

Welcome to Zack's Bug-Feasting Page

All pictures copy-righted by Bees Net, for publication please contact [Zach](#)

186950 served since 3-14-1997, web launched April, 1995. For honey bee pictures, please go to [Zach's bee photos](#).

Coming up soon: many more pictures!

1. eating insects in Thailand's street market
2. eating French-style insect feast in the Montreal Insectarium

Web honors

- 12/26/1999 to 1/2/2000, Site of the Week, www.zenzibar.com
- 1998: Web Weirdness Official Weird Site, www.randysweb.com
- 1998: Site of the Week, www.wackystuff.com

Eating Giant Silkworms (Lepidoptera: Saturniidae)



Being cooked



On the Table



Being consumed



real silkworms

Eating Mealworms (Cleopectera: Tenebrionidae: Tribolium spp)



Rearing



Cooking



Ready to serve



Not sure edible



Yuck!



**Look, I'm
brave!**



**Me eat
worms too!**



Sweet worms



No big deal



**Better than
French
Fries!**

Eating Hornets (Hymenoptera: Vespidae)



harvesting



nest



harvested



cooked



first bite



meditation

Eating Predaceous Diving Beetles (Cleoptera: Dytiscidae)



In water



Being netted



On the plate



Wings off



Not bad



Really?

Eating Caterpillars (Lepidoptera: Pyralidae?)



**cooked
caterpillars**



testing



enjoying



devouring

Eating Scorpions (Arachnida: Scorpiones)



live & deadly



dead & tasty



kissing



eating



first bite

Eating Other Insects



yummy bees!



grasshoppers

Other bugs that I have tried: canned ants from Japan, not so good (too much soysauce?); live honey bee queen larvae from queen cups, a by-product of royal jelly production; frozen drone pupae (white eye stage); a few ant larvae; meal worms either in a pie or fried -- crunchy and better than french fries! More pictures to come!

Links to other insect-eating pages

- [The Food Insects Newsletter](#)
- [Insects as Food](#)
- [Insect Snacks from Around the World](#)
- [Insects in the Human Diet](#)
- [Tasty Insect Recipes](#)
- The bug-eating domain: eatbug.com

● Other pages maintained by Zachary Huang:

www.cyberbee.net Pretty pictures of bees and everything you need to know about bees and beekeeping!

sfi.cyberbee.net The social insect modelling group meets in Sante Fe each year in October

bees.msu.edu The official Bee Lab page at Michigan State University

[Departmental Profile at Michigan State University](#)

Search:

9 albums, 734 photos

[\[login\]](#)

▶ 1 ◀



[Anatomy & Morphology](#)

Form and function of the honey bees.

Last changed on Aug 13, 2003.
This album contains 4 items.

This album has been viewed 2354 times since May 31, 2003.

Sub-albums:

[Head \(1573 hits\)](#)

[Thorax \(746 hits\)](#)

[Abdomen \(943 hits\)](#)

[Sting-related \(1159 hits\)](#)



[Bees on Flowers](#)

Bees forage for nectar and pollen on flowers.

Last changed on Jun 01, 2003.
This album contains 11 items.

This album has been viewed 3161 times since May 17, 2003.

Sub-albums:

[Bees Foraging \(3356 hits\)](#)

[Bees on Roses \(749 hits\)](#)

[Bees on Peonies \(662 hits\)](#)

[Asian Bees \(*A. cerana*\) \(1226 hits\)](#)

[Giant Bees \(*A. dorsata*\) \(1873 hits\)](#)

[Dwarf Bees \(599 hits\)](#)

[Stingless Bees \(631 hits\)](#)

[Bumble Bees \(2191 hits\)](#)

[Wasps + bees \(5022 hits\)](#)

[Bee-like Flies \(687 hits\)](#)

[Flowers Without Bees \(730 hits\)](#)

[Bees Near Entrance](#)

Bees in the air or near the entrance.



Last changed on Dec 08, 2003.
This album contains 15 items.

This album has been viewed
2257 times since May 17,
2003.

[Bees @ Home](#)

Bees inside the nest.



Last changed on Jul 26, 2003.
This album contains 5 items.

This album has been viewed
1657 times since May 17,
2003.

[Disease & Pests](#)

Disease and pests of honey
bees, mainly Apis mellifera.

Last changed on Nov 06, 2003.
This album contains 12 items.



This album has been viewed
2136 times since May 16,
2003.

Sub-albums:

[European Bees \(1783 hits\)](#)

[Asian Bees \(1053 hits\)](#)

[Giant Bees \(1552 hits\)](#)

[Dwarf Bees \(966 hits\)](#)

[Wasps and others \(2095 hits\)](#)

Sub-albums:

[Brood patterns \(267 hits\)](#)

[Varroa mites \(578 hits\)](#)

[American Foulbrood \(246 hits\)](#)

[European Foulbrood \(155 hits\)](#)

[Nosema disease \(198 hits\)](#)

[Chalkbrood disease \(139 hits\)](#)

[Wax Moths \(204 hits\)](#)

[Tracheal mites \(182 hits\)](#)

[Sacbrood disease \(123 hits\)](#)

[Laying workers \(149 hits\)](#)

[Other pests \(117 hits\)](#)

[Small hive beetle \(131 hits\)](#)

[Beekeeping](#)

Beekeeping related photos

Last changed on Nov 01, 2003.
This album contains 11 items.



This album has been viewed
1728 times since May 23,
2003.

Sub-albums:

[Apiary Scenes \(1130 hits\)](#)

[Beekeeping Equipment \(1330 hits\)](#)

[Package installation \(671 hits\)](#)

[Swarm-Catching \(Easy\) \(887 hits\)](#)

[Swarm-Catching \(Hard\) \(738 hits\)](#)

[Swarm-Catching \(Impossible\) \(504 hits\)](#)

[Bee Removal \(2281 hits\)](#)

[Honey Harvest \(715 hits\)](#)

[Observation Hive \(892 hits\)](#)

[Moving Bees \(564 hits\)](#)

[Queen Cells + Royal Jelly \(937 hits\)](#)

[Honey for Sale](#)

Honey for sale



Last changed on Oct 14, 2003.
This album contains 28 items.

This album has been viewed
1508 times since May 27,
2003.

Sub-albums:

[Bug me not! \(694 hits\)](#)

[Bugs on flowers. \(244 hits\)](#)

[Bugs at other places. \(370 hits\)](#)

[Non-bees](#)

Photos of insects that are not
bees or wasps.



Last changed on Aug 12, 2003.
This album contains 3 items.

This album has been viewed
940 times since Jul 29, 2003.

[Bee research](#)

Photos related to research methods, procedures or scientists.



Last changed on Feb 03, 2004.
This album contains 6 items.

This album has been viewed
703 times since Jul 29, 2003.

Sub-albums:

[The Academics. \(694 hits\)](#)

[The Keepers. \(273 hits\)](#)

[This Webmaster's Bee Lab. \(288 hits\)](#)

[Protocol: Mite Experiment. \(270 hits\)](#)

[Protocol: Bee Bleeding \(433 hits\)](#)

[Protocol: juvenile hormone measurement. \(302 hits\)](#)



Buzzlink.com

Rate, Date, Communicate ;)



BuzzMail^U:
Log In

P:

[My Profile/Messages](#) | [Rating/Dating](#) | [Free Web Space](#) / [Log In](#) | [Free Email](#) [Check My Mail](#)



Create a buzz with Buzzlink's Rate & Date

thousands of hot singles are waiting

get hooked up today...

[Sign up now](#)

More ways to create a buzz...

Get a Free Buzzlink Email Account - I Want:

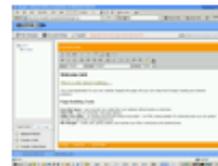
@buzzlink.com



Free Picture Rating
Meet Hot Singles Now



Free Email Service
Get you@buzzlink.com



Free Web Hosting
buzzlink.com/yoursite

[Advertising](#) - [Info](#) - [Add To Favs](#) - [Make Buzzlink Your Home Page](#)

Copyright © 2003 Buzzlink - All rights reserved.



Giant silk worm pupae were fried in vegetable oil, no spices (not even salt!) were used, as the pupae themselves are tasting pretty good. The hand belongs to my mother-in-law, who is an excellent cook.

Time of photo: November 1993. Place: Yilan city, Heilongjiang Province, Chi na. Copyrighted © by Bees.Net

[Home](#)



Cooked giant silk worm pupae, together with 4 other dishes on the table. Upper left corner: fiddleheads -- young leaves from fern. Lower left: raw onion, which was used to eat with the lamb meat on the upper right corner in a hot pot. Lower right: lamb meat already stir fried.

Time: November 1993. Place: Yilan, Heilongjiang, China. Copyright© Bees Net.



Zachary enjoying bugs as a real dish (as opposed to purely for entertaining others) for the first time. It tasted pretty good. You have to remove the midgut which is the only recognizable organ in the whole pupa. I suspect that the pupae were in a diapause stage, therefore all the rest of the adult tissue was not formed yet. The texture was sponge-like. Slightly salty. Lots of fat. Presumably very nutritious.

Time of photo: November 1993. Place: Yilan City, Heilongjiang Province, China. Copyrighted © by Bees.Net

[Home](#)



The true silkworm, *Bombyx mori*. This insect has been and is still mass reared on malberry leaves and produces silk for us. Also widely used as a model insect for studying insect physiology. This picture was taken in a Guangzhou restaurant. This is the only insect that I have seen available and did not taste yet (give me a chance to go back next time!). The price was marked as 23 yen per 0.5 kilogram, so basically \$3/lb. The lowest priced insect I know, perhaps due to that fact that it is a by-product of silk production.

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)







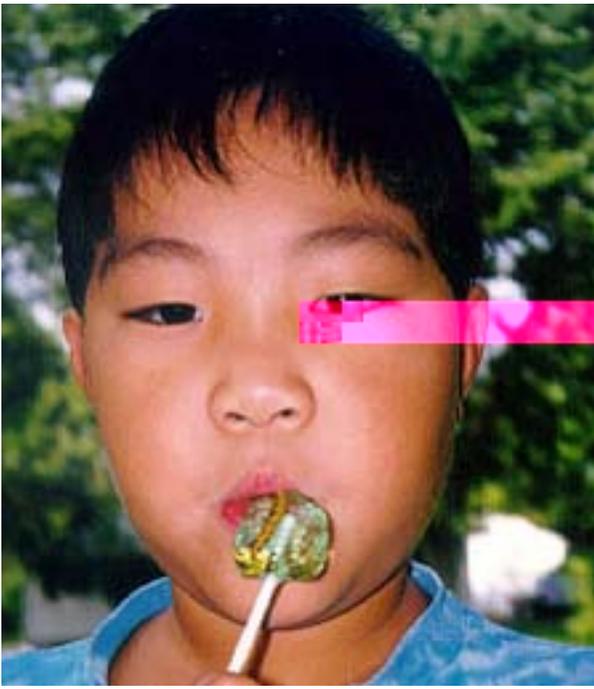
















A young man harvesting the mature larvae and newly formed pupae of a giant hornet in a restaurant. I noticed that there were actually two species there, one much larger than the other. The sign says "Wild wasp pupae, good for either men or women. Cooked either with pepper, wine, or eggs. Priced at 12 yen per 100 grams".

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



A close-up of the hornet's nest. Some wasps were emerging already, and those were not used for food.

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



A close-up of the harvested hornets in a bowl. Most were mature larvae, a few were already in the pupal stage, those can be differentiated by checking whether or not having legs.

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.
Copyrighted © by Bees.Net

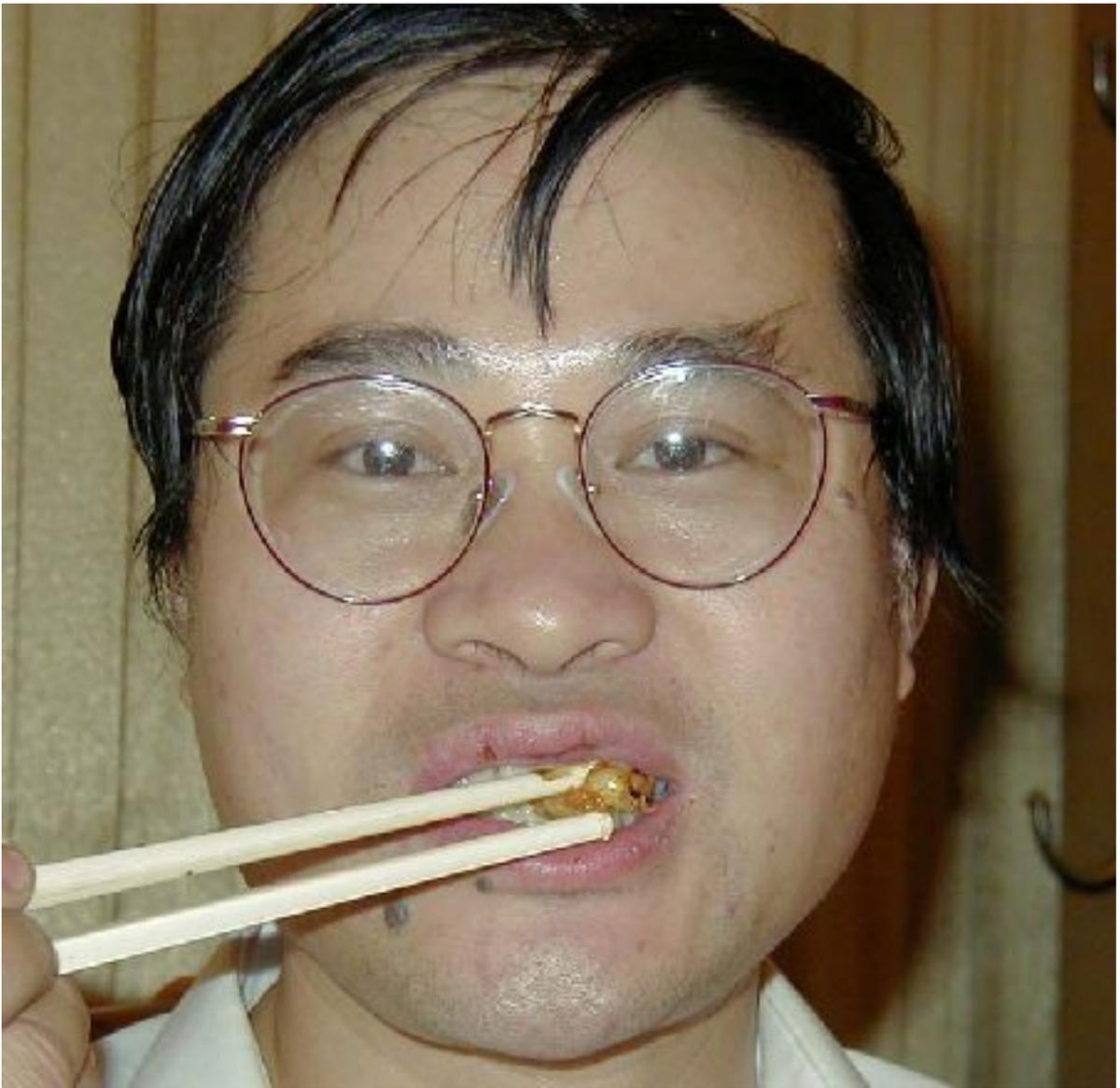
[Home](#)



Cooked hornets on a plate. This one seems to contain a higher proportion of pupae compared to the last picture.

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



Myself enjoying a pupa of the giant hornets. The bugs were fried not too crisp, but rather soft still.

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.

Copyrighted © by Bees.Net

[Home](#)



Prof. Beicheng Xia seems to be in deep thought before eating the hornet. This one appears to be a larva. Prof. Xia works in the Zhongshan University in Guangzhou. We were in the same department and specialty when we went to college. He was the host of this banquet to welcome my arriving at Guangzhou.

Time of photo: November 5, 1999. Place: Guangzhou city, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



Two species of the predaceous diving beetle (Dytiscidae) in pans in the Restaurant that I visited on 12/27/1999. The one on right has a price of 10 yen per 100 gram, which is equivalent to about \$6 per pound. I suspect that the beetles were artificially reared, since there were so many of them, but this was just my guessing.

Time of photo: December 1999. Place: Guangzhou city, Guangdong Province, China. Copyrighted © by Bees.Net

[Home](#)



The cook catching the predaceous diving beetles using a net. The ones that we ate were called "golden rimmed predaceous diving beetles" because of their yellow rims around the elytra and pronotum.

Time of photo: December 1999. Place: Guangzhou city, Guangdong Province, China. Copyrighted © by Bees.Net

[Home](#)



The predaceous diving beetle, cooked and on a plate. Looks like 2 dozens of them. The decorations on the rim of the plate were carrots and cucumber.

Time of photo: December 1999. Place: Guangzhou city, Guangdong Province, China. Copyrighted © by Bees.Net

[Home](#)



To eat the predaceous diving beetle, it is recommended to remove the elytra (hardened front wings) first, since they were like bones.

Time of photo: December 1999. Place: Guangzhou city, Guangdong Province, China. Copyrighted © by Bees.Net

[Home](#)



The predaceous diving beetle now becomes the prey of myself.

Time of photo: December 1999. Place: Guangzhou city, Guangdong Province, China. Copyrighted © by Bees.Net

[Home](#)



Jenny, who was 14 at the time, ready to prey on the predaceous diving beetle.

Time of photo: December 1999. Place: Guangzhou city, Guangdong Province, China. Copyrighted © by Bees.Net

[Home](#)



A dish of cooked caterpillars. I was told that these were obtained from inside the bamboo segments. An experienced "bug farmer" can determine which segment of bamboo have these critters by knocking and hearing the sound. Often hundreds of caterpillars are harvested from a single segment. I was told the adults were beetles, but I thought they were more like caterpillars (larvae of the order Lepidoptera). The specimens are not being determined for family by a taxonomist at the Michigan State University. This was served in the banquet to say farewell to me after a month's cooperative research on honey bees.

Time of photo: December 3, 1999. Place: Kunming city, Yunnan Province, China. Copyrighted © by Bees.Net

[Home](#)



Myself testing the taste of the cooked caterpillars. Difficult to describe, but in general most fried insects taste more like crunchy french fries with some faint taste specifically related to a particular insect.

Time of photo: December 3, 1999. Place: Kunming city, Yunnan Province, China. Copyrighted © by Bees.Net

[Home](#)



Prof. Shaoyu He enjoying the taste of the caterpillars. Prof. He was the host of the banquet. He works in the Eastern Bee Institute in Yunnan Agricultural University and teaches honey bee genetics and breeding.

Time of photo: December 3, 1999. Place: Kunming city, Yunnan Province, China. Copyrighted © by Bees.Net

[Home](#)



Prof. Haiou Kuang ready to eat half of the plate. He is an assistant professor in the Eastern Bee Institute of Yunnan Agricultural University.

Time of photo: December 3, 1999. Place: Kunming city, Yunnan Province, China. Copyrighted © by Bees.Net

[Home](#)



Live scorpions being held in a pan. Scorpions are not really insects, but they are arthropods (Arthropoda) like insects. They are more related to spiders and mites, being in the same class Archnida.

Time of photo: November 5, 1999. Place: Guangzhou City, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



A dozen cooked scorpions being set in a beautiful plate decorated with an orchid flower. Cooking probably denatures the potent poison the gland contains, since most venom are proteins that bind to neurotransmitter receptors.

Time of photo: November 5, 1999. Place: Guangzhou City, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



I did not want to miss the photo opportunity before I ate this pretty creature :)

Time of photo: November 5, 1999. Place: Guangzhou City, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



Mr. Zhang eating one scorpion. Mr. Zhang is the brother-in-law of Prof. Xia, shown elsewhere eating other insects.

Time of photo: November 5, 1999. Place: Guangzhou City, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



Jenny Zhang eating one scorpion, while her mother holding one next to her. Jenny is the daughter of Prof. Xia, shown also eating bugs in this page.

Time of photo: November 5, 1999. Place: Guangzhou City, Guangdong Province, China.
Copyrighted © by Bees.Net

[Home](#)



Melissa Huang, 6 years old, shows her bravery by eating a live queen larva. The wooden strips she is holding has many "queen cells" on it. Honey bee workers will build these queen cells and deposit abundant food (royal jelly) into each of them, provided that the colony has no queen and one "grafts" one larva into each queen cell cup. This method is used to rear large number of queens or to produce royal jelly. Before harvesting the royal jelly, one has to remove the queen larva in each cell. Melissa ate two of these queen larvae after I showed to her that I can do that. Her 9 year old brother refused to give it a try.

Time of photo: September 1997. Place: Champaign, Illinois. Photographer: Zachary Huang ©



I forgot to bring my camera this time while eating a bug dish! I was invited to taste the night life in Changsha, the capital of Hunan. We went to a place to eat "night meals", which was fully packed at midnight. I happened to see the cooked grasshoppers and ordered one. But no camera. so I put the hoppers in a styrofoam box and took the picture the next day. The grasshoppers were cooked with hotpeppers, and as with most of insects I have tried, fried. Unlike all other bugs I have eaten before, this one did not taste like freshly cooked. And the only one I had to throw some away!

Time of photo: November 30, 1999. Place: Changsha city, Hunan Province, China. Copyrighted © by Bees.Net

[Home](#)



Food Insects Newsletter **Thomas J.**

Elpel's
[Web World Portal](#)



[Granny's Country Store](#)

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

[HOPS Press, LLC](#)

Self-Service
Instant Wholesale Discounts

[Primitive Living Skills](#)

**Hollowtop Outdoor
Primitive School, LLC**

- Tom's Journals
- Skills Articles
- Directory of Schools

[Sustainable Living](#)

- Alternative Construction
- House-Building Classes
- Articles & Resources
- Ecological Economics

[Wildflowers & Weeds](#)

- Plant Identification
& Edible Plants
- Rangeland Ecology
- Weed Control Alternatives

[Society of
Primitive Technology](#)

- Bulletin of Primitive
Technology
- On-line Articles
- Subscription Information

[3Rivers Park](#)

A Place for People
Help us Secure the Rivers!

[What's New?](#)

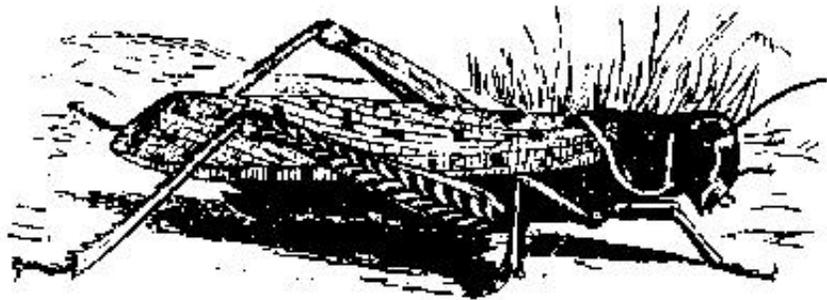
See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

**Granny's
Country Store**

PO Box 684
Silver Star, MT 59751-0684



The Food Insects Newsletter, Inc.
(A non-profit, Montana corporation)

Web space provided courtesy of [Hollowtop Outdoor Primitive School](#)

Updated July 5th, 2002

[-Click here to Subscribe and to Order Back Issues-](#)

[An important letter from the Assistant Editor, February 1999](#)

Selected on-line articles from FINL back issues:

March 1998: [Fried Grasshoppers for Campouts or at Home](#)

November 1997: [Food Insect Festivals of N.A.](#)

March 1996: [Raising Mealworms](#) (including recipies!)

July 1995: [Allergies Related to Food Insect Production and Consumption](#)

November 1994: [Some Insect Foods of the American Indians](#)

March 1993: [Food Conversion Efficiencies of Insect Herbivores](#)

July 1992: [Large-scale Feed Production from Manures with a Non-Pest Native Fly](#)

November 1991: [They Ate What?](#)

November 1990: [Collecting Ant Pupae for Food](#)

July 1989: [Hunter-gatherers were sometimes very labor-efficient](#)

November 1988: [Commercial Availability of Food Insect Products in the U.S.](#)

Check out these Insect & Bug Books!

[-Man Eating Bugs](#) by Peter Menzel & Faith D'Aluisio

[-Creepy Crawly Cuisine](#) by Julieta Ramos-Elorduy, Ph.D.

[-Eat-A-Bug Cookbook](#) by David George Gordon

[-Entertaining with Insects](#) by Ronald L. Taylor



[Other Food Insects Sites on the Web](#)



This [SurvivalRing](#) site is owned by the
[Food Insects Newsletter](#).

Want to join the [SurvivalRing](#)?



