food. Maybe, some day, a predicted periodical cicada emergence will automatically call for a community festival. The cicadas would provide not only the food, but also the music. The 1990 emergence extended (but barely) into southern Wisconsin, and one of our students, John Snell, harvested part of the crop at Lake Geneva. Roasted, the flavor was "meaty" and delicious. Surprisingly, with the tenebrals (newly emerged from the soil) it really did prove to be unnecessary to remove the wings and legs. The next issue of the *Newsletter* will contain a short article on the identity, distribution, and predictability of cicada emergences in North America.

GRD

Publication Announcement

Ethnobiology: Implications and Applications
Proceedings of the First International Congress of Ethnobiology (Belem, Brazil 1988)

The two-volume set, with more than 500 pages, is divided into six sections: Part A. Ethnobiology in Theory and Practice; Part B. Ethnozoology; Part C. Botanical Resources; Part D. Natural Resource Management; Part E. Ethnopharmacology; and Part F. Ethnomedicine and Popular Curing.

Part B, Ethnozoology, includes the following papers:

5. Social Wasps Among the Bribri of Costa Rica by Christopher K. Starr (Department of Horticulture, University of Georgia, Athens, GA, USA) and Maria Eugenia Bozzoli de Wille (Universidad de Costa Rica, San Jose, Costa Rica)

6. Insect Resources and Plio-Pleistocene Hominid Evolution by Mark Q Sutton (Department of Sociology and Anthropology, California State University, 9001 Stockdale Highway, Bakersfield, CA, USA)

7. Aboriginal Tasmanian Entomophagy by Mark Q Sutton
8. The Use of *Azteca* Ants for Biocontrol of Insect Crop Pests among the Kayapo Indians of Central Brazil by William L. Overal and Darrell A. Posey (Museu Paraense Emilio Goeldi,

Introduction to Ethnozoology by William L. Overall 1. The Ecology and Management of Insect Pests in Traditional Agroecosystems by Miguel A. Altieri (Division of Biological Control, University of California, Berkeley, CA, USA) 2. Insects as Food in Indigenous Populations by Gene R. DeFoliart (Department of Entomology, University of Wisconsin, Madison, WI, USA) 3. Edible Insects: Barbarism or Solution to the Hunger Problem? by Julieta Ramos-Elorduy Instituto de Biología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, 04510 México, D.F., México) 4. The Significance of Scarab Beetles in the Ethnoentomology of Non-Industrial, Indigenous, Peoples by Brett C. Ratcliffe (University of Nebraska Museum, W 436 Nebraska Hall, Lincoln, NB, USA)	Belem, Para, Brazil) To order, send check in US funds (US \$45.00 postpaid) to: Museu Paraense Emilio Goeldi, Editorial Department/Attn: Dr. William Overal, P.O. Box 399, Belem, Para, Brazil. Add US \$28.00 for airmail. (See the November 1988 Newsletter for more on the First International Congress of Ethnobiology.) Congratulations to Gerardo Larde (El Salvador), one of the 1990 Rolex "Spirit of Enterprise" Award winners, for his article "Insect larvae for animal feed and organic waste treatment."
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From the Whole Earth Review

The widely-known <i>Whole Earth Review</i> (published quarterly) and <i>Whole Earth Catalog</i> are published by Point, a non-profit corporation with editorial offices in Sausalito, California. Review Issue # 68, published in September, carried the following on page 42:	
In almost every culture on the planet, insects are regarded as a delicious part of the diet. Not only do they provide essential nutrition to humans foraging in marginal environments, but certain species are sought-after gourmet items that demand top dollar in Oriental markets and upper-crust Mexico City restaurants. Among the few exceptions to this wide-spread entomophagy (eating of insects) are the European-derived cultures, which are increasingly imposing their misplaced squeamishness upon indigenous peoples - and malnutrition is the unfortunate result. As one Mexican agronomist observed, "More Mexicans would be eating bugs were it not for decades of ad campaigns by international companies pushing white bread and Spam." The Food Insects Newsletter, originating at the Department of Entomology of the University of Wisconsin at Madison, is an effort to reverse this trend. News items, short articles, and book reviews	advocate the use of insects as food for both humans and livestock. Doesn't it make more sense, for example, to eat locusts (as generations of Africans and Native Americans have done) than to dump tons of pesticides on them? (And from all reports, they are quite tasty, similar to fried shrimp.) In fact, pound for pound, insect pests are often more nutritious than the crops they eat! Though the authors are quite serious about their subject, the tone of The Food Insects Newsletter is friendly and informal. And there are frequent excursions into the light-hearted, as in the article "Entomophagy in the Movies" and in numerous recipes for such neglected delicacies as mealworm quiche, grasshopper fritters, and rice with cooked wasps. Ted Schultz The above was followed by excerpts from several issues of the <i>Newsletter</i>.

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Tentative Venture into Buying, Selling, Exchanging From correspondence and other feedback, it is evident that the <i>Newsletter</i> and related materials from the FIRDP (Food Insects Research and Development Project) are used by many readers as a source for introducing or strengthening presentations in their biology courses on the use and concept of insects as food. This is happening not only in university courses, but also at the elementary, middle and high school levels. The editor teaches a 1 -credit course here at the University of Wisconsin on the human use of insects as food/animal feed, and the course is spiced-up considerably by having available (thanks to the generosity of a number of people in Africa, Asia and Mexico) some good examples in the form of dried or alcohol-preserved specimens, color slides and prints. Although the variety of samples accumulated so far is small compared to the great variety of species consumed, these visual aids elicit great interest from students. It seems that the newsletter might perform a valuable service by offering to serve as a means of contact for those wishing to buy, sell or exchange materials that would be useful as teaching aids. Needless to say, 99% of the pertinent species (and especially the appropriate life stages) are not yet stocked by the biological supply houses, so there is no commercial source. For those of you who might wish to advertise your needs or offers in the <i>Newsletter</i>, remember that space is at a premium. So please keep them brief.	**How to read your address label ** Organizations with paid subscriptions have an easy mechanism for keeping their mailing lists efficient No check, no subscription, and no wasted postage. As the <i>Newsletter</i> is free, and goes to a diverse group of scientists, non-scientists, educators and others, we have more of a problem knowing who, among those who have requested a copy of the <i>Newsletter</i>, wish to continue receiving it once they've seen it. Thus, we've asked that those who wish to stay on the mailing list should, once only, complete and return the Address Form which is found on the inside back page of each issue. We have devised a code system that will let you know your mailing list status. An "M" beside your name on the mailing label means that you are temporarily on the mailing list but will be dropped unless a completed Address Form is received. A "CM" means that we have received a completed Address Form and you are confirmed on the mailing list but do not wish to be included in the directory. A "D" beside your name means that we have an Address Form from you in which you checked "Yes" for Directory listing (yes, despite innumerable delays, we still plan to publish the Directory), and you are also on the confirmed mailing list.
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