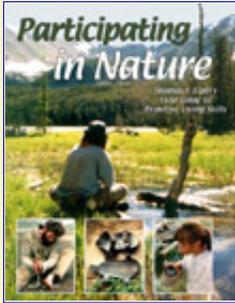
406-287-3605

[E-mail Contact Page](#)

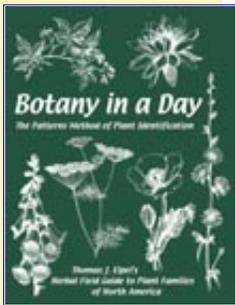


This Website Created on a lovable [Macintosh](#) computer!

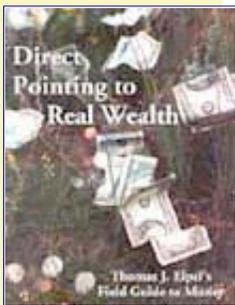
Books authored by
Thomas J. Elpel



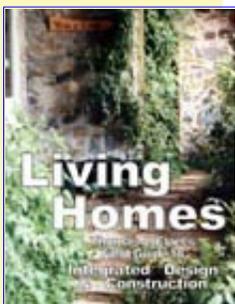
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

[\[Skip Prev\]](#) [\[Prev\]](#) [\[Next\]](#) [\[Skip Next\]](#) [\[Random\]](#) [\[Next 5\]](#) [\[List Sites\]](#) [\[Home\]](#)
[\[Stats\]](#)

Questions about the Food Insects Newsletter?
Send e-mail to [Robert E. Diggs](#), Assistant Editor.

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

Bugfood!

This page has moved!

Wait for a few seconds and you will automatically be taken to the new location OR

Click here:

<http://www.uky.edu/Agriculture/Entomology/ythfacts/bugfood/bugfood.htm>



[\[Home\]](#)[\[For Kids\]](#)[\[Bugfood!\]](#)[\[Mystery Bug\]](#)[\[Insects All Year\]](#) [\[Insect Stories\]](#) [\[Bug Fun!\]](#)[\[Read More About Bugs\]](#) [\[For Teachers and Parents\]](#)

University of Kentucky Department of Entomology

Bugfood!

[Bugfood I: Insect-themed Food](#)

[Bugfood II: Insects as Food](#)

[Bugfood III: Insect Snacks From Around the World](#)

Bug food cartoon courtesy of C. Ware, copyright 1997

University of Kentucky Department of Entomology

Original document: 7 July 1995

Last updated: 20 January 1999



[Return to UK Department of Entomology Katerpillars page](#)



[Return to UK Department of Entomology homepage](#)



[Return to University of Kentucky homepage](#)



University of Kentucky Department of Entomology

Entfact 813



Bugfood III: Insect Snacks from Around the World

By Lana Unger,
Extension Entomology Specialist

What is it about North American culture that keeps us from using one of our most abundant and readily available food sources, insects? We could learn a lot from our international neighbors. Many cultures around the globe have evolved to use insects in their diets. There was probably some trial and error involved because not all insects are edible. In fact, some insects are poisonous. But there are lots of insects that are safely eaten by people around the world.

Eating Insects in the Past...

Algeria - The natives of Algeria would collect large numbers of desert locusts to use as food. They were a valuable resource for the poor population. The locusts were cooked in salt water and dried in the sun. Not only were they collected for personal use, but the locusts were traded in the markets as well.

Australia - Australian natives, known as Aborigines, have eaten many different insects throughout history. Hundreds of Aborigines would come together at the Bogong mountains to feast on Bogong moths. These moths would gather in large numbers on the cave floors and in rock crevices. They were harvested, cooked in sand and stirred in hot ashes. This would burn off the wings and legs. The moths were then sifted through a net to remove their heads before they were eaten by the Aborigines. Some of the moths were ground into paste and made into cakes.

Another important insect in the Aboriginal diet was the witchety grub. This was a moth larva that lived in the roots of the acacia bush, also known as the witchety bush. The grubs were eaten raw or cooked in ashes. Cooked grubs

Bugfood!



Mystery Bug



Insects All Year



Bug Fun!



Insect Stories



Read More About Bugs



For Teachers and Parents



supposedly taste like almonds. The grubs were a valued food source in the Australian desert, especially to women and children.

Some of the insects eaten by the Aborigines were very sweet. The natives would dig into the ground looking for the nests of honeypot ants. The workers of these ants collect honeydew from scales and psyllids and feed it to other worker ants, which would become storage containers for the sweet liquid. The "storage" workers could be found in the nests.

The "honeybag" bee, a stingless native bee, also provided sweet treats for the Aborigines. The "honeybag" was actually the bees' hive. In order to find the "honeybag," the Aborigines would catch a bee that was feeding on nectar, use sticky plant juice to stick a leaf or flower petal to it, and set it loose. The bee would fly straight home. The attached leaf or petal would slow down the bee and make it easier to see and follow.

... and Present!

Japan - The Japanese have used insects as human food since ancient times. The practice probably started in the Japanese Alps, where many aquatic insects are captured and eaten. Thousands of years ago, this region had a large human population but a shortage of animal protein. Since the area had an abundance of aquatic insects, this food source became very important for human survival.

The Japanese still use insects in many recipes. If you were to go to a restaurant in Tokyo, you might have the opportunity to sample some of these insect-based dishes

- *hachi-no-ko* - boiled wasp larvae
- *zaza-mushi* - aquatic insect larvae
- *inago* - fried rice-field grasshoppers
- *semi* - fried cicada
- *sangi* - fried silk moth pupae

Most of these insects are caught wild except for silk moth pupae. They are by-products of the silk industry. Silk moths are raised in mass for their ability to produce silk. The larvae, the young silk moths, produce the silk. Once they pupate, they can no longer produce silk and are then used as food.

Kwara State, Nigeria, West Africa - People from this area have been known to feast on termites, crickets, grasshoppers, caterpillars, palm weevil larvae, and compost beetle larvae. Termites are collected by placing a bowl of water under a light source. The termites are attracted to the light and will then fall into the water. If large numbers of termites are gathered, they are sold at local markets. People of all ages eat the winged reproductive termites, but the queen termites are considered a delicacy and are only eaten by adults. The termites are roasted over a fire or hot coals or fried in a pot.

After cooking, the wings are removed and salt is added to taste.

Crickets are collected from soil tunnels which they build. The crickets are roasted over a fire or hot coals. The guts are removed before eating. Several taboos surround eating crickets. Members of the Yoruba tribes do not generally eat crickets. Many worship Ogun, the iron god, and he forbids animals that have no blood. Others believe that eating crickets is childish.

Grasshoppers are prepared and eaten in a manner similar to that for crickets, but there are more grasshoppers than crickets. They are eaten by people of all ages and there are no taboos associated with them. Some farmers will eat uncooked grasshoppers after they remove the grasshoppers' guts.

In some parts of Nigeria, the *Cirina forda* Westwood larva is reported to be the most important and widely eaten insect. This insect, often called Kanni, is a caterpillar that is collected from the sheabutter tree. It is boiled and dried in the sun before it is eaten. Kanni is widely used as an ingredient in vegetable soup in this region.

A very large edible insect is the palm weevil larva. It can be four inches long and more than two inches wide. The mature larvae are fleshy and grublike with a high fat content. These insects are collected from the trunks of palm trees. They are fried in a pot or frying pan. They are reported to be very delicious.

The compost beetle larvae are even larger than the palm weevil larvae. They live in garbage or manure piles or swampy areas. The end of the abdomen, which contains the guts, is removed before the larvae are washed and fried. Some people refuse to eat this insect because it is found in such "dirty" places.

Bali - Dragonfly and damselfly adults are hunted in Bali. Dragonflies are extremely difficult to catch but several interesting techniques have been used successfully. Latex, sticky plant juice, from the jackfruit tree is applied to the end of a slender stick. This stick is tied to a longer, sturdier stick. The stick is lower to a resting dragonfly and with a quick tap, the dragonfly is stuck to the plant juice. Dragonflies are also captured by hand, but one must be very quiet and quick. If latex is used to catch the insects, it is removed with cooking oil before the dragonflies are cooked. Sometimes the dragonflies are placed directly on the grate of a charcoal grill for cooking. Another method involves boiling them with ginger, garlic, shallots, chili pepper and coconut milk. The wings are removed before cooking unless they are charcoal roasted.

References

Cherry, R. H. 1991. Use of insects by Australian Aborigines. *American Entomologist* 37: 9-13.

Fasoranti, J. O., and D. O. Ajiboye. 1993. Some edible insects of Kwara State, Nigeria. *American Entomologist* 39: 113-116.

Pemberton, R. W. 1995. Catching and eating dragonflies in Bali and elsewhere in Asia. *American Entomologist* 41: 97-102.

Pemberton, R. W., and T Yamasaki. 1995. Insects: Old food in new Japan. *American Entomologist* 41: 227-229.

Note: If you are having a hard time locating these references, try your local college or university's entomology department. *American Entomologist* is a journal that is published by the Entomology Society of America and many entomologists are members of this society.

Bug food and mantid cartoons courtesy of C. Ware, copyright 1997

Last updated: 20 January 1999



[Return to *UK Department of Entomology Katerpillars page*](#)



[Return to *UK Department of Entomology homepage*](#)



[Return to *University of Kentucky homepage*](#)



ENTOMOLOGY

Iowa State University's Tasty Insect Recipes

As featured on The Tonight Show with Jay Leno!

[Insect Recipes](#)

[Bug Blox](#)

[Banana Worm Bread](#)

[Rootworm Beetle Dip](#)

[Chocolate Chirpie Chip Cookies](#)

[Crackers and Cheese Dip with Candied Crickets](#)

[Mealworm Fried Rice](#)

[Corn Borer Cornbread Muffins](#)

[Chocolate-Covered Grasshoppers](#)

[Nutrition](#)

[More treats](#)

[Where to Buy Insects](#)

[Insect Horror Film Festival](#)

[Entomology Club](#)

[Site Index](#)

IOWA STATE UNIVERSITY



Photo © [National Broadcasting Corporation](#), 1993

Recipes compliments of Kathy Gee and Julie Stephens (pictured above with Jay Leno) and the Iowa State University [Entomology Club](#).

Click at left for more information!

Disclaimer: The Department of Entomology at Iowa State University is not responsible for gastric distress, allergic reactions, feelings of repulsion, or other problems resulting from the ingestion of foods represented on these pages.

Edible Insects

or, more than you ever wanted to know about eating bugs

Recipes

Raising Insects

Links, Etc.

Books

Awards

FAQ

About the Author

All about edible insects:

Edible insects; you may feel that these two words do not even belong in the same sentence. You have every right to be skeptical. In all probability, you have never deliberately eaten an insect. However you have probably inadvertently consumed over a **pound** of insects in your lifetime.

Your insect consumption adds up. Flour beetles, weevils, and other insect pests that infest granaries are milled along with the grain, finally ending up as tiny black specks in your piece of bread. Small grubs and other tiny insects can be found in your fruit and vegetables. Insects are especially common in canned and other types of processed food, and even in certain beverages; I once went on a tour of an apple orchard and while the group was viewing the area where they separate the rotten and bug infested fruits from the good ones, I asked the tour guide what they did with the bug infested apples. She told me that they use them to make cider; waste not, want not! It is virtually impossible that you have not ingested insects in one form or another during your lifetime. And it probably did not harm you, but instead did you some good by providing extra protein in your meal!

There are a number of points that I would like to make:

- Some insects are edible. In fact, most insects are edible, but there are a few species that are especially palatable, nutritious, and easily obtainable. I will concentrate on these.
- Many species of insects are lower in fat, higher in protein, and have a better feed to meat ratio than beef, lamb, pork, or chicken.
- Insects are tasty. Really! Even if you are too squeamish to have them as a main dish, you can make insect flour and add it to bread and other dishes for an added protein boost.
- Insects are easy to raise. There is no manure forking. No hay bale lifting. No veterinary bills. You can raise them in an apartment without getting complaints.
- Insects are beautiful. I think that all insects are beautiful, but most people I know will marvel at the iridescence of a butterfly, but shudder at the striping of a mealworm.
- Most people do not mind butchering insects. The butchery of insects is very simple compared with that of cattle or poultry, and nowhere near as gory.
- Raising insects is environmentally friendly. They require minimal space per pound of protein produced, have a better feed to meat ratio than any other animal you can raise, and are very low on the food chain. They are healthy, tasty, and have been utilized for the entire history of mankind (after all, it is easier to catch a grub than a mammoth).
- Also, as far as I know, no animal rights activists object to the eating of insects. You don't need to destroy any wildlife habitat to eat insects, and you can incorporate insects and earthworms into a recycling program.....vegetable waste in, yummy insect protein out.

O.K., O.K., I admit the slight possibility of disadvantages...

The only real problem you may run into while utilizing insect protein is the lack of social acceptance. That is why we sensible insect eaters must make it our duty to educate the public about the value of insect protein. You may encounter widespread disbelief, "You're kidding me. You *don't* eat insects!", revulsion "Yuck! You eat *insects!?!*", and refusal "You will *not* ever get me to eat insects." Press on! Remember, insects are the food of the future, and you are paving the way for future generations.

Is there a better name for it than insect eating?

Why yes, there is. The word is Entomophagy. You would think that a word this melodious would be in common usage, but sadly this is not the case. In fact, you probably have never heard this word before (unless you happen to be a friend of mine). Find ways to interject the word entomophagy in casual conversation, as in: "Did I ever tell you about the stunning array of culinary options revealed through the study of *entomophagy*?"

Other Random Entomophagy Factoids

In case you need a little more persuasion:

There are 1,462 *recorded* species of edible insects. Doubtless there are thousands more that simply have not been tasted yet.

100 grams of cricket contains: 121 calories, 12.9 grams of protein, 5.5 g. of fat, 5.1 g. of carbohydrates, 75.8 mg. calcium, 185.3 mg. of phosphorous, 9.5 mg. of iron, 0.36 mg. of thiamin, 1.09 mg. of riboflavin, and 3.10 mg. of niacin.

Compare this with ground beef, which, although it contains more protein (23.5 g.), also has 288.2 calories and a whopping 21.2 grams of fat!

NOTE:

I am no longer updating or maintaining this site. For a project that I am currently fozzling about with, visit sunfall.com (geek girl comics for the hoi polloi).



Cyberbee.msu.edu

Home
About
Bees@msu
Bees4Kids
Beebase
BeeBiology
BeeCalendar
BeeContact
BeePhotos
BeeProducts
BeeResearch
BeeStats
General News
Research News
Zach's Column
CoolBeeLinks
SearchCyberbee
BeeMyGuest

CyberBee is a service
provided by
Zachary Huang
Dept Entomology,
MSU

©Zachary Huang

[Site statistics](#)

Welcome to cyberbee.msu.edu!
please click [here](#) for another picture
Also checkout the new searchable
[photobase](#).

Photos copyrighted, all rights reserved by Zachary Huang
Main photo page viewed 32726 times since May 12, 2003

Santa Fe Institute Social Insects Working Group

October 5-7, 2000. [October 9-14, 2001](#)

Upcoming Workshop: May 22-26, 2002

[Preprint, Reprint Center \(IE recommended, Password required\)](#)
[The Evolutionary Dynamics of Social Organization in Insect Societies](#)

Organized by [R.E. Page](#), J. Erber, and [J. Fewell](#)

1. [Objectives of the Working Group](#)
2. [List of Participants \(Alphabetical listing\)](#)
3. [List of Participants \(Graphic links\)](#)
4. [Questions Discussed](#)
5. [Group Reports](#)
6. [What Did We Achieve?](#)
7. [Future Activities](#)



Webmaster: [Zachary Huang](#)

Welcome to the MSU Apiculture Laboratory

[\[Overview\]](#) [\[Research\]](#) [\[People\]](#) [\[Links\]](#) [\[Cyberbee\]](#) [\[ANR Beekeeping Program\]](#) [\[New Bee Picture\]](#)

All pictures, unless otherwise noted, are copyrighted by Zachary Huang

You are visitor # **16661** since June 1, 2003



Department of Entomology
Michigan State University
Est. 1904

What's New

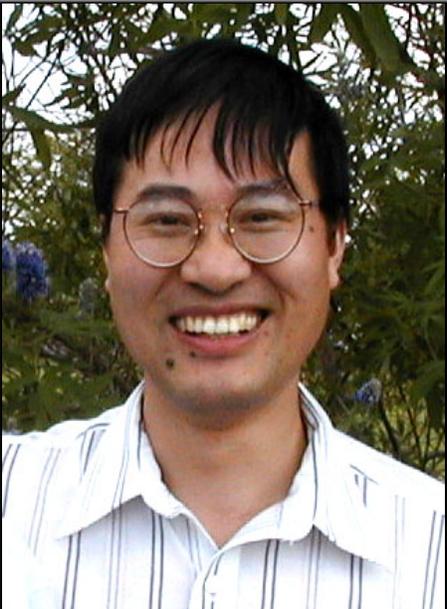
Search

Index

Feed Back

Go Home

Need Help ?



ZACHARY Y. HUANG

Assistant Professor
Ph.D. University of Guelph,
Canada (1988)

Almost anything related to honey bees interests Huang. Current research topics include: effect of *Nosema apis* on worker behavior and physiology, reproductive biology of Varroa mites, cloning the sodium channel genes of the Varroa mite to determine if mutation of this gene is responsible for mite resistance to Apistan (in collaboration with [Ke Dong](#)), effect of transgenic pollen on health of honey bees and as possible agents for pest control, and the role of melatonin in regulating social behavior in honey bee workers. He is the webmaster of a popular web site on bees, cyberbee.msu.edu and teaches two courses ([Biology of Social Insects](#) and [Apiculture and Pollination](#)). He recently invented a new device for Varroa mite control and a patent was granted to the Michigan State University.

[Recent Publications](#)

[Current Curriculum Vitae](#)

Email: bees@msu.edu

Phone: 517-353-8136

Location: 445B Natural Science

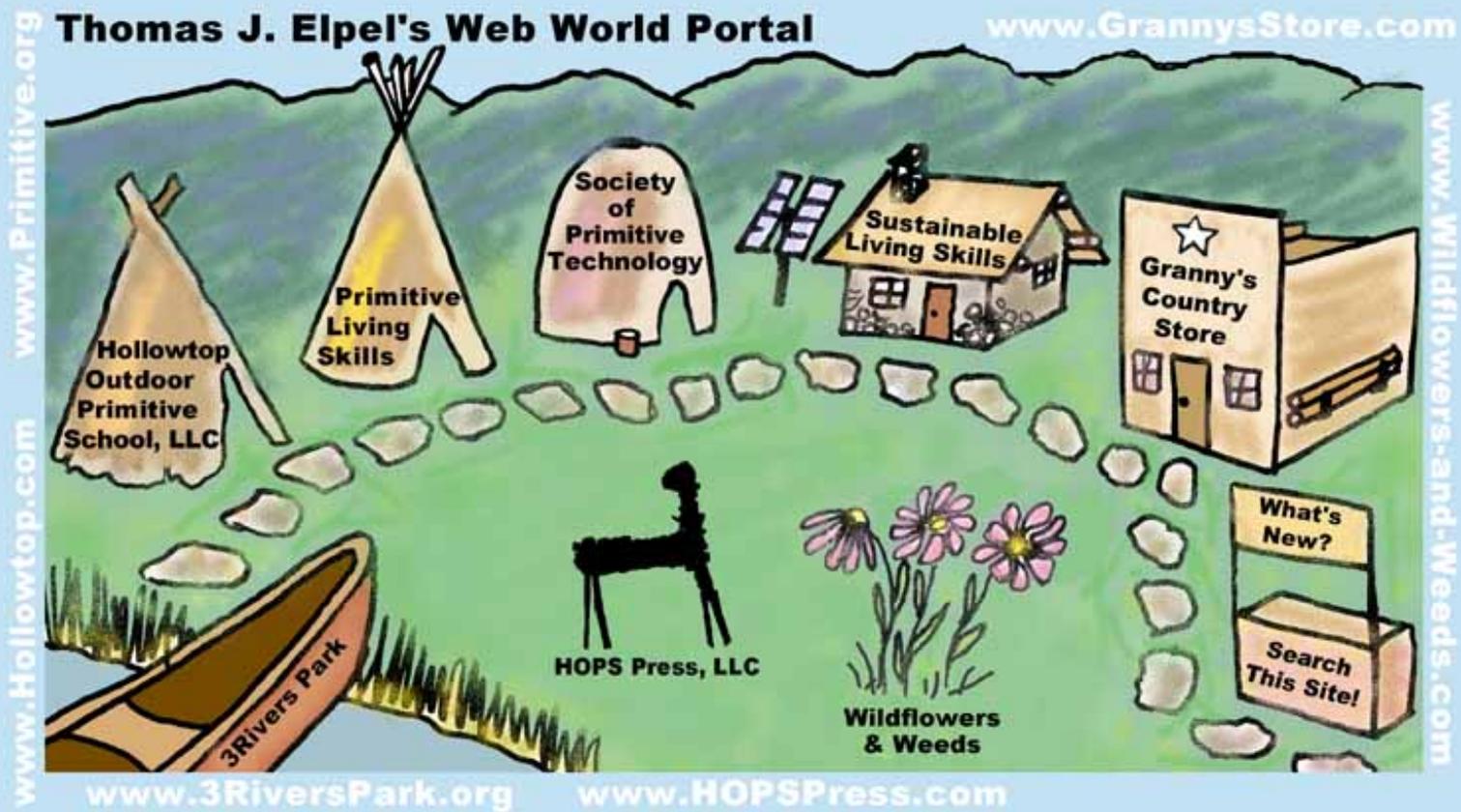
Web Sites: Research: <http://bees.msu.edu>
Extension: <http://cyberbee.msu.edu>
Invention: <http://www.mitezapper.com>
Photography: <http://photo.bees.net>
Just for Fun: <http://eat.bees.net>
Lab Members Only: [\(password required\)](#)



Maintained by [Zachary Huang](#)
©2002 Department of Entomology

Updated: October 2, 2003
URL: <http://www.msu.edu/user/bees/>

Visitors since 10/2/2003: **16661**



Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

**Granny's
COUNTRY STORE
SILVER STAR, MT**

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor
Primitive School, LLC
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

**Granny's
Country Store**

PO Box 684
Silver Star, MT 59751-0684
406-287-3605



-Granny's Country Store & Historic Post Office-

Worldwide service from the middle of nowhere!

Silver Star, Montana 59751

Population: 60

[History of Silver Star](#) | [Neighborhood Links](#)

Granny's Country Store
Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids



**Granny's
COUNTRY STORE
SILVER STAR, MT**

How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

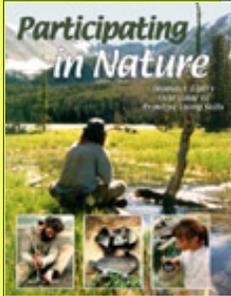
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605

E-mail Contact Page

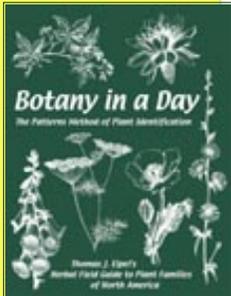


This Website Created on a lovable
Macintosh computer!

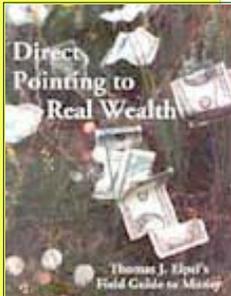
Books authored by
Thomas J. Elpel



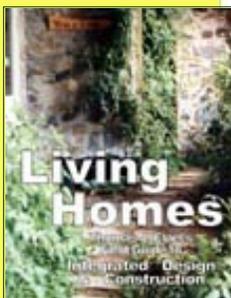
Participating in Nature



Botany in a Day



Direct Pointing
to Real Wealth



Living Homes

E-mail Contact Page

Thomas J. Elpel's Web World Portal
Granny's Country Store
HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

Granny's Country Store Departments
Tom's Books & Videos
Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids

Granny's COUNTRY STORE SILVER STAR, MT

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

- Tom's Books & Videos
- Primitive Wilderness Survival
- Nature, Wildlife & Tracking
- Plant Identification & Ecology
- Home-Building Books
- Green Goods for the Home
- Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills Hollowtop Outdoor Primitive School, LLC

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

Granny's Country Store

PO Box 684
Silver Star, MT 59751-0684



Unique Books & Videos By Thomas J. Elpel

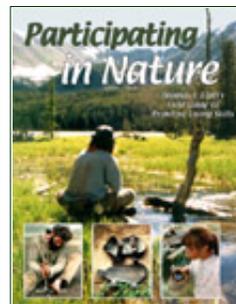
Updated January 31st, 2004

Click on any link to learn more about the product.

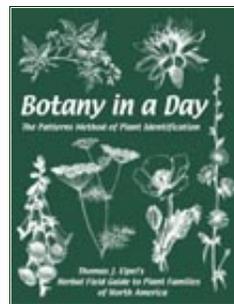
Most items ship within 24 - 48 hours....

except when we are out in the woods for a few days!

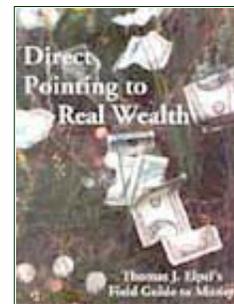
Take a look at our [Environmental Record](#) in business.



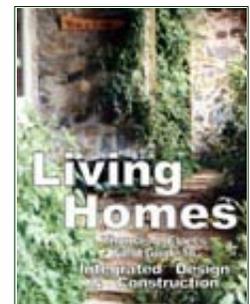
[Participating
in Nature](#)



[Botany
in a Day](#)



[Direct Pointing
to Real Wealth](#)



[Living
Homes](#)

Unique Books & Videos by Thomas J. Elpel

Participating in Nature: *Thomas J. Elpel's Field Guide to Primitive Living Skills*

Botany in a Day: *The Patterns Method of Plant Identification*

Direct Pointing to Real Wealth: *Thomas J. Elpel's Field Guide to Money*

Living Homes: *Thomas J. Elpel's Field Guide to Integrated Design & Construction*

The Art of Slipform Stone Masonry *Video Companion to Living Homes*

The Art of Nothing Wilderness Survival Video Series

(Recorded on quality recycled VHS video tapes.)

3 Days at the River *with nothing but our bare hands.*

Mountain Meadows *camping with almost nothing but the dog.*

Mountain Lakes *a survival fishing trip.*

Hello Tom!

Just finished reading **Participating In Nature** and I loved it. I am a Tom Brown student, as well as a fan of Mors Kochanski and any other primitive skills authors I can find. Your book is very refreshing in that it reads as such a nice adventure story that teaches all along. There are also many ideas and skills that I have never encountered in other books and that is wonderful. I really enjoy the realistic approach to the philosophy of living well within today's society. Thanks!

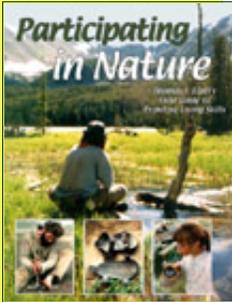
--Dale Kiselyk

406-287-3605
[E-mail Contact Page](#)

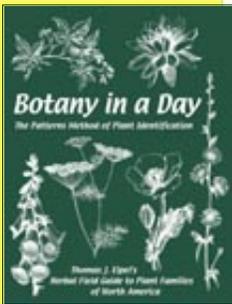


This Website Created on a lovable
Macintosh computer!

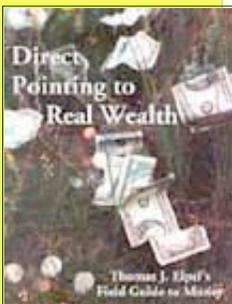
Books authored by
Thomas J. Elpel



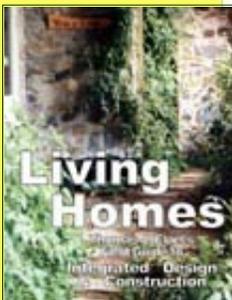
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



[Living Homes](#)

A.K.A.: *Nature Boy*
Nature Boy's Wilderness Living and Survival Instruction
(used with permission)

[Return to the HOPS Press, LLC Home Page.](#)



How to Place Retail Orders

[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

Granny's COUNTRY STORE SILVER STAR, MT

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

- Tom's Books & Videos
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor Primitive School, LLC

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

Granny's Country Store

PO Box 684
Silver Star, MT 59751-0684



Granny's
Country Store
www.GrannysStore.com

Primitive Wilderness Survival Supplies

Updated January 31st, 2004

Click on any link to learn more about the product.

Most items ship within 24 - 48 hours....

except when we are out in the woods for a few days!

Take a look at our [Environmental Record](#) in business.

Unique Survival & Nature Guides by Thomas J. Elpel

[Participating in Nature](#): *Thomas J. Elpel's Field Guide to Primitive Living Skills*

[Botany in a Day](#): *The Patterns Method of Plant Identification*

See a complete list of [Thomas J. Elpel's Books & Videos](#).

The Art of Nothing Wilderness Survival Video Series

With Thomas J. Elpel and special guests.

(Recorded on quality recycled VHS video tapes.)

[3 Days at the River](#) with nothing but our bare hands.

[Mountain Meadows](#) camping with almost nothing but the dog.

[Mountain Lakes](#) a survival fishing trip. **Primitive Fire-Making Tools**

-Flint & Steel Kits

-Bowdrill Fire Sets

-Handdrill Fire Sets

-Fire Plow Sets

-Fire Pistons

-Oakum Tinder Water Purification

-Iodine Crystals for water purification **Northern Skills Books & Videos**

-Bush Craft by Mors Kochanski

-16 Wilderness Survival Pocketbooks by Mors Kochanski

-Four Wilderness Skills Videos by Mors Kochanski

-7 Plant Videos + Master Tape by Mors Kochanski

-Snow Caves by Ernest Wilkinson **Primitive Skills Books & Videos**

-Earth Knack by Bart & Robin Blankenship

-Outdoor Survival Skills by Larry D. Olsen

-Survival Arts of the Primitive Paiutes by Margaret M. Wheat

-Survival Skills of Native California by Paul D. Campbell

-Primitive Technology: A Book of Earth Skills Edited by David Wescott

-Primitive Technology II: Ancestral Skills Edited by David Wescott

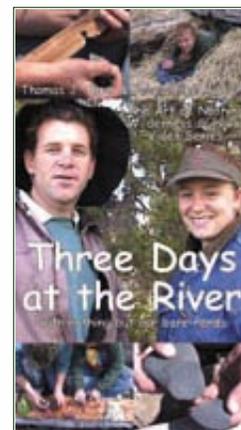
-Primitive Wilderness Living & Survival Skills by John & Geri McPherson

-Primitive Wilderness Skills, Applied & Advanced by John & Geri M.

-Eight Primitive Wilderness Skills Videos by John McPherson

-Woodsmoke, The Best of Edited by Richard & Linda Jamison

-Woodsmoke: Primitive Outdoor Skills Edited by Richard & Linda Jamison



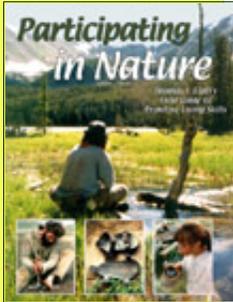
406-287-3605

[E-mail Contact Page](#)

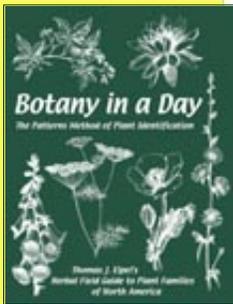


This Website Created on a lovable **Macintosh** computer!

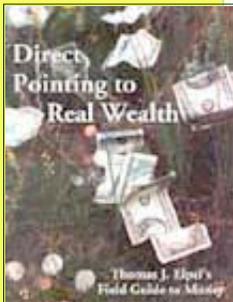
Books authored by **Thomas J. Elpel**



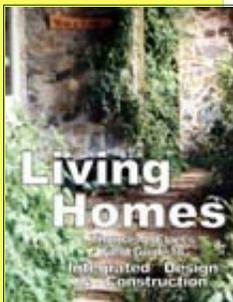
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

[-Woodsmoke: Collected Writings](#) *Compiled by Richard & Linda Jamison*

[-Six Woodsmoke Videos](#) *by Richard & Linda Jamison*

[-Four Videos from Northwest Video Productions](#)

[-Thirteen Woodsmoke Videos](#) *by Ron Hood*

[-Three Cave Cooking Videos](#) *by Karen Hood*

[-Primitive Technology: Practical Guidelines](#) *by Errett Callahan*

[-How to Make Primitive Pottery](#) *by Evard Gibby* **Flint Knapping Books & Videos**

[-2004 Flintknapping Calendar](#)

[-The Art of Flint Knapping](#) *by D.C. Waldorf*

[-5 Great Flintknapping Videos](#) *by D.C. Waldorf*

[-Best of the Story in Stone Poster](#) *illustrated by Valerie Waldorf*

[-The Basics of Biface Knapping](#) *by Errett Callahan*

[-Pressure Flaking Flash Cards](#) *by Errett Callahan*

[-Welcome Back to the Stone Age Video](#) *by Woody Blackwell* **Bow-Making, Primitive Archery & Atlatls**

[-The Art of Making Primitive Bows and Arrows](#) *by D.C. Waldorf*

[-The Flat Bow](#) *by Ben Hunt & John Metz*

[-Bows and Arrows of the Native Americans](#) *by Jim Hamm*

[-The Bowyer's Bible, Volumes 1, 2 & 3](#) *by Jim Hamm & Others*

[-Enc. of Native American Bows, Arrows & Quivers, Vol. 1 & 2](#) *by Allely and Hamm*

[-Ishi & Elvis](#) *by Jim Hamm*

[-Whitetail Tactics with Recurves & Longbows](#) *by Jim Hamm*

[-Making Indian Bows and Arrows the Old Way](#) *by Douglas Spotted Eagle*

[-Roving Handbook](#) *by Errett Callahan*

[-The Atlatl: Primitive Weapon of the Stone Age](#) *by Kris Tuomala*

[-Sinews and Hide Glue Braintan Buckskin: Books, Videos, Tools, & Finished Hides](#)

[-Wet-Scrape Books, Videos and Tools](#)

[-Dry-Scrape Books, Videos and Tools](#)

[-Braintan Buckskin For Sale](#) **Primitive Canoeing and Fishing**

[-Building a Birchbark Canoe](#) *by David Gidmark*

[-Canoeecraft: Woodstrip Construction](#) *by Ted Moores*

[-Indian Fishing](#) *by Hilary Stewart* **Primitive Shelter**

[-Authentic Mongolian Felt Gers](#) (Popularly known as "yurts".) **Primitive Musical Instruments**

[-Stoneware and Recycled Plastic Ocarinas](#)

[-Make Your Own Five Hole Flute from Recycled PVC](#) **Books about**

Wilderness Schools

[-Aboman's Guide to Wilderness Schools](#) *by Joseph A. Bigley*

[-Shouting at the Sky](#) *by Gary Ferguson* **Basketry**

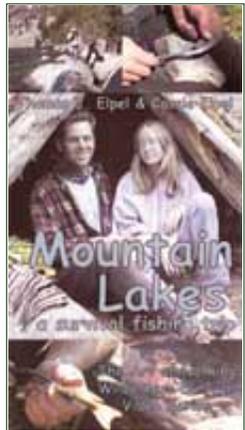
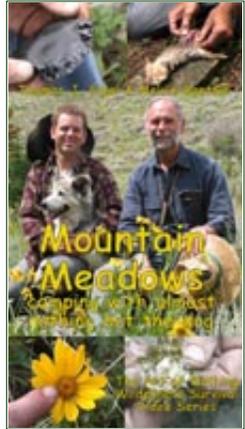
[-Barbwire Hearts](#)

[-Barbwire Baskets](#)

Also be sure to visit these pages:

[Nature, Wildlife & Tracking Resources](#)

[Plant Identification & Ecology Guides](#)



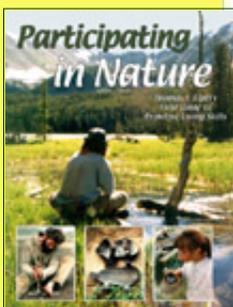
Dear Tom & Renee,

I was shocked when I opened my mailbox on Thursday and there were my Advanced Bird Language tapes. I just ordered them on Monday! Thank you so much for getting them out so quickly.

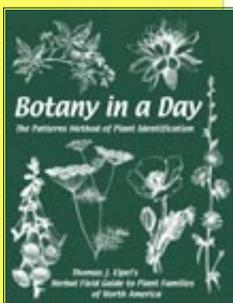
I also enjoyed the papers they were wrapped in --kudos to you for your recycling efforts!

--Joyce D.
Golden, Colorado
(used with permission)

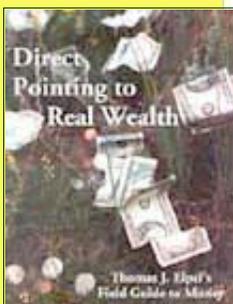
Hello Tom!



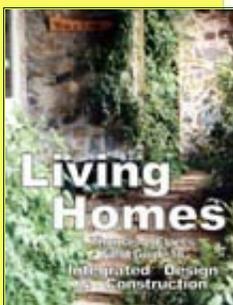
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Just finished reading [Participating In Nature](#) and I loved It. I am a Tom Brown student, as well as a fan of Mors Kochanski and any other primitive skills authors I can find. Your book is very refreshing in that it reads as such a nice adventure story that teaches all along. There are also many ideas and skills that I have never encountered in other books and that is wonderful. I really enjoy the realistic approach to the philosophy of living well within today's society. Thanks!

--Dale Kiselyk

A.K.A.: Nature Boy

Nature Boy's Wilderness Living and Survival Instruction
(used with permission)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store

PO Box 684

Silver Star, MT 59751-0684

406-287-3605

[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

Granny's
COUNTRY STORE
SILVER STAR, MT

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
[Primitive Wilderness Survival](#)
[Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#)
[Green Goods for the Home](#)
[Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor
Primitive School, LLC

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

Granny's
Country Store

PO Box 684
Silver Star, MT 59751-0684



Nature, Wildlife and Tracking Guides

Updated January 21st, 2004

Click on any link to learn more about the product.

Most items ship within 24 - 48 hours....

except when we are out in the woods for a few days!

Take a look at our [Environmental Record](#) in business.

Tracking Books & Videos

[-Mammal Tracking in North America](#) by James Halfpenny

[-Tracking Elk for Hunters Video](#) by James Halfpenny

[-Animal Tracks](#) by Olaus J. Murie **Astronomy Books**

[-The Stars](#) by H. E. Rey **Awareness Books, Tapes, Resources and Perspective**

(This is a combination article and book reviews.)

[-Tom Brown Jr. Autobiographies & Field Guides](#)

[-Jon Young Audio Tapes](#)

[-Jon Young's Kamana Naturalist Training Program](#)

[-Chris Chisholm's Wolf Journey Part One](#)

Also see these related pages:

[-Jon Young Native Awareness Resources](#)

[-The Secrets of Natural Movement videos](#) by John Stokes **Bird Identification & Interpreting Bird Language**

(This is a combination article and book/tape reviews.)

[-Learning the Language of the Birds](#) with Jon Young

[-Advanced Bird Language](#) with Jon Young

[-Sibley Guide to Birds](#) by David Allen Sibley

[-Sibley Guide to Bird Life & Behavior](#) by David Allen Sibley

Natural Science Books

[-The Evolution Book](#) by Sara Stein

Also be sure to visit these pages:

[Primitive Wilderness Survival Resources](#)

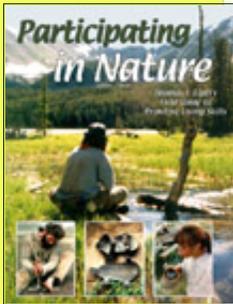
[Plant Identification & Ecology Guides](#)

406-287-3605
[E-mail Contact Page](#)

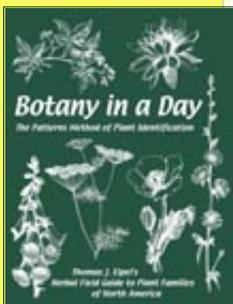


This Website Created on a lovable
Macintosh computer!

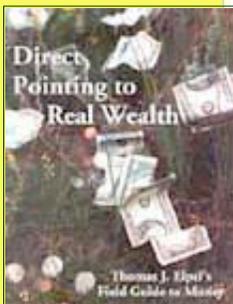
Books authored by
Thomas J. Elpel



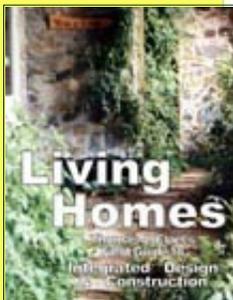
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



[Living Homes](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

**Granny's
COUNTRY STORE
SILVER STAR, MT**

PO Box 684
Silver Star, MT 59751
406-287-3605

**Thomas J. Elpel's
Web World Portal**



Granny's Country Store

Tom's Books & Videos
[Primitive Wilderness Survival](#)
[Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#)
[Green Goods for the Home](#)
[Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:



Plant Identification & Ecology Resources

Updated February 6th, 2004

Click on any link to learn more about the product.

Most items ship within 24 - 48 hours....

except when we are out in the woods for a few days!

Take a look at our [Environmental Record](#) in business.

Unique Plant Guides by Thomas J. Elpel

[Botany in a Day: The Patterns Method of Plant Identification](#)

[Participating in Nature: Thomas J. Elpel's Field Guide to Primitive Living Skills](#)

See a complete list of [Thomas J. Elpel's Books & Videos](#).

The Art of Nothing Wilderness Survival Video Series

(Recorded on quality recycled VHS video tapes.)

[3 Days at the River](#) with nothing but our bare hands.

[Mountain Meadows](#) camping with almost nothing but the dog.

[Mountain Lakes](#) a survival fishing trip.

(Videos include brief segments on harvesting and eating wild plants.)

Recommended Companions to Botany in a Day

[NEW! -An Easier Way to Identify Plants](#) A short on-line article.

[NEW! -Botanical Loupes](#) Hand-lenses for magnification.

[-Golden Guide to Wildflowers of N. America](#) by Frank D. Venning

[NEW! -Plant Identification Terminology](#) by James & Melinda Harris

[-Plants of Pacific NW Coast](#) by Pojar & MacKinnon,

[-Plants of the Rocky Mountains](#) by Kershaw, MacKinnon, Pojar

[-Newcomb's Wildflower Guide](#) by Lawrence Newcomb

Wild Edible Plant Resources

[-From Crabgrass Muffins to Pine Needle Tea](#) by Linda Runyon

[-Guide to Wild Foods and Useful Plants](#) by Christopher Nyerges

[-Exploring Common Useful Plants of the U.S. \(video\)](#) by Christopher Nyerges

[-7 Plant Videos + Master Tape](#) by Mors Kochanski

[-Dining On The Wilds Edible Plants Videos](#) by Kramer & Goude

Herbal Guides & Wilderness First Aid

[-Medicinal Plants of the Pacific West](#) by Michael Moore

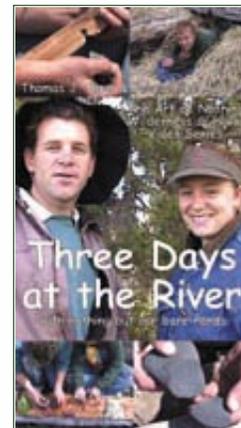
[-Medicinal Plants of the Desert & Canyon West](#) by Michael Moore

[-Medicinal Plants of the Mountain West](#) by Michael Moore

[-Kids, Herbs, & Health](#) by White & Mavor

[-Medicine For The Outdoors](#) by Paul S. Auerbach, M.D.

[-Rogers' Herbal Manual](#) by Robert Dale Rogers



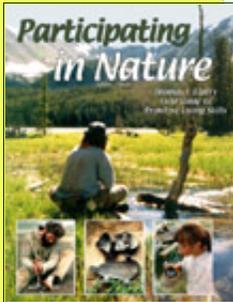
Granny's Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

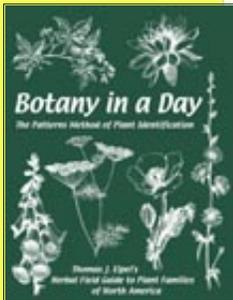


This Website Created on a lovable
Macintosh computer!

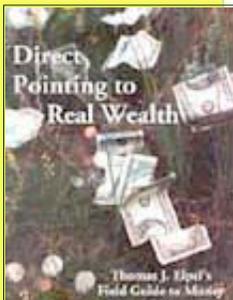
Books authored by
Thomas J. Elpel



[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)

Mushroom Identification & Edibility

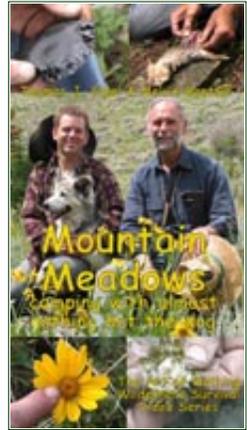
- [Mushrooms Demystified](#) by David Arora
- [All That the Rain Promises](#) by David Arora
- [Mushrooms of NW North America](#) by Helene M.E. Schalkwijk-Barendsen
- [Growing Gourmet and Medicinal Mushrooms](#) by Paul Stamets

All about Dandelions

- [The Dandelion Celebration](#) by Peter Gail
- [Dandy Blend Coffee Substitute](#)

Grassfed Livestock, Range Ecology & Resource Management

- [Why Grassfed is Best!](#) by Jo Robinson
- [Salad Bar Beef](#) by Joel Salatin
- [Holistic Management](#) by Allan Savory
- [Creating a Sustainable Civilization Video](#) by Allan Savory



Also be sure to visit these pages:

- [Primitive Wilderness Survival Resources](#)
- [Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

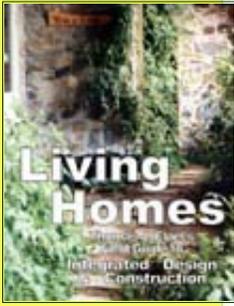
Granny's Country Store Departments
[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)



[Living Homes](#)

**Granny's
COUNTRY STORE
SILVER STAR, MT**

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

**Granny's
Country Store**

PO Box 684
Silver Star, MT 59751-0684



Home-Building Books & Videos Alternative House-Building Resources

Resource Efficient Planning & Design

Strawbale | Papercrete | Stone Masonry | Cordwood | Log Homes

Timber Framing | Earthships | Domes

Earth Construction: Rammed Earth, Ceramic, Earthbag, Cob

Insulation Alternatives | Masonry Stoves

Links for designing and building your own Resource-Efficient, healthy home.

- Solstice -Good info on alternative construction, energy efficiency and renewable energy
- CSF: Earthfriendly and Self-Sufficient Architecture Discussion Board
- Country Home Design/BuildDiscussion Board
- Natural Life: Sustainable Shelter Links
- Center for Resourceful Building Technology
- E-Building Codes - International Building Codes
- Southwest Desert Sustainability Project
- Building with Awareness
- The Humanure Handbook On-Line

Home Planning and Design Books from Our Home-Builder's Store:

- The Real Goods Independent Builder by Sam Clark
- The New Independent Home by Michael Potts
- The Natural House by Daniel Chiras
- The Art of Natural Building by Kennedy, Smith and Wanek
- The Whole House Book by Pat Borer and Cindy Harris
- The Solar House by Daniel Chiras
- The Passive Solar House by James Kachadorian

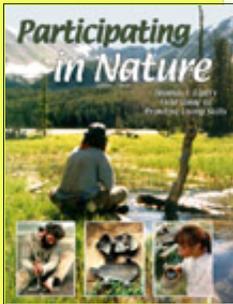
406-287-3605

[E-mail Contact Page](#)

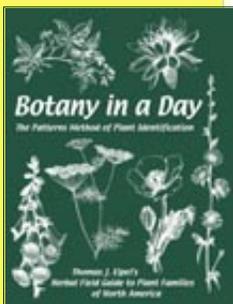


This Website Created on a lovable
Macintosh computer!

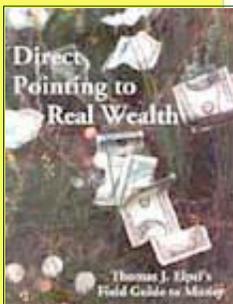
Books authored by
Thomas J. Elpel



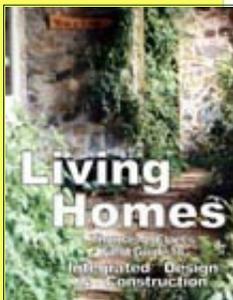
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



[Living Homes](#)

Schools for designing and building your own Resource-Efficient, healthy home

- [Institute for Solar Living / Real Goods](#) (Near San Francisco, California)
- [Solar Energy International](#) (Nationwide Workshops)
- [Institute for Social Ecology](#)
- [Virtual Mountain Wilderness School](#)

Strawbale Links

- [U.S. D.O.E.: Strawbale Comes of Age](#)
- [C.R.E.S.T.: On-line Strawbale Construction Resources](#)
- [Surfin' Strawbale: Online Resources](#)
- [Burbophobia: An Excellent List of Strawbale Resources](#)
- [Strawbale Links](#)
- [STRAP: The Strawbale Regional Assistance Project](#)
- [Terra Home: Structural Frames for Arched Strawbale Homes](#)

Strawbale House Books from Our Home-Builder's Store:

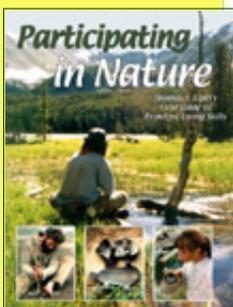
- [Strawbale Construction \(A Brief Overview\)](#)
- [Living Homes: Integrated Design & Construction](#) - by Thomas J. Elpel
- [The Strawbale House](#) - by Athena Swentzell Steen, Bill Steen, David Bainbridge & David Eisenberg.
- [The Beauty of Strawbale Homes](#) - by Bill and Athena Steen
- [Serious Strawbale: A Home Construction Guide for All Climates](#) - by Paul Lacinski, Bergeron Lacinski & Michel Bergeron
- [Straw Bale Building: How to plan, design & build with straw](#) - by Chris Magwood & Peter Mack
- [Straw Bale Details: A Manual for Designers and Builders](#) - by Chris Magwood & Chris Walker
- [Building with Earth and Straw](#) - by Bruce King, P.E.
- [Strawbale Home-Builder's Dreampack](#) - Be informed before you build!
- [Build It With Bales: A Step-By-Step Guide to Straw-Bale Construction, Version Two](#) - by S. O. MacDonald, Matts Myhrman
- [Strawbale Homebuilding](#) Edited by Alan T. Gray and Anne Hall

Strawbale Construction Schools

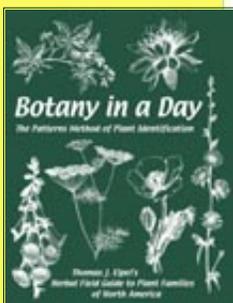
- [Institute for Solar Living / Real Goods](#) (Near San Francisco, California)
- [Solar Energy International](#) (Nationwide Workshops)
- [Sage Mountain Center](#) Whitehall, Montana.

Papercrete (Fibrous Cement) and Related Links

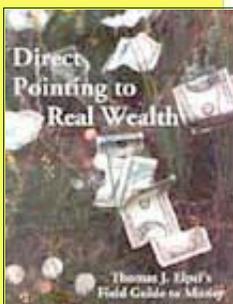
- [Building with Papercrete and Paper Adobe](#)
- [Papercrete News](#)
- [Fibrecrete.com](#) A Patent-pending cement and fiber building system.



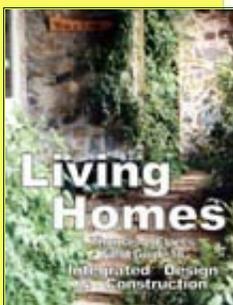
[Participating in Nature](#)



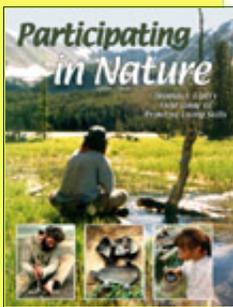
[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)

Papercrete House Books

- [Building with Papercrete and Paper Adobe](#)

Stone Masonry Links

- [Kootenay Stone Masonry Training School](#)
- [Multi-Arc Tool for Masonry Arches](#)
- [Cultured \(Artificial\) Stone](#)
- [Masonry Advisory Council](#)
- [Stone World \(Trade Magazine\)](#)

Stone Masonry Books from Our Home-Builder's Store:

- [Stone Masonry Construction \(A Brief Overview\)](#)
- [Living Homes: Integrated Design & Construction](#) - by Thomas J. Elpel
- [Building Stone Walls](#) by John Vivian
- [Stonework: Techniques and Projects](#) by Charles McRaven
- [Building With Stone](#) by Charles McRaven
- [The Stonebuilder's Primer: A Step-By-Step Guide for Owner-Builders](#) - by Charles K. Long
- [Stone Mason's Dreampack](#) - Be informed before you build!

Stone Masonry Schools & Organizations

- [Hollowtop Outdoor Primitive School](#) (Montana)
- [Stone Foundation](#) A society of stonemasons and others involved with and /or interested in stone, stonework and stone art.
- [Dry Stone Conservancy](#) Working to promoting and preserving dry-stacked stone walls.
- [Irish Stone Walls & Buildings](#) Includes classes in Ireland.
- [Learning Stone](#) Includes a resource directory and forum for sharing ideas about working with stone.

Cordwood Construction Links

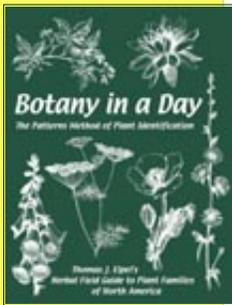
- [Cordwood Newbee Page](#)
- [Cordwood Message Board](#)
- [DayCreek.com--Cordwood Construction and More!](#)

Cordwood Construction Books

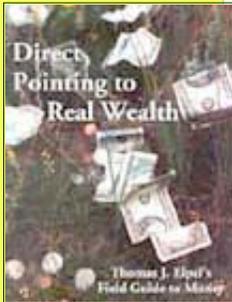
- [Complete Book of Cordwood Masonry Housebuilding: The Earthwood Method](#) - by Rob Roy
- [Cordwood Construction: A Log End View](#) - by Richard Flatau

Cordwood Construction Schools

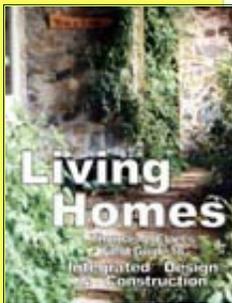
- [Sage Mountain Center](#) Whitehall, Montana.



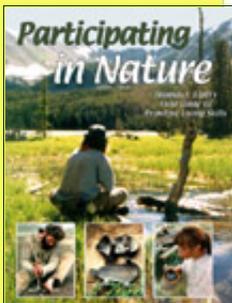
[Botany in a Day](#)



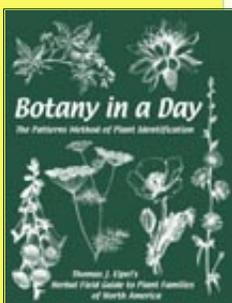
[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



[Botany in a Day](#)

Log Home Links

- [Building a Log Cabin--Construction Photo Album](#)
- [Sunrise Productions Log Home Bookstore](#)
- [Linking Logs--Directory of Builders, Schools, etc.](#)
- [LogHomeLinks.com--Lots of Links!](#)
- [Log Home NetZine--On-line Newsletter](#)
- [Log House Construction Problems](#)
- [Skip Ellsworth Log Building Method](#)
- [International Log Builders Association](#)
- [Dream Dove Tail Tool](#)

Log Home Books from Our Home-Builder's Store:

- [Living Homes: Integrated Design & Construction](#) - by Thomas J. Elpel
- ["How-to" Build This Log Cabin for \\$3,000](#) - by John McPherson
- [Log Construction Manual](#) - by Robert W. Chambers

Log Home Building Schools

- [Montana School of Log Building](#)
- [Island School of Building Arts](#)
- [Chapman Log Construction](#)
- [Great Lakes School Of Log Building](#)
- [William M. Lasko School of Log Building](#)
- [Okanagan University College](#)
- [Pine Top School of Log Building](#)

Timber Framing Links

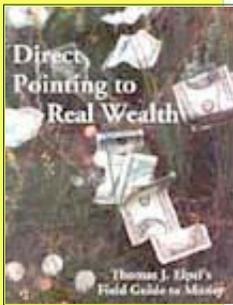
- [Joiner's Quarterly Journal of Timber Framing & Traditional Building](#)
- [Timber Framing Magazine Online](#)

Timber Frame Construction Books from Our Home-Builder's Store:

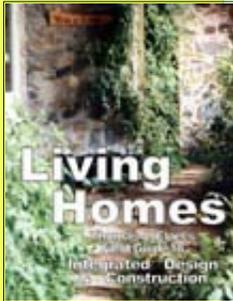
- [Timber Frame Construction](#) - by Jack Sobon & Roger Schroeder
- [Build a Classic Timber-Framed House](#) - by Jack Sobon
- [A Timber Framer's Workshop](#) - by Steve Chappell
- [Out of the Woods](#) - by Pat Borer & Cindy Harris
- [Timber-Framer's Dreampack](#) - Be informed before you build!

Timber Framing Schools

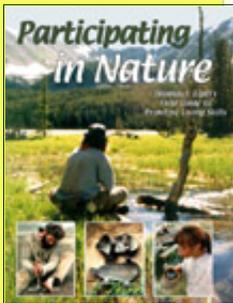
- [Fox Maple School of Traditional Building](#) Brownfield, Maine.
- [Heartwood School](#)



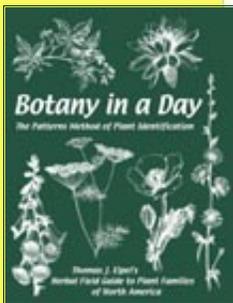
[Direct Pointing to Real Wealth](#)



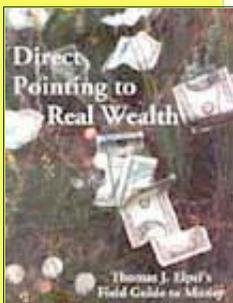
[Living Homes](#)



[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)

Earth Construction: Rammed Earth, Ceramic, Earthbag, Cob, Cast Earth, Adobe & Mudbrick Links

- [David Easton's Rammed Earth Works](#)
- [Ramseal International: Products and Repairs for Rammed Earth and Terra Tiles](#)
- [Rammed Earth Construction with Photos](#)
- [Micander Rammed Earth Construction-Good Photos](#)
- [Burlington Construction, Inc.-Good Photos & Text](#)
- [Kindred Rammed Earth, Inc.](#)
- [California Institute of Earth Art and Architecture -- Earthbag Construction](#)
- [Cob Email List-Server](#)
- [New Mexico Adobe and Rammed Earth Building-Code](#)
- [Earth Building Foundation, Inc.-Rammed Earth Technical Information](#)
- [Kindred Rammed Earth, Inc.](#)
- [Moladi Snap together, reusable forms](#)
- [Rammed Earth Construction-Australia](#)
- [Mud Brick Construction-Australia](#)

Earth Construction: Rammed Earth, Ceramic, Earthbag and Cob Books & Videos

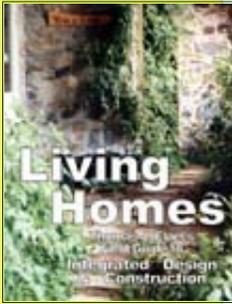
- [The Rammed Earth House](#) - by David Easton and Cynthia Wright
- [The Rammed Earth Renaissance \(Video\)](#) - by David Easton and Cynthia Wright
- [Building with Earth and Straw](#) - by Bruce King, P.E.
- [Ceramic Houses and Earth Architecture](#) - by Nader Khalili
- [Building with Earth](#) - by Paulina Wojciechowska
- [Cob Builders Handbook](#) - by Becky Bee
- [The Hand-Sculpted House](#) - by Ianto Evans, Michael G. Smith, and Linda Smiley

Earth Construction: Rammed Earth, Ceramic, Earthbag, Cob, Cast Earth, Adobe & Mudbrick Schools

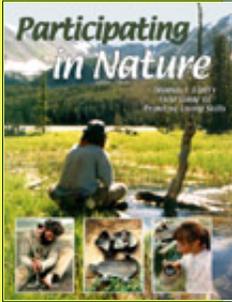
- [Kleiwerks: Cob, Slipstraw, Earth Plaster, Bamboo](#)

Earthship Links

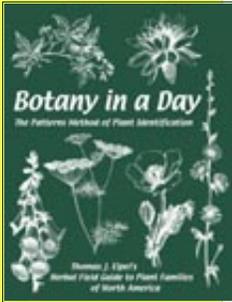
- [Earthship Bioteecture-resources, designs, and workshops](#)
- [Earthships: Useful Overview](#)
- [Earthships Landing: Pictures](#)
- [Another Earthship Landing: Pictures](#)
- [Earthship Lane](#)
- [Allen and Pat Gooch's Earthship \(New Mexico\)](#)
- [Dennis and Gerry Weaver's Earthship \(Colorado\)](#)
- [3rd Millennium Construction Society \(B.C., Canada\)](#)



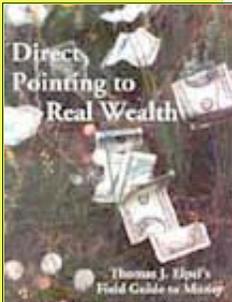
[Living Homes](#)



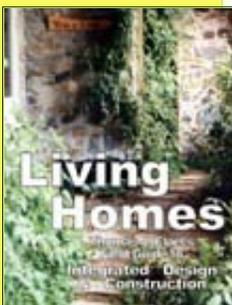
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

- [Vic Cook's Giant Earthship \(Indiana\)](#)

Earthship Books Available Through Amazon.com

- [Earthship: How to Build Your Own](#) - by Michael E. Reynolds

Dome Housing Links

- [Monolithic Domes](#)
- [BioHome](#) Foam insulated biosphere-type homes.

Insulation Alternatives

- [Good Shepherd Wool Insulation](#)
- [Air Krete-Cementitious Foam Insulation](#)
- [The Association for Better Insulation](#)
- [New & Alternative Insulation Materials and Products](#)

Masonry Stove Resouces

- [Masonry Heater Association](#)
- [Temp-Cast Masonry Heaters](#)
- [Maine Wood Heat Co., Inc.](#) - Masonry Stove Kits and Plans
- [Peter Moore Masonry, Inc.](#) - Contractor in Vermont
- [Consumer Energy Information Briefs: Masonry Heaters](#)

Masonry Stove Books from Our Home-Builder's Store:

- [Masonry Stoves: A Brief Overview](#)
- [Living Homes: Integrated Design & Construction](#)- by Thomas J. Elpel
- [The Book of Masonry Stoves](#) - by David Lyle

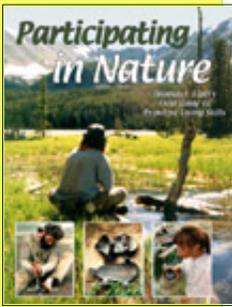


How to Place Retail Orders

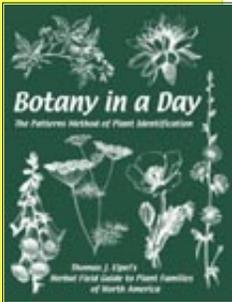
Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684

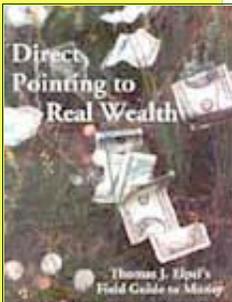
406-287-3605
E-mail Contact Page



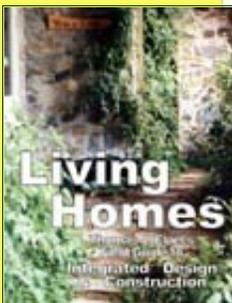
Participating in Nature



Botany in a Day



Direct Pointing
to Real Wealth



Living Homes

Thomas J. Elpel's Web World Portal
Granny's Country Store
HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

Granny's Country Store Departments
Tom's Books & Videos
Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids

**Granny's
COUNTRY STORE
SILVER STAR, MT**

PO Box 684
Silver Star, MT 59751
406-287-3605

**Thomas J. Elpel's
Web World Portal**



Granny's Country Store

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

- Tom's Journals
- Skills Articles
- Directory of Schools

Sustainable Living

- Alternative Construction
- House-Building Classes
- Articles & Resources
- Ecological Economics

Wildflowers & Weeds

- Plant Identification
& Edible Plants
- Rangeland Ecology
- Weed Control Alternatives

Society of

Primitive Technology

- Bulletin of Primitive
Technology
- On-line Articles
- Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

**Granny's
Country Store**

PO Box 684
Silver Star, MT 59751-0684



Green Goods for the Home

Updated January 21st, 2004

Click on any link to learn more about the product.
Most items ship within 24 - 48 hours...
except when we are out in the woods for a few days!
Take a look at our [Environmental Record](#) in business.

This part of our store will be active November 2004.

Until then, please visit our other departments:

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#)

[Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#)

[Books & Gifts for Kids](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

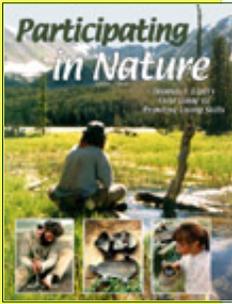
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

406-287-3605
E-mail Contact Page

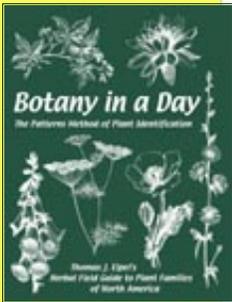


This Website Created on a lovable
Macintosh computer!

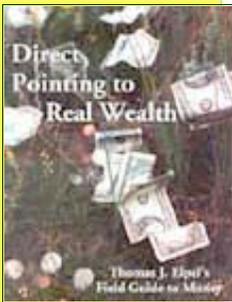
Books authored by
Thomas J. Elpel



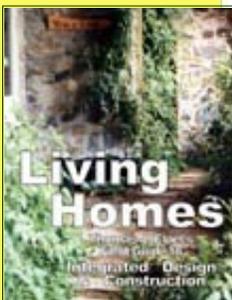
Participating in Nature



Botany in a Day



Direct Pointing
to Real Wealth



Living Homes

Thomas J. Elpel's Web World Portal
Granny's Country Store
HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

Granny's Country Store Departments
Tom's Books & Videos
Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids

Granny's
COUNTRY STORE
SILVER STAR, MT

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor
Primitive School, LLC

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

Granny's
Country Store

PO Box 684
Silver Star, MT 59751-0684



Granny's
Country Store
www.GrannysStore.com

Unique Books & Gifts for Kids

Updated January 21st, 2004

Click on any link to learn more about the product.

Most items ship within 24 - 48 hours....

except when we are out in the woods for a few days!

Take a look at our [Environmental Record](#) in business.

Unique Books & Gifts for Kids

[-Peek-a-Boo Pillows](#) *Hand-crafted in the USA.*

[-Miranda & Starlight](#) *Stories for young readers.*

[-Flint & Steel Kits](#) *Fire-Starters from our Primitive Store*

[-Ingwe](#) *A great story for junior high readers.*

[-Hatchet](#) *A great story for junior high readers*

[-Recycled Plastic Ocarinas](#) *A portable music maker.*

[-The Stars](#) *A great first-guide to the night sky.*



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

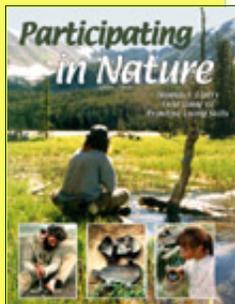
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

406-287-3605
[E-mail Contact Page](#)

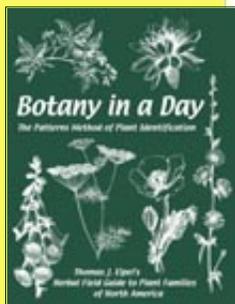


This Website Created on a lovable
Macintosh computer!

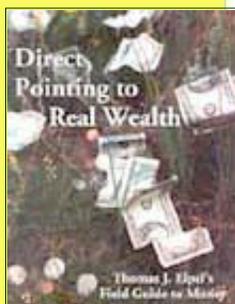
Books authored by
Thomas J. Elpel



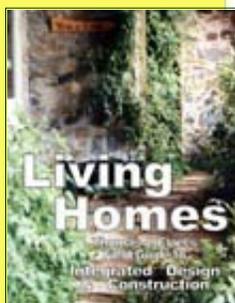
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



HOPS Press, LLC

**Thomas J. Elpel's
Web World Portal**



Granny's Country Store

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

**Granny's
Country Store**



Mariposa Lily
From The Wild Flowers
of California, 1927

HOPS Press, LLC
www.hopspress.com



Illustration by
Roger J. Yaezle
© 1988

HOPS Press, LLC

-Changing the way people learn about nature.-

[Click Here for our Self-Service Instant Wholesale Discount Center](#)

Go to [Books & Videos by Thomas J. Elpel.](#)

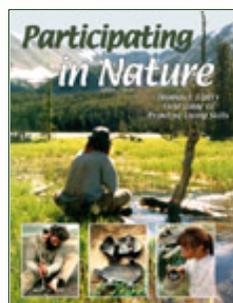


A Positive Relationship with Nature

Our culture teaches us that we are separate from nature. We spend most of our lives in houses surrounded by manicured lawns, living in towns or cities where recreational activities are based on human-centered sports. Nature is something we go to a park to see, or we watch a show about it on TV.

Those of us in the field of environmental education try to preach a different message, telling people that "all life is interconnected" and that "we really are part of nature". But in the next breath we tell them to stay on the trails and to practice "no-trace" camping. We tell them to look at nature and photograph it, but not to touch it. We tell them our modern way of life is destroying nature, and that we need to stop mucking up the planet. In other words, we tell them we are part of nature--the bad part!

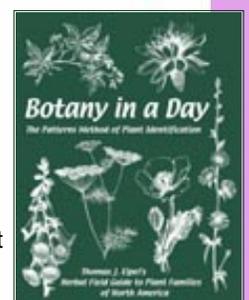
Here at HOPS Press, LLC we advocate a *positive interactive relationship* with the natural world. We want people to get involved in nature, to be a part of the process on many levels:



Through **Participating in Nature: Thomas J. Elpel's Field Guide to Primitive Living Skills** and the Art of Nothing Wilderness

Survival Video Series, you can experience an intimate connection with nature as you rediscover the skills our ancestors used to survive for tens of thousands of years. Instead of merely camping in the wilderness or passing through it, you will become part of the process as you learn about nature by using it to meet your needs for shelter, fire, water and food. Learn to set aside the trappings of modern culture and step directly into nature with little or nothing, to experience nature on its own terms.

With Tom's book **Botany in a Day: The Patterns Method of Plant Identification**, you can connect with the wonderful diversity of plants and flowers all around you in a way that you may have never imagined. Instead of seeing the green world as little more than pretty wallpaper, you will learn to know the individual plants, wildflowers and weeds as if they have been your life-long friends. Our book *Shanleya's Quest: Botany Stories for Children Ages 9-99* (due out in June 2004) utilizes the same patterns method of identifying plants as Botany in a Day, but in a metaphorical story form where children of all ages can join young Shanleya on her journey to learn the plant traditions of her

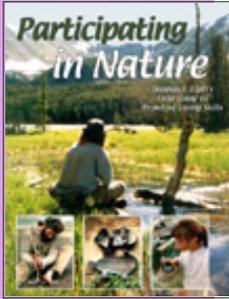


PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

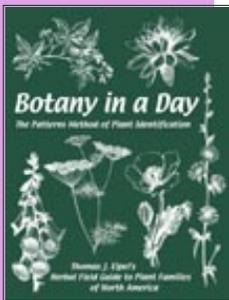


This Website Created on a lovable
[Macintosh](#) computer!

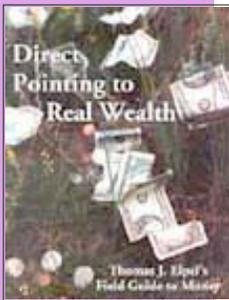
Books authored by
Thomas J. Elpel



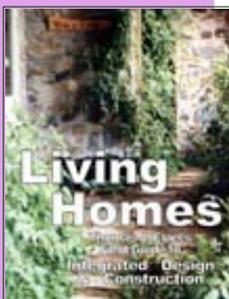
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

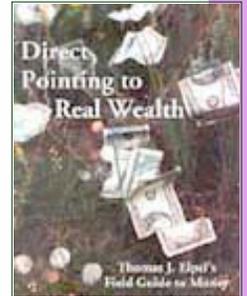
people.



In [Living Homes: Thomas J. Elpel's Field Guide to Integrated Design & Construction](#) you will learn how to make your home part of nature, as well as how to make nature part of your home. Learn the secrets to building low-cost, high-efficiency homes with stone masonry, log-building and strawbale construction methods. With this book and The Art of Slipform Stone Masonry Video you will be able to build your quality, earth-friendly Dream home on a budget, even while the "experts" say it isn't cost effective.

Finally, in [Direct Pointing to Real Wealth: Thomas J. Elpel's Field Guide to Money](#),

you will learn to see the economy as an ecosystem where money is a token that represents calories of energy. Learn the basic rules of this economic ecosystem and you will be empowered to use your resources to more effectively achieve your desired quality of life, while making the world a better place to be. You will be able help convert an economy that harms planetary biodiversity into an economy that helps restore it.



Related topics

Read [Nature as Wallpaper](#) by Thomas J. Elpel.

Also check out our [Environmental Record](#) in Business.

Go to [Books & Videos by Thomas J. Elpel.](#)



How to Place Retail Orders

[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684

Silver Star, MT 59751-0684

406-287-3605

E-mail Contact Page

Thomas J. Elpel's Web World Portal

Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids



Hollowtop Outdoor
Primitive School, LLC **Thomas J.**

Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

**Granny's
Country Store**



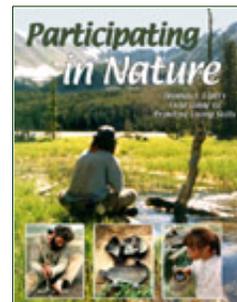
**Thomas J. Elpel's
Hollowtop Outdoor Primitive School, LLC**

Primitive Living Skills Home Page

"Primitive living is a metaphor we participate in and act out. Life is simplified down to the bare essentials: physical and mental well-being, shelter, warmth, clothing, water, and food. We go on an expedition to meet those needs with little more than our bare hands.

"In our quest we learn to observe, to think, to reach inside ourselves for new resources for dealing with challenging and unfamiliar situations. We build up our personal strengths, and at the same time we interact with and learn about the world around us.

"In a story we can only join a quest in our imaginations. But in primitive living, we physically leave the contemporary world. We journey into the world of stone-age skills, and we return with knowledge, wisdom, and strength to enrich our lives in contemporary society."



--Thomas J. Elpel, Author
Participating in Nature

More About HOPS

Last Updated January 25th, 2004

**Updated! Primitive Living Skills Schedule
Classes with Thomas J. Elpel**

**Primitive Living Store
- Books - Videos - Tools -**

**Access to Schools, Classes & Gatherings
On-Line Calendar of Schools**

Directory of Primitive Living & Nature Awareness Schools

Directory of Schools in Europe

Directory of Primitive Skills Gatherings

Primitive Living FAQ's

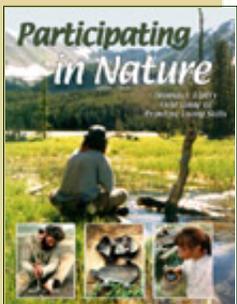
Tom's Camping Journals [Harrison School 8th Grade Camping Trip](#)

**PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)**

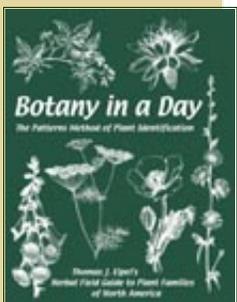


This Website Created on a lovable **Macintosh** computer!

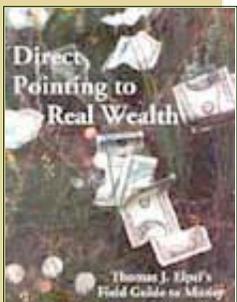
Books authored by
Thomas J. Elpel



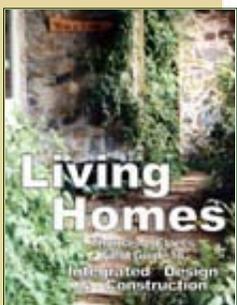
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

(May 15th - 16th, 2003)

[Jefferson River Walk](#)
(August 29th - September 3rd, 2001)

[Jefferson River Canoe Trip](#)
(May 14-21, 2001)

[A Wildlife Sanctuary in the Land of Cold](#)
(November 30 - December 4, 2000)

[Camping with the Kids](#)
(October 19-21, 2000)

[Missouri River Canoe Trip](#)
(July 2-14, 2000)

[Missouri Moonlight](#)
(February 17-22, 2000)

[Tobacco Roots Trek II](#)
(September 28-October 2, 1999)

[Green River Canoe Trip](#)
(July 1-14, 1999)

[A Father-Daughter Camp-Out](#)
(February 27-28, 1999)

[Island in the Sky](#)
(September 29-30 1998)

[Tobacco Roots Trek](#)
(September 1-6 1998)



Primitive Skills & Awareness Articles by Thomas J. Elpel

[Primitive Living as Metaphor](#)

[Tire Sandals](#)

[The Atlatl and Dart](#)

[Artifacts & Ethics](#)

[The Art of Nothing](#)

[Bear Summer](#)

NEW! [Nature as Wallpaper](#)

[Some Thoughts on Awareness](#)

Other Articles and Items of Interest

[Eat Bugs! Visit the Food Insects Newsletter](#)

[Primitive Living Skills Links](#)

[Making Horsetail Pan Flute](#)

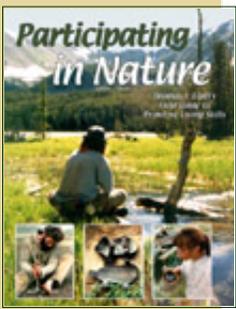
[The Quartz Crystal Handdrill](#)

[A Friction Fire Inquiry: Bow Drill \(752K\)](#)

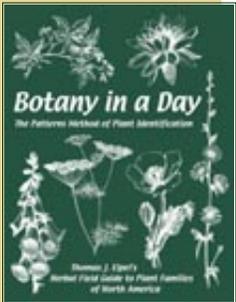
[Storytelling: Painting Pictures With Your Tongue](#)

Hello,

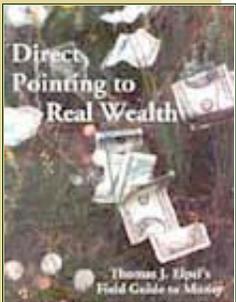
Two weeks ago I received your book [Participating in Nature](#). I have already read it 4 times and each time I find something new. This book is a wonderful guide to living the type of life I would like to live. I don't mean that I am interested in living through stoneage technology but I am interested in becoming more knowledgeable about nature and my interaction with it. I find myself hungry for more and thus have ordered



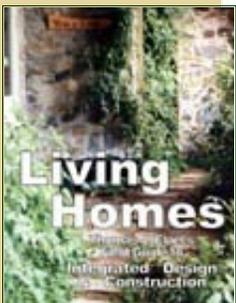
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

two more of your books. I was very happy to discover that your books are more than just "how-to". I find the use of story intertwined with skills puts things in context and makes for a richer learning experience and one that is easy to remember. I am looking forward to reading your next books!

*-- Michael M.
living in Japan
(used with permission)*



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



**Thomas J. Elpel's
Web World Portal**



Granny's Country Store

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

- [Tom's Journals](#)
- [Skills Articles](#)
- [Directory of Schools](#)

Sustainable Living

- [Alternative Construction](#)
- [House-Building Classes](#)
- [Articles & Resources](#)
- [Ecological Economics](#)

Wildflowers & Weeds

- [Plant Identification
& Edible Plants](#)
- [Rangeland Ecology](#)
- [Weed Control Alternatives](#)

Society of

Primitive Technology

- [Bulletin of Primitive
Technology](#)
- [On-line Articles](#)
- [Subscription Information](#)

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

**Granny's
Country Store**

PO Box 684
Silver Star, MT 59751-0684

Thomas J. Elpel's

Hollowtop Outdoor Primitive School, LLC

--Sustainable Living Skills Home Page--

Last Updated May 24th, 2003

"Prosperity in the 21st century belongs to those who seek profit in making the world a better place. Ecopreneurs will out-compete inefficient, abusive industries by starting green businesses that close the loop on wasted materials, energy, time, money and labor. They will heal wasted ecosystems and restore bio-diversity at a profit while delivering useful goods and services to the public. Home-owners too, will profit by seeking ways to eliminate everything from high energy bills to mortgage payments--even eliminating the need for a regular job. But there is no need to wait for such a future to come, for the revolution has already started. The door is wide open, and anyone can walk the path to green prosperity, changing the world every step along the way."



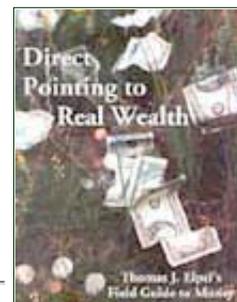
photos by Will Brewster

**--Thomas J. Elpel, author of
Direct Pointing to Real Wealth
and**

Living Homes: Integrated Design & Construction

Economics & Ecology Articles by Thomas J. Elpel:

- [ESCAPING THE JOB TRAP: It's a Matter of Time, NOT Money!](#)
- [Calories: The Currency of All Economies](#)
- [Wealth & Work: A Ten Thousand Year-Old Pattern](#)
- [Carbon Dioxide Quiz](#)
- [The Most Important Ideas of the New Millenium](#)

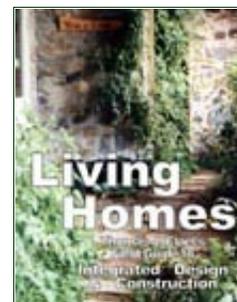


House-Building Articles and Resources:

- [Building a House on Limited Means](#)
- [NEW! We've Gone Solar!](#)

Stone Masonry Construction Articles and Resources

- [Stone Masonry Construction and Resources](#)
- [We built a Slipform Stone Workshop](#)
- [A reader builds a Slipform Stone Mansion](#)
- [A reader builds a Wilderness Cabin of Stone](#)
- [Slipform Stone Masonry: Class Information](#)
- [Tilt-up Stone Masonry](#)
- [Living Homes: Integrated Design & Construction](#)
- [The Art of Slipform Stone Masonry Video](#)

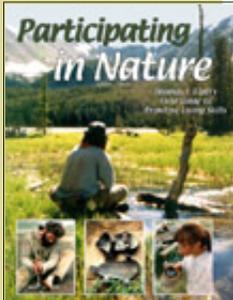


406-287-3605
[E-mail Contact Page](#)

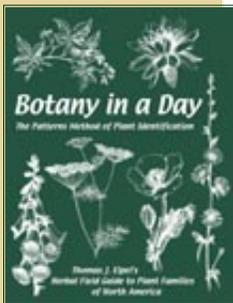


This Website Created on a lovable
[Macintosh](#) computer!

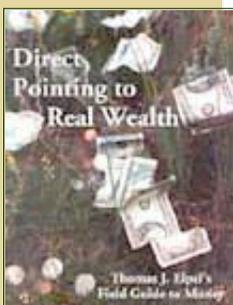
Books authored by
Thomas J. Elpel



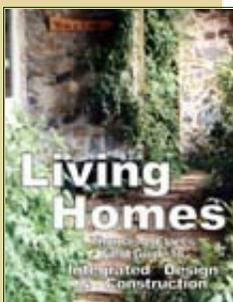
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Log, Timber Frame, Strawbale and Earthen Construction Articles and Resources

- [Log House Construction, Overview and Books](#)
- [Timber Frame Construction Books](#)
- [Strawbale Construction, Overview and Books](#)
- [Earth Construction Books](#)
- [Masonry Stove Overview and Books](#)
- [Terra Tiles](#)
- [Homestead Skills](#)

Question & Answer Pages

- [Questions about Buying Land](#)
- [Questions about Low-Cost Construction](#)
- [Slipform Stone Masonry Questions](#)
- [Tilt-Up Stone Masonry Questions](#)
- [Fireplace & Chimney Questions](#)
- [Log Home Construction Questions](#)
- [Strawbale Construction Questions](#)
- [Home Heating, Insulation & Energy Efficiency Questions](#)
- [Roofing Options Questions](#)

Go to the [Home-Builder's Store](#) for Alternative
Construction Books, Resources, and Schools.

(Stone Masonry, Strawbale Construction, Log Homes
Rammed Earth, Adobe, Papercrete, Earthships and more...)

Looking to buy or sell land in Montana, Wyoming or Idaho?
Check out [American Conservation Real Estate](#)

for a truly ethical approach to the real estate business.

Be sure to watch the introductory movie!

Also check out the [Corporation for the Northern Rockies](#)
and download their *Welcome to the West* guide.

[Other Sustainable Living Skills Links](#)

[More about Hollowtop Outdoor Primitive School, LLC](#)

I've just read your article [Building a House on Limited Means](#), and placed an order for your "Living Homes" book. I can't wait to receive it. My boyfriend, Jim, and I have almost identical aspirations for our own lives (right down to building a house into a hill, heating our water with the warmth of a woodstove, and eliminating the need for a 40hr/week job). Reading your article, I could hardly believe that there was someone out there that had similar dreams, and, better yet, made them come true! I knew it was possible!!

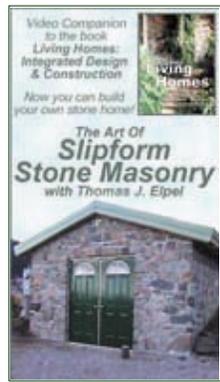
Thanks for the inspiration!!!

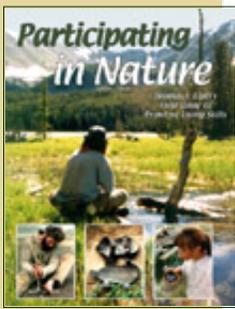
*--Erin Mulcahy
(used with permission)*

Hello-

Just ordered your [Field Guide to Money](#). It is a great book, I tried to get my library to buy it. They let me read a copy from Boise instead.

I've already used some of the principles in this book to get a job at Boulder Hot Springs at Boulder, Montana. I drive over once a month or so, and help them with their Organic food production. I visited Boulder H.S. in April, May and June - helping them learn to grow food in their new





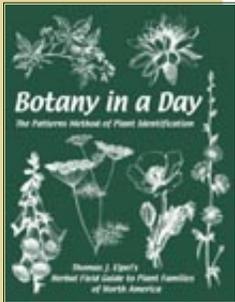
[Participating in Nature](#)

geothermal greenhouse. It's a great job. I utilize your ideas about closing waste loops and Wow! - it works great. Small input and RESULTS! Waste streams are so generous!

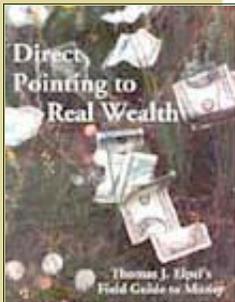
Thank You!

Sincerely,

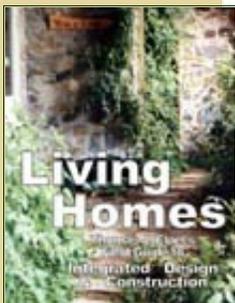
B. Goodrich
Sandpoint, Idaho
(used with permission)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

Thomas J. Elpel's

Wildflowers & Weeds Home Page

Updated January 31st, 2004

Parsley Family Slideshow: Notice the pattern of similarity among these different species of the same family. (If the slideshow doesn't appear then try a newer browser.)

Free DHTML scripts provided by [Dynamic Drive](#)

"Many people are familiar with the square stems and opposite leaves of the plants in the Mint Family. I like to start my classes with a discussion of the the mints because this pattern is so well known.

"What people don't realize is that similar patterns exist for other families of plants as well. You only need to learn about 100 broad patterns to recognize something about virtually every plant from coast to coast across the northern latitudes.

"In a two hour plant walk we typically start with the Mint Family, then progress through the Mustard, Pea, Parsley, Borage, Lily, and Aster Families, so that every student can easily recognize these common families representing several thousand species.

"I've had people tell me they learned more in that two hour walk than in an entire semester of botany in college."

--Thomas J. Elpel, Author
[Botany in a Day](#)



Wildflowers and Weeds

Thomas J. Elpel's
[Web World Portal](#)



Granny's Country Store

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

Wildflowers & Weeds Store [Plant Identification & Ecology Resources](#)

Updated! Now with 500+ pictures on-line.

Wildflower Photo Gallery [Identify your Wildflowers!](#)

Want to learn to identify 45,000 plants today?
Be sure to read my on-line article
[Learning to Identify Plants by Families](#)

Join an [On-Line Discussion](#) of Botany in a Day

Wild Edible Plants
[Forager's Harvest: Wild Foods Newsletter](#)
[Edible Wild Plants Questions & Answers](#)

Mushroom Photo Gallery
[A photo album of mushrooms I have found.](#)

Desertification and Noxious Weeds

[What is a Weed? What is a Noxious Weed?](#)
[Why Should we be Concerned About Noxious Weeds?](#)
[Is There Any Hope?](#)

The American Sahara



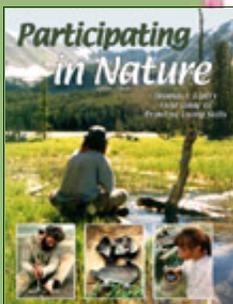
Granny's Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

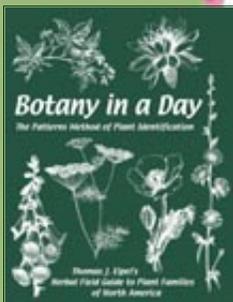


This Website Created on a lovable **Macintosh** computer!

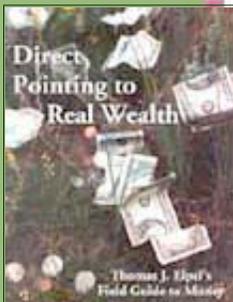
Books authored by
Thomas J. Elpel



[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)

--The New Desert Beneath Our Feet--
[Brittle and Non-Brittle Environments](#)
[Succession in Brittle Environments](#)
[Weed Control by Grazing with Sheep](#)
[Weed Control by Trampling with Horses](#)
[Desertification News Briefs](#)

Weeds You Should Know **Profiles of Invasive Weeds**



Jennifer and Frieda cuddle with a woolly weed eater.

The Pony Millsite **A Disaster We Could Have Prevented**

Wildflowers & Weeds Links

Dear Tom,

My husband brought me a copy of Botany in a Day and I wish I'd had it when I started my love affair with wild plants! (Of course, you weren't born yet...) This is THE best-laid-out teaching guide to plants I have ever seen, and my library of botanical texts is in the 100's! I plan to use it as a textbook for serious students of botany.

I wish we had something equivalent for Missouri, although your estimate of 75% species occurrence of western species in Missouri is quite valid. We are quite the ecosystem-crossroads here! Steyermark's Flora of Missouri is wonderful but enormous and unwieldy, and our Dept. of Conservation and Dept. of Natural Resources folks have good general field guides for beginners. But your book is outstanding! Keep up the excellent work!

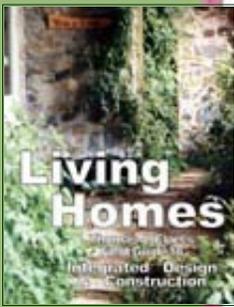
*Most sincerely,
Laurie Lovell, aka Wild Plant Woman
(used with permission)*

Thomas J. Elpel's Web World Portal
Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

Granny's Country Store Departments
Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids



Living Homes



The Society of Primitive Technology

Updated January 1st, 2004

Society of Primitive
Technology
PO Box 905
Rexburg, ID 83440
208-359-2400
dwescot@aol.com

[Subscribe & Order Back Issues On-Line!](#)

[--2004 Winter Count & Rabbitstick Information--](#)

The Society of Primitive Technology is a non-profit organization dedicated to the research, practice, and teaching of primitive technology.

What's inside the **[Current Issue](#)** of the Bulletin?

Browse the Contents of our Back Issues

[Issues #1-10](#) | **[Issues #11-current](#)**

Check out these On-Line Articles

- **[The Fire Plow](#)** by Bart & Robin Blankenship
- **[Conquering the Darkness](#)** by Benjamin Pressley
- **[Card Weaving](#)** by Bart & Robin Blankenship
- **[The Art of Nothing](#)** by Thomas J. Elpel
- **[Metaphors for Living](#)** by Thomas J. Elpel
- **[Artifacts & Ethics](#)** by Thomas J. Elpel
- **[Atlatl Weights](#)** by "Atlatl Bob" Perkins
- **[Stealth Technology 1992 B.C.](#)** by "Atlatl Bob" Perkins
- **[Nature as Wallpaper](#)** by Thomas J. Elpel

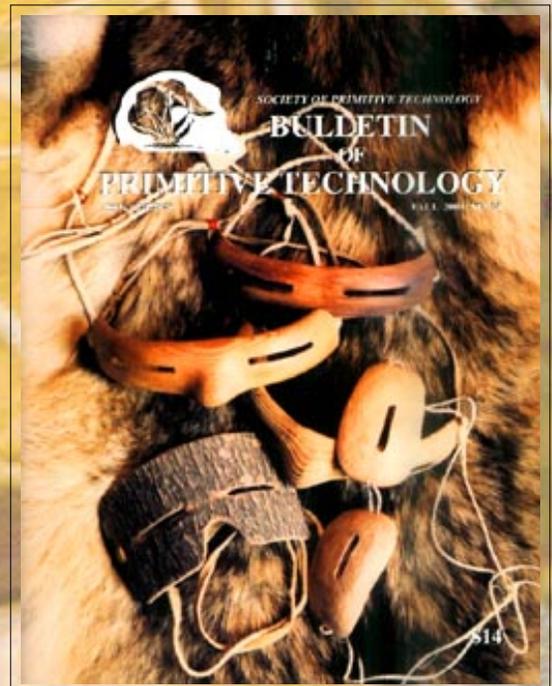
Now Available!

[Primitive Technology: A Book of Earth Skills](#)

-&-

[Primitive Technology II: Ancestral Skills](#)

-Featuring the best of the Bulletin of Primitive Technology!-



Other Items of Interest

An Interview with **[Larry Dean Olsen and Tom Brown Jr.](#)**

Check out the

[On-Line Calendar of Schools](#)

and be sure to visit the

[Directory of Primitive Living & Nature Awareness Schools](#)

The SPT website is maintained courtesy of Thomas J. Elpel. Please visit our **[Webworld Portal](#)**

Granny's
COUNTRY STORE
SILVER STAR, MT

[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#)
[Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#)
[Green Goods for the Home](#)
[Books & Gifts for Kids](#)



HOPS Press

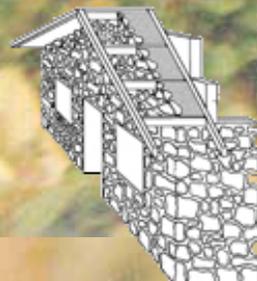


Hollowtop Outdoor Primitive School

**3 Rivers
Park**



**Wildflowers
& Weeds**



**Sustainable
Living Skills**

[Thomas J. Elpel's Web World Portal](#)
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

[Granny's Country Store Departments](#)
[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

3Rivers Park

3Rivers Park **Thomas J. Elpel's**
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor
Primitive School, LLC
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

Granny's Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
E-mail Contact Page



3Rivers Park

Canoeing, Rafting, Fishing
Hiking, Bicycling, Horseback Riding
Hunting, Camping, Bird Watching, Wildlife Viewing

-A Place for People-

Updated April 8th, 2003

At 3Rivers Park, our mission is to work with private land owners to increase public access along the rivers while preserving open space and productivity in the surrounding farms and ranches. The primary focus of our work is in finding creative ways to purchase recreational and open space easements from willing sellers. Recreational easements thus acquired are to be managed by 3Rivers Park for sustainable use by the public.

A Vision for the Future

Perspective from Thomas J. Elpel

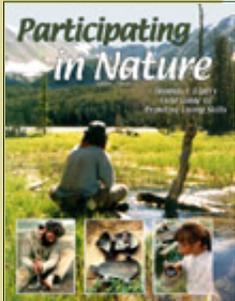
My parents were both native to Montana. Every summer they brought us kids back here to be close to the extended family. For those three months each year we were constantly out hiking, fishing, picnicking, camping, and occasionally floating. There were no real boundaries at that time. Public and private lands flowed seamlessly together through fields, across hills, and down rivers. Montana was a wonderland where it seemed that you could hike or fish or camp just about anywhere and private property was not an issue, as long as you didn't abuse it.

Our family moved back to Montana full time when I was twelve. In junior high and high school in Bozeman I spent much of my free time out exploring the local farm fields. Through the growing season I learned to identify wild plants and collected

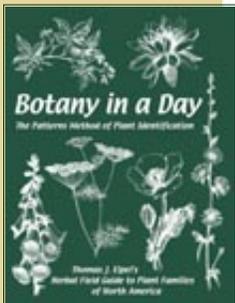


This Website Created on a lovable **Macintosh** computer!

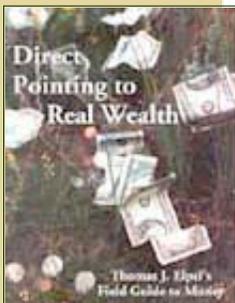
Books authored by **Thomas J. Elpel**



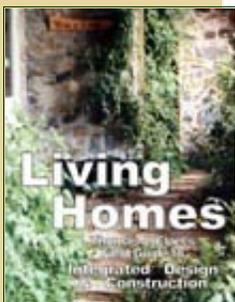
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

edible greens and berries. I practiced my stalking skills on the local deer just for the thrill of watching them. Through the winter I skied those same fields and tracked the deer, rabbits, foxes and skunks where ever they went. But Montana has changed since then.

The first "No Trespassing" signs were a disconcerting novelty. The first subdivisions on prime farm fields were an even greater shock and an outrage. But that was just the beginning of a shockwave that spread across southwest Montana, sprouting signs and subdivisions up like mushrooms in the strangest of places. It became impossible to predict when or where the next one would pop up.



But what we have seen so far is just the "tip of the iceberg" compared to what is coming. We can reasonably expect to witness a population explosion across the region from about 100,000 people today to more than a million later this century. While it is true that we cannot turn back the clock to what once was, at least we can give forethought to creating a more desirable future.

I would like to see the children of all generations have the opportunity to leave the television and video games behind, to get out and explore the natural wonders that surround us. Unfortunately, it is difficult for kids or families to get out when the surrounding wild niches are developed into little ranchettes or locked away behind "No Trespassing" signs. Existing public lands are too far away for easy access after school, and winter snows reduce access even more for non-skiers. What we especially need is access to wild places in the heart of the valleys where people can recreate and enjoy the Montana outdoors at any time of the year.

Our rivers, the Gallatin, the Madison, and the Jefferson, are the greatest corridors of wildness through the valleys, and the logical choice for an accessible recreational park. 3Rivers Park is our vision to create a better tomorrow for this special part of the world, to insure that the future will be a fun place to live for our children and our children's children.

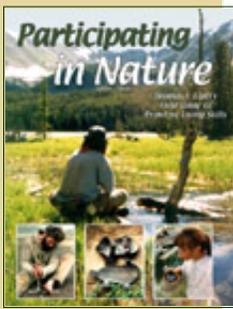
Clearly it will take more than our lifetimes to complete the park, but it is our goal to purchase open space and recreational easements along these great rivers, piece by piece as they become available from willing sellers. It is our vision that the park will one day encompass the entire length of the Jefferson, Madison, and Gallatin Rivers outside of federal lands.

While we have great Dreams for 3Rivers Park, we are a fledgling organization, just getting started. If you have the inspiration, time or money to contribute to this Vision, then let's work together! We can be reached at:

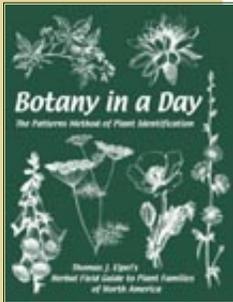
3riverspark.org
PO Box 697
Pony, MT 59747-0697
Vision2100@3riverspark.org

[Join our On-Line Discussion Group](#)

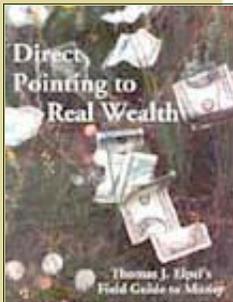
Useful Resources



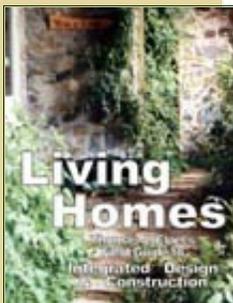
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

[NEW! Maps of the Project Area](#)
[Directory of Land Trusts Operating in Montana](#)

3Rivers Park Documents
[Articles of Incorporation](#) & [By-Laws](#)

[Thomas J. Elpel's Web World Portal](#)
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

[Granny's Country Store Departments](#)
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



Hollowtop Outdoor
Primitive School, LLC **Thomas J.**

Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

**Granny's
Country Store**



**Thomas J. Elpel's
Hollowtop Outdoor Primitive School, LLC**

What's New on all our websites?

I hear that many of you return again and again to check out what's new on our websites. So I am now listing updates here for easy access. Updates are kept on this page for approximately one year. Thanks for stopping by!

February 2004

What's New?

An Easier Way to Identify Plants

a short article with recommend resources, including botanical loupes and new book titles.

Also check out the updated class listings on the

On-Line Calendar of Schools

(The summer months are especially loaded with classes.)

January 2004

What's New?

We built a website for **HOPS Press, LLC**

and completed the integration of **Granny's Country Store**

and we released the completely revised 5th Edition of
Botany in a Day: The Patterns Method of Plant Identification

December 2003

What's New on Wildflowers-and-Weeds.com:

200 New Wildflower Photos!

(That brings the total to about 500 pictures.)

What's New on the Primitive Living Skills Page:

2004 Class Schedule (first draft)

September 2003

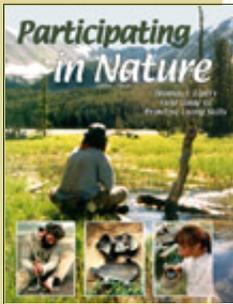
We bought a store! For years we ran our business out of our house. But as the business grew and grew it started to run *us* out of the house. We finally bought a retail store, called **Granny's Country Store** in the nearby town of Silver Star,

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

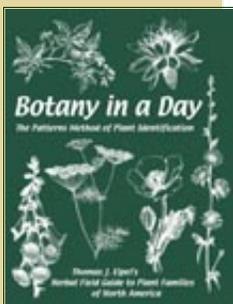


This Website Created on a lovable
[Macintosh](#) computer!

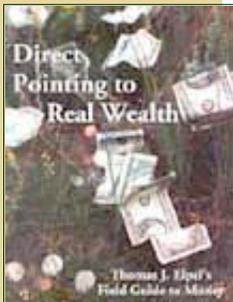
Books authored by
Thomas J. Elpel



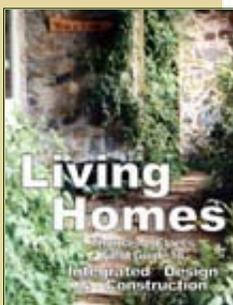
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



[Living Homes](#)

Montana. We moved in over Labor Day weekend, and we are now processing and shipping all orders from the store. Since we liked the name "Granny's Country Store", we decided to adopt the new name for our bookstore, so look for a few changes to come to the website over the winter. The new location will also allow us to offer an expanded [class schedule](#).

What's New in the Primitive Living Store:
[NEW! -Volume 3 in the Art of Nothing Video Series](#)
[Mountain Lakes: a survival fishing trip](#)

August 2003
What's New in the Wildflowers Store:
[NEW! -Why Grassfed is Best!](#) by Jo Robinson
[NEW! -Salad Bar Beef](#) by Joel Salatin

July 2003
What's New in the Primitive Living Skills Store:
[NEW! -Soto! Fire Plow Fire Sets!](#)
[NEW! -Welcome Back to the Stone Age](#) Video with Woody Blackell

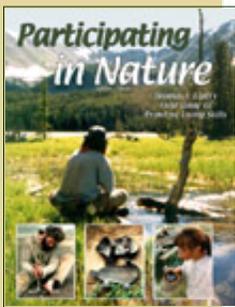
What's New on the Primitive Living Skills Page:
[NEW! -Three Primitive Skills Articles by Storm](#)

June 2003
What's New on the Primitive Living Skills Page:
[NEW! Harrison School 8th Grade Camping Trip](#)
["-Return to the River-"](#)

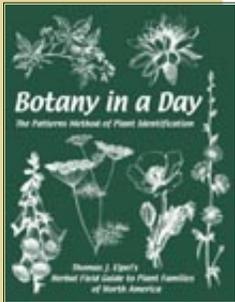
May 2003
What's New on the Sustainable Living Skills Page:
[NEW! -We've Gone Solar!](#) [NEW! -Lots of Home-Building Question and Answer Pages!](#)

04-03-2003
What's New for April:
[NEW! -Iodine Crystals for water purification](#)

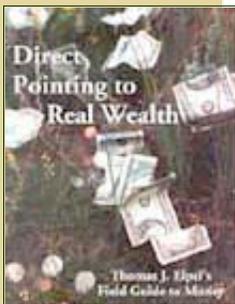
03-06-2003
What's New for March:
[NEW! -Genuine Braintan Buckskin](#)
[NEW! -More Home-Building Books, plus Question & Answer pages](#)
[NEW! -Canoe Craft: Woodstrip Construction](#) by Ted Moores
[NEW! -Exploring Common Useful Plants of the U.S. \(video\)](#) by Christopher Nyerges



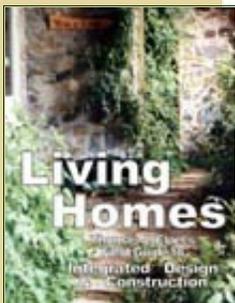
Participating in Nature



Botany in a Day



Direct Pointing to Real Wealth



Living Homes

02-13-2003

What's New for January-February:

NEW! -From Crabgrass Muffins to Pine Needle Tea by Linda Runyon

NEW! -Building a Birchbark Canoe by David Gidmark

NEW! -Indian Fishing by Hilary Stewart

NEW! -Thebes Points & Their Variants Video by D.C. Waldorf

NEW! -Ishi & Elvis by Jim Hamm

NEW! -How to Make Indian Bows and Arrows the Old Way by Douglas Spotted Eagle

NEW! -How to Make Primitive Pottery by Evard Gibby

01-17-2003

What's New for December-January:

-NEW! Barbwire Hearts

-NEW! Dry-Scrape Tools for Hide Tanning

-NEW! Lots of Home-Building Books

-NEW! Genuine Mongolian Gers (yurts)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



The Food Insects Newsletter, Inc.

Florence V. Dunkel, Ph.D., Editor
 Associate Professor, Dept. of Entomology
 333 Leon Johnson Hall, Montana State University
 Bozeman, MT 59717-0302
 ueyfd@montana.edu

-Printable Subscription/Donation Form-

Subscription Information: The Food Insects Newsletter, Inc. is scheduled for publication each year in March, July, and November. Issues are mailed at bulk rate to U.S. addresses and airmailed (first class rate) to non-domestic addresses. To be placed on and remain on the mailing list, a fee of US\$12.00 per year, beginning with Volume 13, is requested to help cover production, printing and distribution costs. Your contributions above the annual US\$12.00 fee may be tax deductible (check with your tax advisor). Active Peace Corps volunteers and public libraries are exempt from the annual fee as are others who notify the Editor that the annual fee poses a problem. Your donations are greatly appreciated to insure the future of FINL. Please Make checks and money orders payable to: *The Food Insects Newsletter, Inc.* and send, along with your name, address, phone, fax, and e-mail to the address above. Sorry, we do not accept credit cards.

Name (please specify Title, Ph.D., M.D., etc.):
Affiliation:
Address (in the USA we must have a street address or P. O. Box number so we can use bulk mail at reduced costs):
City, ST Zip Code / City Province, Mail Code, Country:
Work Phone Number:
Fax Number:
E-mail Address:
Special Interests:
Persons who you think may like to receive a complimentary copy of the Food Insects Newsletter. Please include street or PO Box. Thank you.:
I wish to be listed in the next Food Insects Directory: Y N (please circle one).

Quantity	Description	Unit Cost	Totals
----------	-------------	-----------	--------

	Subscription:	\$12.00/yr.	
	Back Issues Vol. 1-9 (26 issues):	\$40.50	
	Individual Back Issues (Circle each issue you want.)		
	1988 Volume #1: July - #2 November	\$1.50 ea.	
	1989 Volume 2: #1 March - #2 July - #3 November	\$1.50 ea.	
	1990 Volume 3: #1 March - #2 July - #3 November	\$1.50 ea.	
	1991 Volume 4: #1 March - #2 July - #3 November	\$1.50 ea.	
	1992 Volume 5: #1 March - #2 July - #3 November	\$1.50 ea.	
	1993 Volume 6: #1 March - #2 July - #3 November	\$1.50 ea.	
	1994 Volume 7: #1 March - #2 July - #3 November	\$1.50 ea.	
	1995 Volume 8: #1 March - #2 July - #3 November	\$1.50 ea.	
	1996 Volume 9: #1 March - #2 July - #3 November	\$2.00 ea.	
	1997 Volume 10: #1 March - #2 July - #3 November	\$3.50 ea.	
	1998 Volume 11: #1 March - #2 July - #3 November	\$3.50 ea.	
	1999 Volume 12: #1 March - #2 July	\$3.50 ea.	
		Postage:	FREE
		Donation:	
	Please make checks payable to: Food Insects Newsletter, Inc.	Total:	

NOTE: Volume 12, No. 3 (1999), plus all of Volume 13 (2000); Volume 14 (2001) and Volume 15 (2002) are not yet published. There is plenty of publishable material, however, funds are in short supply to print and mail the newsletter. Your donations are greatly appreciated to help keep the issues rolling.

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

The Food Insects Newsletter, Inc.
Florence V. Dunkel, Ph.D., Editor and C.E.O.
Associate Professor, Department of Entomology
324 Leon Johnson Hall
Montana State University
Bozeman, MT 59717-0302 U.S.A.
ueyfd@montana.edu FAX 406.585.5608

February, 1999

The Food Insects Newsletter (FINL) is now a bona fide charitable [501(c)(3)] organization according to the U.S.A. Federal Internal Revenue Service (IRS) and a not-for-profit Montana corporation. This provides tax deductibility, both State and Federal, up to the limit of the tax rules for your individual tax situation, for charitable gifts to the FINL for donors living in the U.S.A. Donors living outside the borders of the U.S.A. will have to discover the tax deductibility of donations according to their own situation. Generally, annual subscription fees should not be considered a tax-deductible item.

Florence and I (her husband) now have a very positive outlook for the long-term viability of the FINL as a result of this IRS ruling. We have been through a long and expensive process to achieve this status. We have re-dedicated ourselves to catching up on long overdue work. For example, I have not deposited subscribers checks for more than nine months unless the check was paying for back issues. I will find a number of you in my stack of "to do's" who are waiting for the ordered issues to arrive. I promise all subscribers that I will be "current" by mid-March 1999 and that I will stay current thereafter.

We are also far behind in publications and mailings. The last issue published was Volume 10, Number 2 (July 1997) which has been mailed to subscribers living in the U.S.A. but not to subscribers outside the borders of the U.S.A. (because I have not deposited checks for a while, our current cash balance is low, but that is why I am now depositing all checks I have in-hand). The "non-domestic" mailing of Volume 10, Number 2, will be made by the middle of March 1999.

Because of financial considerations (lawyers' and accountant's fees used up a lot of publication and mailing funds), Florence and I are planning to publish a "mega issue" and have it in the mail by early July (1999!). With this mega issue, we will consider ourselves as being up-to-date and will then return to three annual issues, the first being November 1999. One big boost to the return to financial viability is the promise of a \$1,000 donation by a Foundation in California whose Board members wish the FINL to continue its valuable work. We are very grateful for this financial support.

If you have any questions, any suggestions, or wish to communicate any concerns, please let us know. Please e-mail me at diggs@montana.campuswix.net or write to or e-mail Florence at one of the addresses on the top of this page. The FAX number prints a FAX at our home. Thank you all for your patience and support.

Sincerely yours,

Robert E. (Bob) Diggs, Assistant Editor,
The Food Insects Newsletter

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Fried Grasshoppers: For Campouts or at Home

March 1998. Volume 11, Issue #1.

by Charles Griffith, M.S. Retired Clinical Psychologist; Private Consultant. Ozark, Arkansas 72949-8810

Editor's note: The following was sent to us as a Letter to the Editor. We thought many of you would be interested in Mr. Griffith's insights and so are including his entire communication unedited.

Having been an edible wild plant enthusiast for years, my wife and I taught classes on the subject at both Yellowstone Park where we worked for three summers in the mid-eighties and in Colorado. Our most recent classes (three successive summers) have been under the auspices of the Colorado Mountain College Rendezvous (a re-enactment of the trappers' rendezvous that were held in the Rocky Mountains between 1810 and 1840). These events are held each summer in August, usually in one of the National Forests near Fairplay, Colorado, and sponsored by the Colorado Black Powder Association.

Often students want to know if one can survive on wild edible plants alone in an emergency situation. Since I have never attempted a survival experiment, I have not been able to definitively answer that question, but the more I think about the question the more inclined I am to believe that more protein and fat would need to be a part of a survival diet and thus plants alone would probably not be enough--especially in the Rocky Mountain west where even Euell Gibbons found meager pickings. Plants might sustain someone in the short run a few days or a week or two at most, but it seems that some harvest from the animal kingdom would eventually have to be a part of the survival diet mix unless lots of nuts were available (sorry about that, vegetarians).

In almost all of Gibbons' "wild parties" and survival outings, he included items from the "fauna" category such as fish, crayfish and other seafood, frog legs, game fowl, and some outright "varmints," such as an unlucky porcupine he found wandering out in the Colorado wilderness on one of his adventure trips. Although Gibbons never spoke much of hunting game, as such, he certainly seemed to have the knowledge and skill to quickly take advantage of a wandering member of the animal world. Although a porcupine is not a difficult animal to kill, he would probably have to have some knowledge of skinning and dressing the animal.

Recently, we found the recipe in a popular outdoor magazine from the early 1990s. It was a recipe for fried grasshoppers that was so good that we'd like to pass it along. It seems that grasshoppers are plentiful enough that in a pinch, they might be able to provide the protein portion of a survival diet, if a person can get over any "insect as a food" prejudice from which we, too, have been victim. We had been trying to work up to eating an insect

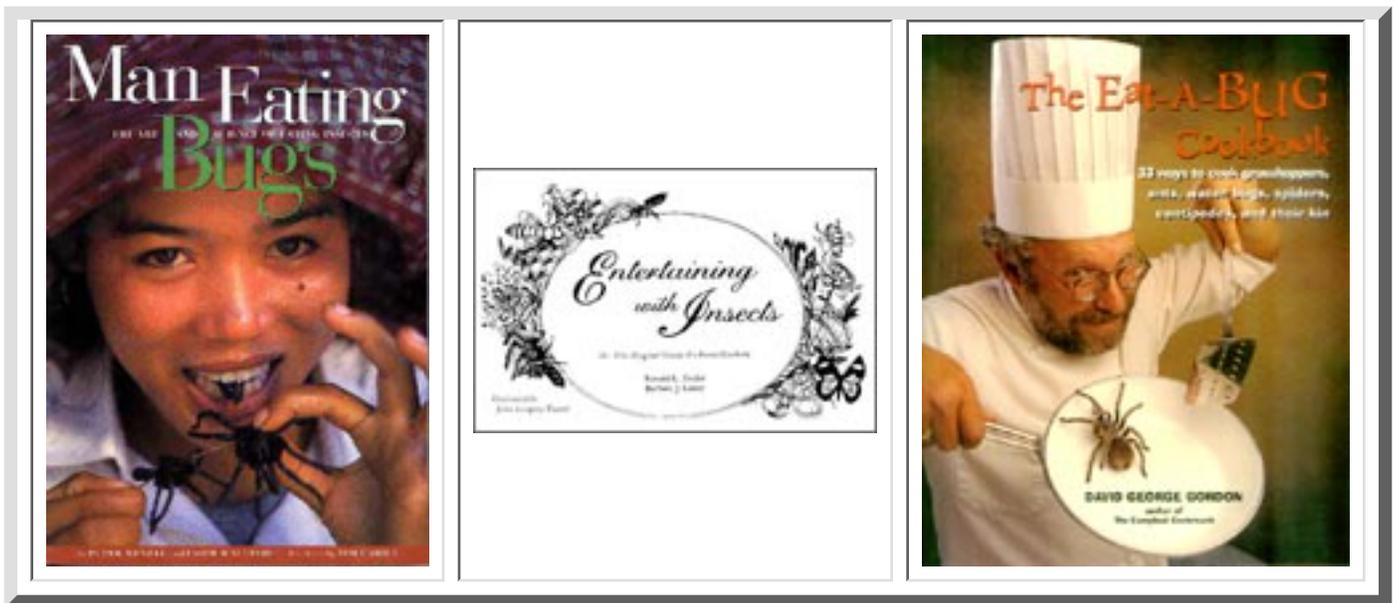
for years. Finally, we gave in to grasshoppers. "Pretty good!" And they are certainly plentiful during a large part of the year and fairly easy to catch--another advantage.

First, catch a bunch of grasshoppers and leave them in a jar overnight to purge (if you're finicky). Then boil them for ten minutes, after which you can easily remove the large legs, and wings, too, if they are also large.

Next, in a bowl, beat one or more eggs, depending on how many grasshoppers you have, to which you add the little critters after removing the legs and wings. Then put the beaten-egg-covered "hoppers" in a paper sack or plastic bag which contains some yellow or white cornmeal and shake. Next, place the egg and cornmeal-covered grasshoppers one by-one into a small frying pan with an inch (2.54 cm) of hot cooking oil and fry until golden brown. After cooking, remove the hoppers from the skillet and place them on paper towels - to soak up any excess oil. Our family experimented by eating them plain, and dipped in mustard, catsup, horseradish, or honey. We could have tried lots of other dips, too, I suppose. We liked them best with honey; small wonder, we have heard that the "honey and locusts" that John, the Baptist, ate, was really a mis-translation of "honey and grasshoppers," Can anyone verify that?

Anyway, eating them fried and without any honey or catsup, etc., they tasted something like fried okra. We liked them well enough to have had them several times now. In a survival situation, we suppose one might want to just roast them on a rock next to a fire, unless you have some cookware and oil along. We would be delighted to see more articles or letters about abundant, easy to catch insects, or even more recipes for grasshoppers. We think that in writing "insects as food" articles, it is important to try to describe the taste of the various food items to help people get over their fear of the unknown. Please feel free to contact me: Charles Griffith; 8514 Beulahland Drive, Ozark, AR 72949-8810; phone: 501-667-9820.

Postscript: During this past decade, while the Griffiths were perfecting their fried grasshopper procedures, young son, Joshua was watching his parents. Now, as a 12 year old, Joshua (and his parents) find it quite usual for him and his friends to bring in a handful (or, perhaps, a hat-full) of grasshopper from the prairie where they live, for mom to fry for a tasty snack for them. Yes, many Euro-Americans, contemporaries of Joshua, are growing up with similar attitudes, grasshoppers mean "tasty snack!"



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Food Insect Festivals Of North America

November 1997. Volume 10, Issue #3.

Florence V. Dunkel, Department of Entomology, Montana State University-Bozeman

Who eats insects in the US and Canada? The US Food and Drug Administration (FDA) Approves of Insects in Processed Food up to certain levels. The US Military trains its people to collect wild insects in Survival Situations. Tens of thousands of Americans and Canadians consume insects each year at Insect Festivals.

During the past 10 years, 1988 through 1997, the editors and contributors to The Food Insect Newsletter have chronicled a steadily rising interest in entomophagy in the U.S.A. and Canada. We have noted the increase in space and time devoted to food insects in the newspapers, magazines, radio, and TV. In the past year, we documented a rise in the . publication of books on food insects, photography books, cookbooks, and others for the general public. We have described, in the U.S.A. and Canada, the rise of local insect awareness festivals. The festivals, themselves, are an interesting phenomenon that may lead to a lasting change in Euro-America culture. Often these festivals involve thousands of young people, primary grades through college. Many festivals are associated with Insectaria, insect zoos, and park reserves. Other festivals are associated with Departments of Entomology and national or regional meetings of entomologists. It is the involvement of significant numbers of young people that is, perhaps, the strongest harbinger of "changing times." The present young generation of Euro-Americans is growing up with the idea that some insects are beneficial and some are actually good to eat. Let' s take a walk through offerings at food insect festivals in the U.S.A. and Canada. The following is a representative summary of who i5 doing what at some of these festivals. What environments have spawned these festivals? What is responsible for their extraordinary, largely unpredicted, popularity?

New Orleans, Louisiana, The Audubon Institute.

Zack Lemann, Education Coordinator for the Termite Outreach Program of the Audubon Zoo. Audubon Institute, 6500 Magazine Street 70118 (phone: 504-861-2537 ext. 6170; fax: 504-861 -2426). Insects are clearly an interest of The Audubon Zoo. The Zoo recently closed the butterfly house that ran for five seasons and will soon be adding an Insectarium (2001). The Audubon Zoo is located adjacent to Audubon Park on beautiful, historic St. Charles Avenue, across from the main administrative building of Tulane University. Although the Zoo is centrally located for visits by tourists, school groups, and families, a major part of the Audubon Zoo's education effort is outreach programs which travel to schools, community groups, festivals and fairs. One of the popular programs is the "Bugmobile" which contains live spiders, millipedes, centipedes, and insects and is sponsored by the US Department of Agriculture (USDA) as part of the public education portion of a large, multifaceted grant dealing with the Formosan subterranean termite.

Food insects, as well as "zoo insects," play an important role in the new "insect focus" of the Audubon Institute. "**Taste of the Wild Side**," most New Orleans folk will tell you, is a well-publicized event in Spring of each year. New Orleans has a mixture of many cultures, each of which places a strong emphasis on food that is part of distinct cuisines, several of which are quite well-known, e.g., Cajun, Creole. These cuisines use a number of arthropods, such as "crawdads" (crayfish). Mr. Lemann has been expanding the New Orleans culinary repertoire of arthropods in several ways recently and would like to include the use of one of the new and most destructive pests in New Orleans, the Formosan termite. This termite is now threatening the old wooden structures of the French Quarter and the lovely old homes and live oak trees (100 and 200 years old, respectively) along St. Charles Avenue and other famous areas of the city. Mr. Lemann suggests to the city, "Why not eat them?" To introduce the idea of termites as a culinary target to New Orleans cultures, Mr. Lemann would like a more reliable, non-insecticide sprayed source and is hoping some of the Newsletter readers can point him to a good source of edible Formosan termites. It is probably not possible that the Formosan subterranean termite will become so popular for eating that local termite populations decline below the economic injury level.

This has happened with non-pest, food insects in Bali and temporarily, locally, with locusts in Africa. It is an interesting concept, managing pest insects by developing them into a sought-after delicacy.

Food insect festivals are an excellent way to introduce new culinary ideas. Originally, the Audubon Institute organized an annual event called "The Incredible Edible Insect." Over 1,000 people attended each year it was offered (1997 and 1998). The Edible Insect Event was held at the Louisiana Nature Center (operated by the Audubon Institute) located in the eastern area of New Orleans, near Lake Pontchartrain and 10 miles from downtown. These "wild" (not currently raised for food) cookery events were held in June. The first year, 7 insect dishes were offered. The second year, 10 dishes were presented. These included: Jambalaya with crickets and mealworms (with rice, tomato paste, and celery); Toffee Surprise with chopped roasted mealworms; Cricket (roasted) Pancakes (Mr. Lemann calls them fritters); Mealworm Minestrone (from Taylor and Carter's cookbook [Entertaining with Insects](#), 1992, 160 pp.); and chocolate-covered roasted crickets. The first year, Mr. Lemann's crew did "Crawlins," similar to New Orleans pralines (pronounced "prawleens") but with mealworms. This is quite a difficult dish to prepare since the sugar has to be cooked to exactly the right temperature and then simmered until an exact consistency is achieved. For a precise recipe, see this issue of the Newsletter, recipe section.

In 1999, the Edible Insect event was combined with another annual event focused on eating "wild" (not raised for food) vertebrates. It was called "Taste of the Wild Side" and held in March for the first time. Attendance was only 600 this year, but the March date meant that the Wild Side was competing with many other festivals during this period of New Orleans' best weather. This year, there were the usual insect dishes plus wild honey,

alligator, nutria, soft shelled crawfish, wild duck, and Louisiana bowfin caviar. Five insect dishes were used this year: chocolate chirp (This is a Zack Lemann name) cookies (house crickets, *Achaeta domestica*); poached waxmoth (*Galleria mellonella*) larvae on plain wheat crackers with honey; banana mealworm (*Tenebrio molitor*) bread; crispy Cajun crickets (*A. domestica*). After oven roasting, Tony Chachere's seasoning was added. A culinary cue gleaned from Zack Lemann is: when making banana bread, chop the oven-roasted mealworms instead of putting them in the batter whole. Chopped mealworms make the slicing of the banana bread smoother. Banana mealworm bread was new this year. For many of the aforementioned recipes, see the recipe section of the next issue (Volume 11, Number 1) of the Newsletter. Note: some humans have mealworm allergies, even those who do not have a reaction to other insects, crabs, shrimp and other arthropods [Frey et al. 1996, *Allergy and Asthma Proc.* 17:215-219].

New Orleans, Louisiana, The Jonathan Ferrara Gallery. (Note: Because of the late printing of this 1997 issue, we are accurately able to "predict" future events. The art gallery feast is one of these predictions.) Art galleries are an unusual place to encounter an insect feast. In New Orleans, however, this has already occurred at least once. In spring 1999, The Jonathan Ferrara Gallery was showing an exhibit entitled "Carnivale Animale" by a local artist, Alex Beard. The art works were all animal-related. To increase attendance at the exhibit, the Gallery decided to offer an insect dinner. Zack Lemann (of the Audubon Institute) was engaged to plan and orchestrate the feast. Thirty people were served. The main course was angel hair pasta with peas, crickets, and ham in a cream sauce. A side dish served was sautéed mushrooms and mealworms in garlic and butter. For this mealworm dish, Mr. Lemann used the super mealworm, *Zophobas morio*. To the Newsletter Editors, this dinner menu sounded simply delicious. (Note: The Newsletter editors prepared the same mealworm dish, but with the smaller mealworm species, *T. molitor*, for the Entomological Society of America 1999 Pacific Branch, Eugene, Oregon, with rave reviews by many of the 50 entomologists present.) The Ferrara Gallery dinner was Mr. Lemann's first time preparing for a non-public food insect event. Mr. Lemann summarized these two experiences, the public festival and the "sit-down" formal dinner as follows, "For the dinner, 30 people came specifically to eat insects as the main entree for the meal and so it was significantly more special. The guests were specifically invited and it was not a "taste-if-you-dare thing." All but one were first time insect eaters, but it was a serious, dignified event. The five members of the Board of Directors of the Newsletter have each also had similar experiences contrasting the public festival and the formal dinner experience. They would underscore Mr. Lemann's statement. We would all agree that there is an important place for both types of events. Hopefully, we will begin to see more of the serious dinner events in the future.

Los Angeles, California, Natural History Museum of Los Angeles County, Ralph M. Parsons Insect Zoo, 900 Exposition Boulevard, Los Angeles, CA 90007. **Arthur Evans, Insect Zoo Director** (phone 213-763-3558; fax: 213-744-1042; e-mail; aevans@usc.edu; WWW.NHM.ORG). The Insect Fair is an annual event hosted by the Ralph M. Parsons Insect Zoo. The Insect Fair began in 1987. The attendance began at 4,000 and by 1997 reached 7,000. Over the years, several vendors sold a variety of food insects at the Fair,

usually in the form of candy. (Because of the late printing of this 1997 issue, we are accurately able to "predict" future events. This food insect demonstration is one of these predictions.) By 1999, the two-day event was attended by over 8,000 people. 1999 marked the first year actual food insect dishes were prepared. Zack Lemann (see preceding paragraphs) of The Audubon Institute, New Orleans, Louisiana, served as chef for this introductory event. There was considerable local media coverage (CBS, NBC, FOX) for the 2-day event. On Saturday and Sunday 15 and 16 May 1999, Mr. Lemann gave two half-hour presentations (combined slide show and cooking demonstration) each day. An average of 250 people attended each of the four sessions. For these presentations, Mr. Lemann prepared crispy Cajun crickets and poached wax moth larvae appetizers (see the recipe section of the next issue of the Newsletter, Volume 11, Number 1). One day before the event was to begin, the Los Angeles County Health Department decided to require all persons preparing food to have Health Department Certification. This was impossible on such short notice, so the only people who were allowed to taste the insect dishes were employees of the Natural History Museum. The audience could only watch. In spite of these constraints, all went very well. At the end of the presentations, commercially-available flavored (barbecue, cheese, and Cajun) mealworms were distributed. Three hundred packages were set aside for distribution at the end of each presentation and they disappeared almost immediately. Art Evans indicated, when asked about the future, "The next time we pursue a food insect event, we will probably contract a licensed kitchen to prepare the insects off site, thereby alleviating bureaucratic health concerns." Note: in a future issue of the Newsletter, we will address health clearance issues for large insect feasts. Part of the difficulty is that prior to preparation, insects are considered meat and under the jurisdiction of the US Department of Agriculture (USDA) and when the insects are prepared as processed food, it is the US Food and Drug Administration (FDA) that makes the rules. In this issue, we did review a book chapter on U.S. regulation of food insects. There seems to be a widespread lack of information on whose permission to ask for and when to ask. In Canada, the process for obtaining health clearance seems to be more clear.

Prior to and after the event, there were news segments that included the food insect portion on 3 of the 4 major networks. According to Art Evans, "Food insects serve to add to the "bizarre" and exotic image of insects at insect events, hence our marketing department has a lot of interest in promoting food insects as a "hook" at the LA Insect Fair."

West Lafayette, Indiana, Purdue University, "The Bug Bowl." For more information contact Jenny Franklin, administrative assistant for student services, Dept. of Entomology (phone; 765-494-9061; e-mail; jenny_franklin@entm.purdue.edu). This festival, was founded by Dr. Tom Turpin (phone; 765-494-4568; fax 765-494 2152; e-mail; tom_turpin@entm.purdue.edu) in 1990. This event actually started as a class project, part of an insects and society course entitled "Insects: Friend and Foe" (Entomology 105). Public involvement, according to Dr. Turpin, was a nice surprise. The first public event occurred in 1990. That year, on the day news reporters had come to campus to interview Dr. Turpin about corn insects, his research/extension specialty, Dr. Turpin's

undergraduate students were preparing for their class cockroach e~ent. During the corn insect interview, Dr. Turpin's students interrupted him numerous times to get assistance in marking their cockroaches for the annual Entomology 105 Roach Races. Somehow, the pending races made the local news, and that evening, 100 people arrived to watch the students race their cockroaches. It was the public response to this announcement that led to the idea of an insect-based, on campus festival. So the next year, 1991, a weekend was set aside for the event. This event was conceived as a family occasion and although school groups attended, no special invitations were sent to schools. At the 1991 event, food insects were presented as a demonstration. Specifically, spice cakes, prepared earlier, were given to the public for a taste test. In one cake, 1/4th of the flour was substituted with ground mealworms, larvae of *Tenebrio molitor*. Participants could not distinguish the mealworm cake from the cake without mealworms. In fact, in a more formal evaluation of the spice cakes, Home Economics professors at Purdue University preferred the mealworm cake to the spice cake without mealworms, because of the moister and coarser texture of the mealworm spice cake. Chocolate Chirpy Cookies were distributed to participants and other interested folks. From then on, students took over operation of the Food Insects Booth.

In 1992, The Bug Bowl was held in conjunction with the Horticultural Show. The kick-off event for 1992 was a gourmet insect dinner for the highest officials representing "town and gown" or community and University leadership. The mayors of Lafayette and West Lafayette, the Dean and vice-president for Academic affairs and other community and University leaders attended the dinner. Preparing the dinner for these dignitaries was Chef Hurbert Schmeider, the chair of the Purdue University Department of Restaurant, Hotel, Institutional, and Tourism Management (School of Consumer and Family Sciences). Head waiter was Dr. Chris Oseto, Chair of the Department of Entomology, Purdue University. Pure beeswax candles contributed to the ambiance. There were other special "kick-off" events to open the festival in later years. At least 2 of the 9 years of the festival, Chef Schmeider, and several other chefs from the University Union facility organized a food insect cook-off the night before the Bug Bowl opened. Entomologists were involved, but the judging was done by professional chefs from the community.

After 1992, the combined events of the Entomology and Horticulture Departments were billed as "Spring Fest." Food insects are now served continuously during the fair at one of the stations in the food booth, located on State Street in front of the Agriculture Administration Building. Items at the Food Booth are free and servings are designed just for tasting not for satisfying large appetites. The Bug Bowl now receives national and international coverage through the Cable News Network (CNN) and International wire services. (See also Vol. 10, No. 1. page 7.)

Because of the late printing of this issue, we are able to predict the following: In 1999, 11,000 people attended the Bug Bowl, even though the weather provided 2 cold and rainy spring days [April 17- 18] . For this event, the Purdue group served Chex mix with wax moth larvae, chocolate chirpy cookies with dry-roasted crickets, Chinese stir fry with mealworms, *Tenebrio molitor*, in soufflŽ cups. Fest organizers estimated that about one-third of the crowd stopped by the food insect booth. Faculty and students participated

in this booth. Insects were obtained from Rainbow Mealworms and standard Health Service Procedures were followed. Apparently the same rules for handling hot-dogs at an outdoor festival apply to handling food insects. Recipes are handed out at the booth. Chinese stir fry was made in the food booth as an informal cooking demonstration. Cookies and the Chex mix were prepared prior to the festivities. New persons involved with putting on the Bug Bowl were amazed at the large number of people who tried the food insect items and that there always seemed to be a line at the booth. The booth was open continuously throughout the event. In addition to the free items at the Food Insect Booth, students in entomology (The Thomas Say Society) sell chocolate crickets as a fund raiser. Students use dry-roasted crickets and dip them in chocolate. In 1998 and 1999, this project netted \$1,000 per year.

Raleigh, North Carolina, North Carolina Museum of Natural History is the site of a festival called "**The Bug Fest.**" The first of these annual events was held in 1995. At the second annual such event, one impressionable guest, David George Gordon, was so moved that he later wrote The [The Eat-A-Bug Cookbook](#) (see book review Volume 11, Number 2, July 1998).- The Department of Entomology at **North Carolina State University** also assists in the event. For the involvement of the University, contact Dr. Ron Kuhr phone: 919-515-2745; e-mail: ron_kuhr@NCSU.edu or the Department of Entomology phone 919-515-7746 The Museum has had elaborate food insect dishes for the last few years. At "The Bug Fest," participants can buy meals rather than just taste a small sample as in the Purdue Bug Bowl.

Montreal, Canada, The Insectarium, Insectarium de Montreal, 4S81 rue Sherbrooke est, Montreal, HIX 2B2 Canada. Marjolaine Giroux is the Coordinator of the Insect Tasting Event and an Entomologist with the Educational Service of the Insectarium, phone: 514-872 0663; fax: 514-872-0662; e-mail: insectarium@ville.montreal.qc.ca The Insectarium, largest in North America, was the first North American Institution whose food insects festivals, called "Insect Tastings," achieved 5 digit attendance numbers on an annual basis. This festival has occurred every year since its inauguration in 1993. Until 1997, the festival was three weekends (six days total) and attendance was over 20,000 per year (for additional information see the Newsletter Vol. 9, No. 1, 1996, pp. 1 -2). In 1997, the attendance increased to a record of 25,000 people at Insect Tastings. Because of the late printing of this issue, we are also able to predict the following: In 1998, the attendance was again 25,000 people. Part of this phenomenal attendance may have been due to the Festival being expanded to sixteen days, two weeks and three weekends. The incredible Valentine's Day Gala opening event of previous years had been abandoned by 1999. "Insect Tastings" of 1999 was advertised as an Oriental feast with mealworm imperial rolls, Szechuan scorpions, glazed cake with black ants and many other dishes. Chef Nicole-Anne Gagnon presided during the 16-day festival and on Saturdays and Sundays provided cooking demonstrations for guests at the Insectarium . Cooperating with Chef Gagnon was Jean-Louis Themis (co-author with the Insectarium of *Des Insectes a Croquer: Guide de decouvertes* 1997 les Editions de l'Homme (see review this Newsletter issue p.8) and a team of students from the Institut de tourisme et d'hotellerie du Quebec. In conjunction

with the gustatory event, the film *Banquet in Bangkok* was shown as well as clips from the film *Giant Tarantulas* in which the Piaroa Native Americans in Venezuela catch, cook and eat the world's largest tarantula. Perhaps the amazing number of attendees at the 1999(27,000 people) festival was due to the advertising. Flyers to announce the event stated, "Our Insect Tastings are the perfect way to enjoy a new taste sensation, and to discover a protein-rich source of food valued in many African, Asian and South American countries. Step out of our North American culinary straitjacket and dare to try some Oriental style morsels at this year' s Insect Tastings." Admission was not charged for the event, only for admission to the Insectarium and Botanical Gardens: (in Canadian dollars) adults, \$6.75; seniors and students, \$5.25; and children, \$3.50. Summer fees are slightly more expensive. This is the admission fee whether or not there is an Insect Tasting Event in progress.

In 2000, the Food Insect Festival will be open for school groups by appointment only from February 21 -25. Reservations can be made for 9:30 a.m., 10:30 a.m., 1 p.m., and 2 p.m. The public will be welcome February 19-20 and February 26 to March 5, 2000 from 1 to 4 pm. Chef Nicole Anne Gagnon will again be creating the dishes. For the food insect festival in 2000, only 7 items will be chosen. Planning for each event takes an entire year. These 7 dishes for the year 2000 festival will also include some non-insect arthropods, such as scorpions from China as well as ants prepared according to Chinese culinary tradition. There will be a dish with phasmids (walking sticks), and other dishes with the more "traditional USA and Canadian standbys," wax moth larvae, *Galleria mellanella*; house crickets, *Acheta domestica*; and mealworms. The mealworms, in 2000, however, will also be somewhat innovative. *Tenebrio molitor* is the standby species and larvae are the "standby form" in Canadian and U.S.A. insect culinary tradition. In 2000, the Insectarium will use the super mealworm, *Zoophobas morio*, and the pupal stage only. It is possible that this item will become a new U.S.A./Canadian standby since it overcomes small size and heavy sclerotization (chitin) problems.

The seventh dish that will make the final selection will be either locusts or African caterpillars, the mopane. The choice will depend on availability. In the past, migratory locusts, *Locusta migratoria*, were an outstanding favorite of the public. The Insectarium obtained the locusts as a byproduct of scientific research in Ontario, but with changing research priorities, these are no longer available. Large quantities of mass-reared food insects is a perennial problem in the USA and Canada. In this second decade of existence, a new function of the Newsletter may be to serve as a clearing house for commercial insect suppliers and directors of large events such as the Montreal festival. The Insectarium has served mopane twice in the past, each time they were brought to Montreal in a dried form from Africa by an entomologist. It is really only possible if someone hand carries them into Canada (or the USA). The Chef for the Insectarium event served them both re-hydrated and dry. Re-hydrated, it was soft and somewhat juicy in the interior. When dry, some people thought it tasted like wood. Some people really liked them re-hydrated, some specifically preferred it dry, and some people did not like it. It sounds as if mopane are like any specialty food such as escargot, oysters, mussels, and scallops. Some people like them very much and some do not.

Finding appropriate insects for such a large festival can be a monumental problem. Those involved with planning the Montreal food insect festival always need new insects for their tasting event. For several years, the Nepalese dish, Bacuti was served. Bee brood (=the larvae and pupae of bees still in the comb), which this Asian dish requires was difficult to work with but the bee keeper of the Insectarium staff had developed a method of squeezing the comb (extracting the brood), packaging it and freezing it. Now, however, this labor intensive method is too expensive. Wax moth larvae are used by the Insectarium when dry, actually dry roasted in oven just like crickets. According to Ms. Giroux, "Just eat it, it tastes like bacon; Salty." Termites would be an excellent addition to the offerings of the Insectarium . Apparently they are a lot of work, and, perhaps, difficult to obtain.

Insects served at the Montreal Insectarium are prepared with care by The Institut de Tourisme et d'Hotellerie du Quebec (ITHQ) in keeping with specific quality standards set by the Quebec Department of Agriculture, Fisheries and Food (MAPAQ). Every year, visitors consume an average of 100,000 mealworms, 60,000 crickets, 10,000 locusts, 10,000 honeybees, and 5,000 silkworm pupae at the Insect Tastings.

Cleveland, Ohio, Metro Park, "Bugfest" was first held in August 1997 (See also Vol. 10, No. 1, p.6) in the Garfield Park Nature Center in Garfield Park Reservation. Entomologists served chocolate chirp cookies, mealworm spice cake and hot bug-and jalapeno dip. Cleveland MetroParks was the sponsor. For additional information contact John Stinson, Cleveland Metro Park, 4101 Fulton Parkway, Cleveland, Ohio 44144, telephone: 216-351 -6300 ext. 274.

Edmonton, Alberta, Provincial Museum of Alberta. The first food insect festival was held in October 1996 in conjunction with "Bug World," an exhibit of giant robotic insects. One thousand marinated crickets wrapped in bacon as well as cookies with cricket and mealworm flour were served (see Volume 9, No. 3, pp. 9 and 11).

Washington DC, Smithsonian Museum of Natural History also holds a "Bugfest." One of our new members alerted us to the event held on the mall. The Cajun fried crickets and mealworm caramels were outstanding we were told (see Volume 11, Number 1, Letters to the Editor).

Philadelphia, Pennsylvania, The Insectarium, Jennifer Bush, Director (Phone 215-338-3000) has an annual food insect festival in January. The festival usually consists of three consecutive weekends. Items such as pizza and Chex mix are prepared, but due to Pennsylvania restrictions on any food prepared at a fair concession or restaurant, these items can only be demonstrated and not served to the public. To serve these items to the public, the same regulations that a restaurant meets has to be met by any group serving food insects to the public. The interesting item about this Insectarium that holds the food insect events is that it is housed and supported by an exterminating company.

Ames, Iowa, Iowa State University has had a food insect festival run entirely by the

students.

Champaign-Urbana, Illinois, University of Illinois, Dr. May Berenbaum (phone: 217-333-7784; fax: 217-244-3499; e-mail: maybe@uiuc.edu). Predating all of these food insect festivals of North America was the Fear Film Festival, an insect horror movie festival with the usual munchable treats, peanuts and popcorn, in addition to food insects. It is possible that this festival was initiated in 1984-1985, the first of all the North American (Euro-American, that is) that featured food insects. This festival has now expanded to include cockroach races as well.

The Entomological Society of America (ESA), (phone: 301 -731 -4535; fax: 301-731-4538; e-mail: esa@entsoc.org; and <http://www.entsoc.org>). What more appropriate gatherings at which to serve food insects than assemblies of members of the ESA! The first major food insect event that the Editor recalls at ESA meetings was the Purdue University Mixer at the National meetings in 1990 held in Indianapolis, Indiana. This event featured cricket hor d'ouerves of all kinds, including some cheese puff items whose unique taste and texture I still remember. Orchestrating the event was the Director of the Restaurant, Hotel, Institutional, and Tourism Department at Purdue University, Mr. Hubert Schneider, who prepared the dishes in the hotel kitchen with his staff from the University. Also involved was Dr. Tom Turpin, Professor of Entomology, Purdue University and the then immediate past President of the ESA.

The next food insect event I recall at national meetings was a presentation I gave in the Formal Conference on Teaching (Reno, Nevada 1991). The presentation was at 8:30 a.m. so I chose a fruit-based dish that I developed, entitled "Curried Grasshoppers." The shredded coconut and raisins were a new taste with the excellent Bozeman-reared grasshoppers, *Melanopus sanguinipes*. About 250 people were present and a San Francisco TV station did a news segment on it, filmed on location (copies of this newscast are available for educational purposes from the Food Insect Newsletter). The next food insect feed of which I am aware was an address I gave for the Formal Conference on International Affairs (Nashville, TN, December 1997). The main objective of the presentation was to explore the dangers of not incorporating food insect issues into integrated pest management programs in countries where there is a food insect tradition (which is everywhere except the Euro American portion of the US and other European-based cultures). This symposium was attended by about 150 entomologists and we served grasshopper stir fry. The following day, I did a live cooking demonstration for Opryland Radio that aired during rush hour that day.

After each National ESA meeting for the past 5 years or so, there has been an "Insect Expo." This event, basically a one-day fair, generally draws 30004,000 students bussed in with their teachers from local elementary and secondary schools. Since the national ESA meetings rotate to each region of the USA, it is a new community almost every year. Usually a food insect booth is part of the Fair. Thus, this event alone exposes thousands of different teachers and young students to entomophagy each year.

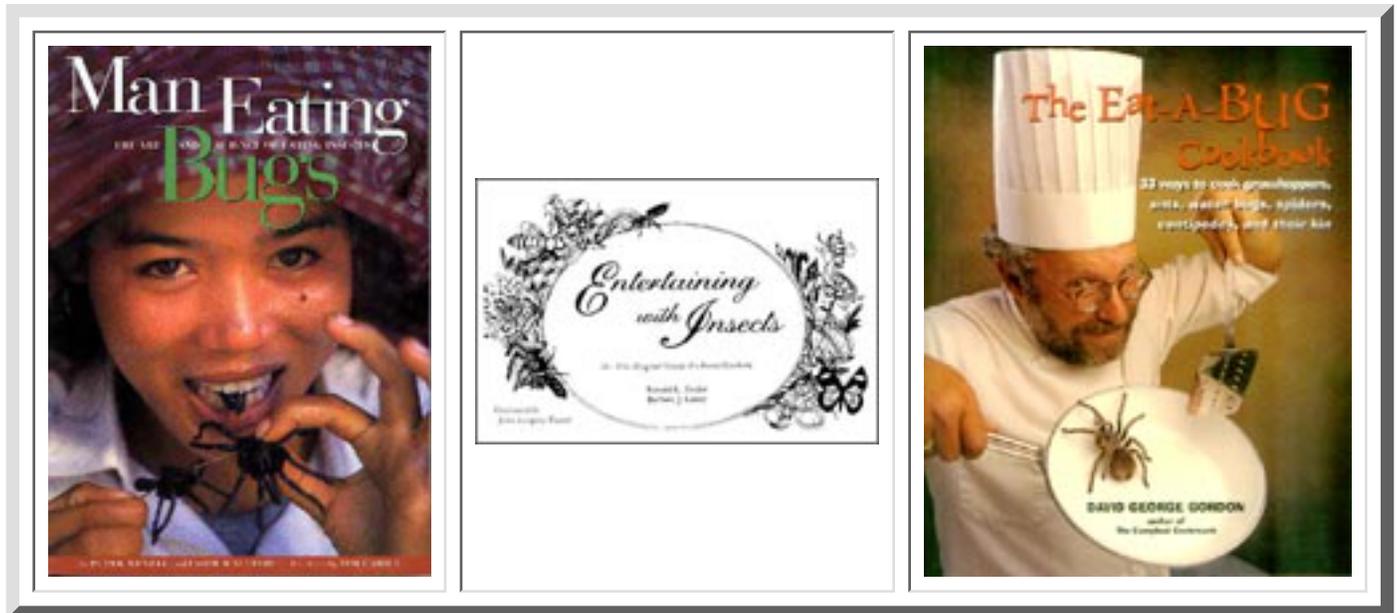
Regional meetings of the ESA have also had their share of food insect events. For the 1995 keynote address at the ESA Southeastern Branch in Charleston, South Carolina, I gave a general introduction to food insects around the world while some of the students at Clemson University prepared insects for the ca. 250 entomologists at the opening ceremonies. The "chef" of that event was Mr. David Jenkins (who later became my graduate student and following his M.S. in Entomology became a Board Member of the Newsletter. Mr. Jenkins and his colleagues served waxmoth larvae (*Galleria melonella*) creole and grasshopper (*Melanoplus sanguinipes*) stir fry. This year, the organizer of the 1995 event, Dr. Joseph Culin, organized a food insect session, including a cooking demonstration, for a mini-insect expo for teachers following the Southeastern Branch ESA meetings (1999) held in Florida. David Jenkins, now a Ph.D. student at University of Georgia was also involved in this presentation.

Invertebrates in Captivity (Robin Roche, organizer of food insect portion of meetings, phone: 602-621-1153) is an organization of professionals who raise insects, generally for zoo exhibits, insectaria, park reserve exhibits, and butterfly houses and who meet annually for information exchange. Also appropriate at these annual meetings is the cooking and serving of food insects. In 1997, Robin Roche organized both a pre-conference workshop in a professional kitchen for the preparation of insect appetizers (see Vol. 10, no. 1 . p. 6) and a formal symposium on food insects. Conference attendees were then able to sample the results of the workshop at the opening event of the conference . Newsletter patron, Dr. Mitsuhashi, was featured guest speaker.

Editors Postscript: In 1999, the Education Symposium of the Pacific Branch ESA held in Eugene, Oregon, had both the Editor and Associate Editor of the Newsletter involved in the Food Insect presentation. I gave a slide presentation and Robert Diggs was the "chef," assisted by students from the Department of Entomology, Oregon State University. We served bachuti (a Nepalese dish) for hor d'oeuvres. Dr. Lynn Royce, organizer and moderator of the event supplied the bee brood (a frame of wax chambers containing larvae and pupae of the honey bee, *Apis mellifera*). Under Dr. Royce's guidance the bee brood was carefully cooked (similar to preparing scrambled eggs). The bee brood was served on crackers with various garnishes including olives, parsley, and pimento. Mealworm tacos were the main entre. (The Associate Editor's success at preparation of this dish was discovered by fellow faculty at the Montana State University College of Business and so he did a "command performance" for one of their Fourth of July social events, thus illustrating the impact of these festivals and public social food insect events on informal cultural practices.) Dessert was Chocolate Chirpy Cookies (the house cricket, *Acheta domestica*, was the "chirpy") which I prepared the evening prior to leaving for the meetings.

In December of 2000, the Entomological Societies of Canada and America are meeting jointly in Montreal. The possibility is being discussed of having food insects the opening night of the meetings. Marjolaine Giroux, Entomologist with the Educational Service of the Insectarium at the Montreal Insectarium and member of the ESA local arrangements committee, will keep us informed of the specifics of this event. Visits to the Insectarium

will be arranged for attendees and possibly some symposium presentations will address issues raised in this article about food insects, e.g., governmental inspection, reliable availability of large quantities through mass rearing, and the rapidly increasing interest of the public in Canada and the United States in consumption of food insects. Members are encouraged to contribute posters and papers related to food insects in the regular contributed sessions.



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Raising Mealworms

March 1996. Volume 9, Issue #1.

(This article is adapted from a leaflet prepared by the Insectarium of Montreal for the public. The leaflet contains several illustrations and photos and is available free in French and English. It is a much-needed contribution and an excellent start in making food insects more of a possibility for the general public in North America. The leaflet contains exactly the kinds of information for which many of our U.S.A. and Canadian Newsletter readers have been asking. Another leaflet is now available on crickets and will be featured in the next Newsletter with appropriate recipes. What is needed next is a similar efforts on how to rear and serve home-grown waxmoth larvae. To request a copy of the mealworm leaflet, write to: Ms. Marjolaine Giroux, Insectarium de Montreal, 4581 Sherbrooke Street East, Montreal, Quebec HIX 2B2, Canada. Tel.: [514]872-0663.)

Partial text of the leaflet: Eating insects is a long-standing tradition in many cultures. People in some countries of southern Africa, for example, consume great quantities of different species of caterpillars. In Mexico, 'ahauhutle,' the eggs of water bugs, and 'escamoles,' black ant larvae, are traditional Indian dishes. Some species of ants are very popular with the inhabitants of southwestern China and in Southeast Asia, the giant water bug, *Lethocerus indicus*, is considered a true delicacy.

For many in the Western world, insects are viewed as a culinary curiosity, and are most often considered the last resort of people in other parts of the world who have nothing else to eat. It is true that in some cases people eat insects out of necessity. Generally speaking, however, it is the abundance, accessibility, nutritional value, and taste that makes insects popular as food. Insects contain proteins, lipids, minerals (mostly zinc, copper, and iron), vitamins (in particular, riboflavin and thiamine), and water. Chitin, the polymer which forms insect exoskeletons, is not easily digested by humans and thus thought to be a source of dietary fiber.

Quality Insects

Eating insects is becoming more and more popular in Western cultures. However, there is little information available on edible insects available in areas where these Western cultures are located. Since one cannot know under what conditions any insects one may capture in the wild developed, it is best not to eat them. They may have been exposed to pesticides, fed on and accumulated plant toxins, or contain parasites or bacteria. [Ed. If insects are thoroughly cooked, like pork or wild game, the meat will not transmit parasites, bacteria or viruses].

Although it is still not possible to dash to the supermarket to obtain that unique, entomologic addition to your menu, it is possible to raise your own. If you wish to add

insects to your daily menu, or, even to have on hand for those special parties, the best approach is to raise them on a small scale at home. This will allow you to control the conditions under which they develop and reproduce.

Mealworms are one of the easiest insects to raise at home in the kitchen area. Raising your own mealworms means that they are available, year-round, at no significant cost, and ready to use at the last minute, even as the guests are arriving. Yellow mealworms, *Tenebrio molitor* (Family: Tenebrionidae), are well suited to this type of 'insect farming.' These beetles are small, reproduce quickly and are resistant to disease and parasites. In addition, they are simple to handle and require little space and maintenance. There are four stages in its life cycle. The egg is 1.8 mm; the larva grows from ca. 2 to 30 mm; the pupa is ca. 16 mm; and the adults are 16 mm.

How to Raise Mealworms

Equipment

Acquire at least 3 containers, preferably plastic. To provide proper air circulation and prevent condensation, punch holes in the lid and cover the lid with mosquito netting or cheesecloth. Suggested dimensions for this rearing container is 41 cm x 28 cm x 15 cm.

Feed the mealworms mixed grains such as: oat or wheat kernels (10 parts), rolled oats (oatmeal) or whole wheat flour (10 parts); wheat germ or powdered milk (1 part); and brewer's yeast (1 part). Brewer's yeast can be obtained at health food stores. This is an important ingredient, because it provides proteins and trace elements essential to the insects' growth.

To supply the water that these insects need to develop, provide bits of vegetables (cabbage, carrots, potatoes, lettuce, etc.) or fruit (mainly apple). Monitor this item daily to watch for visible mold growth. Immediately replace the water supply when mold growth appears.

When all is in readiness, obtain the mealworm larvae starter culture. This can be bought from pet shops where they are used as food for reptiles and amphibians. Bait shops may also have these available. If there is no such source in your area, national suppliers will fly the mealworm starter culture to you where ever you are. Some of these North American suppliers are: Rainbow Mealworms, PO Box 4525, Compton California; Yarbrough Bit Distributors, Route 2 Box 202, Heidelberg, Mississippi 39439; and Sure-Fire Fresh Bait RR 6? Calgary, Alberta, Canada. You will need about sixty larvae to start your 'farm.'

Culture Management

In one of the culture containers, place about 2.5 cm of the grain mixture, the mealworm larvae, and bits of vegetables and/or fruit (=the water source). As soon as the first pupae appear (this is a non-feeding and non- ambulating stage), transfer them to another container, an empty box. This will prevent the larvae from eating the pupae. For the same reason, the adults must be separated from the pupae as soon as they emerge from the pupal 'skin' (exuviae). Transfer the adults into a third box, also containing 2.5 cm of the

grain mixture and chunks of vegetables or fruit.

The males and females of the mealworm are indistinguishable. They mate 2-5 days after emerging, and the female lays up to 40 eggs a day. The eggs take 12 days, on average, to hatch. The larvae molt several times over a period of about 10 months, until they reach 25-30 cm in length. It takes about 12 days for the pupa to complete metamorphosis into an adult. The adult lives, generally, only 2 months. All in all, at temperatures from 18°C to 25°C, the insect's life cycle is about one year.

Culture Maintenance

Replace the pieces of fruit or vegetables when they dry out, and remove any dead insects. Stir the grain mixture from time to time to incorporate the larval skins, so that they will also be consumed by the larvae. Change the mixture when it begins to look sandy. You will have to remove the insects one by one or separate them using a sieve.

Helpful Hints

Clean the containers thoroughly before using them. To speed up the insects' development, keep your 'farm' at a temperature of from 25°C to 30°C. Above 30°C there are negative effects on growth and development. Avoid placing the containers in bright sunlight. Keep the cultures in a dimly lit, dry, and well ventilated place. Keep the mixture as dry as possible to avoid mold and other undesirable organisms. Keep your insects in a number of different containers to minimize losses due to contamination or any other problem.

When to Begin Harvesting the Larvae

Since you are developing a stock culture and it is the larval form of this insect that is eaten, you would want to wait for the first generation after the parents to harvest any larvae. In concrete terms, this means that you must feed the larvae that you obtain from a commercial source until they become adults, allow them to reproduce, and then 'harvest' the larvae of the new generation. Make sure, of course, that you leave enough of the larvae to keep your farm running!

Preparing the Insects for Use

Before you begin whipping up delicious insect meals, you must take some precautions: Always kill the larvae by freezing them alive. About 48 hours is sufficient. You can keep them in the freezer for a few months if they are properly wrapped in airtight bags or containers.

Insects can deteriorate quickly, just like meat that is left out on a counter. Always keep them in the freezer until you are ready to use them. It is also a good idea to rinse them in running water before you cook them.

Never eat any insects of doubtful quality (rotten smell, unusual color, etc.). If in doubt, DON'T.

Start the Ovens

Dried mealworm larvae can be used in place of nuts, raisins, and chocolate chips in many cookies, bread, and dessert recipes. In powdered form, mealworm larvae can also replace part of the flour in cakes or pie crusts. If they are just barely thawed, whole, or ground, they can be added to sauces or used to make delicious spreads.

Mealworm Recipes

We suggest these starters to try out your new culinary raw material. The following recipe was developed by the *Food Insects Newsletter* Editor and taste-tested by undergraduate and graduate students at Montana State University and various dinner guests at the Dunkel/Diggs home:

Hot Mealworm Appetizers

Ingredients:

5 ml (1 tsp.) cayenne
2.5 ml (1/2 tsp.) black pepper
85 ml (1/3 cup) mealworm larvae, slightly thawed
30 ml (2 Tbsp) butter or margarine

Place all ingredients together into a sauce pan. SautŽ, stirring constantly, until the mealworms are golden brown. Drain and serve. Or, these may be added to a hot bridge mix available in many grocery stores. Or, one may add them to 'Party Mix' made from cold cereal squares, pretzels and nuts. The combination made at home to which one could add the mealworms for extra nutrition, fiber, and interesting texture is as follows: Melt 1/4 cup margarine in roasting pan in preheated 250°F oven. Stir in 5 tsp. Worcestershire sauce, 1-1/4 tsp. seasoned salt, 1/4 tsp. garlic powder. Gradually add: cereals (2-2/3 cup corn squares, 2-2/3 cup rice squares, 2-2/3 cup wheat squares); 1 cup nuts and 1 cup pretzels. Stir to coat evenly. Bake 1 hour, stirring every 15 minutes. Spread on absorbent paper to cool. Store in airtight container. Makes 10 cups. The following recipes are from: [Entertaining with Insects: The Original Guide to Insect Cookery](#) By Ronald L. Taylor and Barbara J. Carter. 1992. Salutek Publ. Co. Yorba Linda. 160 pages.

Mealworm Cookies

Ingredients:

550 ml (1-1/4 cups?) all-purpose flour
5 ml (1 tsp.) baking soda
5 ml (1 tsp.) salt
250 ml (1 cup) softened butter
175 ml (3/4 cup) white sugar
125 ml (1/2 cup) crumbled dried mealworms
175 ml (3/4 cup) firmly packed brown sugar
5 ml (1 tsp.) vanilla
2 eggs

360 grams (1-1/2 cups) chocolate chips

Place the cleaned and prepared insects on a cookie sheet and dry in the oven for 1 -2 hours at 100°C (200°F). Preheat oven to 190°C (375°F). In a bowl, mix the flour, baking soda and salt. In another bowl, cream butter, white sugar, brown sugar, and vanilla. Stir in eggs. Gradually add the flour mixture. Stir in chocolate chips and mealworms. Drop by teaspoonfuls onto a cookie sheet, and bake 8- 10 minutes.

Mealworm Canapés

Ingredients:

85 ml (1/3 cup) mealworm larvae, slightly thawed

2 garlic cloves, finely chopped

5 ml (1 tsp.) tomato paste

15 ml (1 Tbsp) olive oil

5 ml (1 tsp.) lemon juice

5 ml (1 tsp.) red wine vinegar

plus: red wine vinegar, freshly ground pepper, loaf of French bread (baguette), finely chopped fresh parsley

With a mortar and pestle or in a blender, mash the mealworms, garlic and tomato paste into a puree. Stirring constantly (or with the blender running), add the oil, a few drops at a time. Add the lemon juice, wine vinegar and pepper. Cut the baguette into 1.5 cm slices. Under the broiler, toast one side of the bread slices, and spread the untoasted side with the mixture. Place the canapés on a baking sheet and bake at 200°C (400°F) for 10 minutes. Sprinkle with parsley. **Siu Mai**

Ingredients:

250 ml (1 cup) mealworms

4 water chestnuts

60 ml (4 Tbsp) green onions, sliced

125 ml (1/2 cup) bamboo shoots

1 egg

5 ml (1 tsp.) salt

23 ml (1 - 1/2 Tbsp) soy sauce

30 ml (2 Tbsp) sherry

5 ml (1 tsp.) sugar

23 ml (1 1/2 tsp.) cornstarch

1 ml (1/4 tsp.) pepper

plus: wonton wrappers, dipping sauce (see below), vegetable oil

Place mealworms in blender, and grind until paste-like. Chop water chestnuts and add mealworm paste, green onions, bamboo shoots, egg, salt, soy sauce, sherry, sugar, cornstarch and pepper. Mix well. Fill center of won ton wrapper with 30 ml (2 tsp.) of mixture. Fold won ton in shape of a triangle. Moisten finger tips, and seal edges. Fold creased corners backward and secure the ends with more water. (They should now be shaped as a bishop's cap.) Place in skillet containing oil heated to about 350 degrees Fahrenheit. Fry for about 5 minutes. Serve with Dipping Sauce.

Dipping Sauce:

15 ml (1 tsp.) boiling water

15 ml (1 tsp.) mustard

15 ml (1 tsp.) vinegar

30 ml (2 tsp.) soy sauce

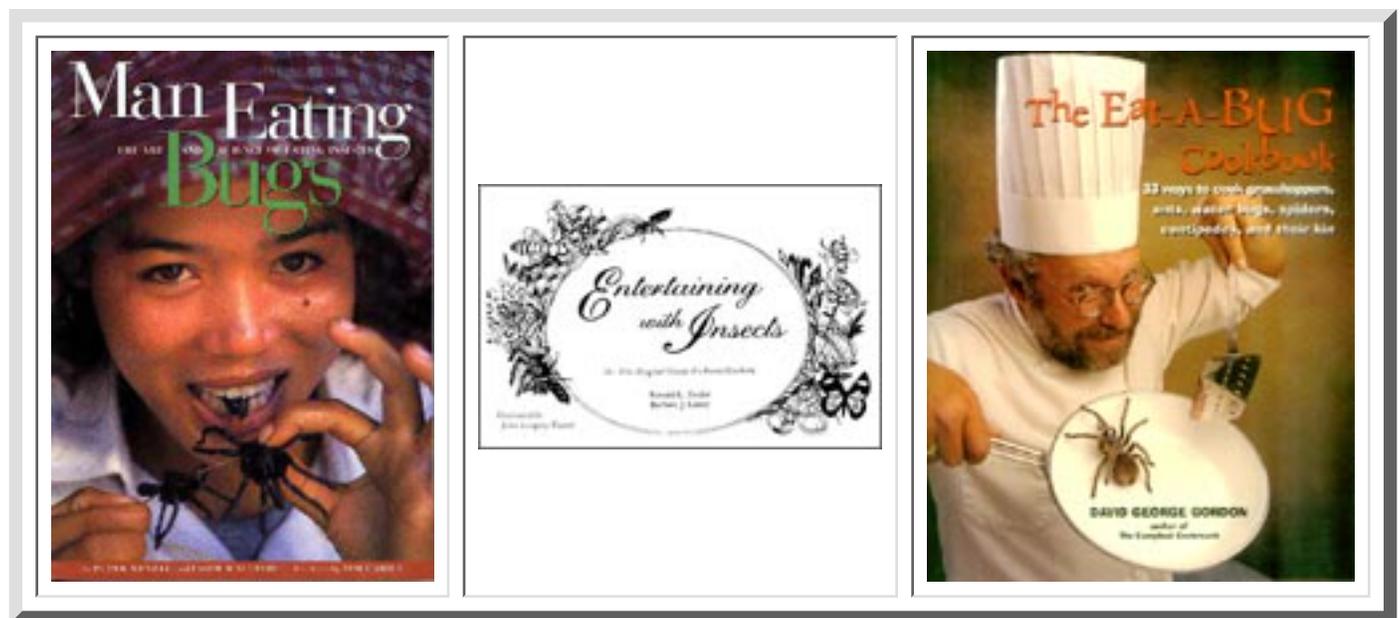
Add boiling water to mustard and mix well. Add vinegar and soy sauce. Stir well.

A Word About Leftovers

If you simply ordered too many mealworms for that special event, or your kitchen production unit has become too prolific, you can turn those leftovers into planovers. Place late instar larvae (older larvae, about to pupate) in plastic containers with small holes punched in lid. Cover larvae with wheat bran and place in the refrigerator. We have kept larvae up to one month in this manner, arrested at just the right stage for using in cooking.

Fast Snack Mealworm Alternative

If the recipes sound good, but you would just like a taste and not the initial effort of developing your own culture, you can order a new product from Hotlix (791 Dolliver, Pismo Beach, California 93449 USA phone (805)773-1942). Larvets, the original Worm Snax™, are mealworm larvae, now being sold roasted with barbecue, cheddar cheese, or Mexican spice flavors.



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Allergies Related to Food Insect Production and Consumption

July 1995. Volume 8, Issue #2.

By Joel Phillips & Wendell Burkholder

USDA-ARS Stored-Product Insects Research Laboratory

Department of Entomology

University of Wisconsin-Madison

Madison, Wisconsin 53706

Editor's Note: This is the third in a series of invited articles on potential hazards that could be posed by indiscriminate or careless consumption or handling of insects. We are grateful to the authors for generously agreeing to prepare the article under severe time constraints.

The cultural practice of entomophagy is old and well-established especially in non-industrialized regions of the world. Thanks to this newsletter, along with occasional anecdotes in the electronic and print media, human consumption of insects is a growing novelty in the U.S. and other nations not usually associated with the custom. Latter-day food insect devotees may simply want to sample species considered delicacies in other cultures, or they may be interested in the reputed nutritional or medicinal qualities of certain food insects. Regardless of motivation, initiates must first overcome the wide spread cultural taboo against the practice, that is, the idea that consuming insects is generally unhealthy. Proper methods of selection and preparation can largely nullify the health concerns associated with eating food insects. However, one matter will continue to nag the practice, and that is the possibility of allergies to insect derived foods. Virtually any food item can be allergenic. Yet, other arthropods such as shellfish (i.e., shrimp, lobster, crayfish) are particularly well-known for their ability to induce mild to severe allergic reactions in susceptible individuals. Thus, the risk can not be taken lightly. The following is a brief review of the potential health risks associated with the production and consumption of food insects.

The popular image of insect allergies is that associated with the bites and stings of venomous species like bees, ants, and wasps (injectant allergens). Over one-hundred deaths per year in the U.S. are attributed to fatal reactions to arthropod venoms. These accounts make hot news, although the vast majority of victims suffer little more than short-term itching, burning and swelling. More common allergic reactions attributable to insects include those caused by contacting body parts or waste products (contactant allergens) or inhaling microscopic dust particles composed of pulverized carcasses, cast skins and excreta (inhalant allergens). Allergies caused by contacting or inhaling insect material can have significant health consequences in the home or work environment with symptoms ranging from eczema and dermatitis, to rhinitis, congestion and bronchial asthma. In severe cases, sensitivity to insect material is heightened to the extent that the

victim can experience anaphylactic shock, a potentially life-threatening condition often involving rapid swelling, acute respiratory distress, and collapse of circulation. If possible, it is incumbent upon the sufferer to recognize and avoid insect allergens long before the onset of extreme sensitivity.

Since most insect allergies are of the contactant and inhalant type, it would be reasonable to assume that the greatest health risk associated with food insects would be to workers involved in their production. Owing to the small and obscure nature of the food insects industry, especially in the U.S., virtually nothing is known of such problems. However, there are many records of insect-induced allergies among workers in other enterprises. Workers shelling and cleaning walnuts in Bulgaria developed eczema, dermatitis and intense itching of the skin associated with exposure to the larvae and excreta of the Indianmeal moth. Although they are not insects, mites that infest cheese, bran, dried fruits, jams and sugars are known to cause transient dermatitis among workers when body fluids are released upon crushing. Records of inhalant allergies in the workplace make up the majority of case histories. In a NIOSH survey of USDA labs that rear insects, nine orders of insects plus mites and spiders were named as sources of the inhalant allergens. In his 1980 survey of insectary workers, Wirtz found that 67% of his respondents linked their allergy symptoms to direct or airborne exposure to lepidopteran (moth and butterfly) scales with emphasis on respiratory problems. Two labs had 53% and 75% of their personnel develop allergies to scales despite the use of exhaust hoods and protective masks and clothing. Case histories of asthma among Lepidoptera workers are numerous.

Reactions to Orthoptera (grasshoppers, crickets, locusts, cock roaches, etc.) are also common. In 1969 LeClercq reported that workers rearing locusts suffered rhinitis, itching skin, bronchitis and ultimately asthma in general sequence. Wirtz recounted one study of migratory locusts where all of the workers became allergic to the insect. The authors know of a researcher who suffered dyspnea (labored breathing) during a prolonged session of grinding crickets into meal to supplement chicken feed. Ominously, the three cases of anaphylactic shock reported by Wirtz involved orthopterans.

Workers exposed to the obligate beetle and weevil (Coleoptera) pests of stored grains and milled products have also been affected. Reports of skin itching, hives, rhinitis, dyspnea, and bronchial asthma are numerous and well-documented. Flies and midges (Diptera) as well as mayflies (Ephemeroptera) and caddisflies (Trichoptera) have likewise been implicated as allergenic hazards in the workplace. The above reports as well as others too numerous to mention in this article highlight the fact that insects and related arthropods pose a very real occupational health threat to workers repeatedly exposed to them. Coping with this problem can be an annoying inconvenience that has both economic and health consequences for the worker and employer. Although good ventilation, protective clothing, gloves and masks are common sense preventive measures (as well as being mandated by OSHA), reassignment of the sensitized victim to a non-threatening work environment is often the only viable remedy to the problem.

This brings us to the topic of ingestant allergens, that is, eating or unintentionally

swallowing allergenic insect material. Since we are not a nation accustomed to dining on "bugs", direct evidence for allergies to food insects is practically nonexistent. Nonetheless, entomologists are sometimes treated to nebulous accounts of people getting sick after deliberately eating insects. Since most everyone can name at least one food that turns their stomach, it is not clear what role, if any, psychological factors may have played in these illnesses. We can, however, gain some insight from controlled experiments on human subjects done with preparations of common food-infesting insects. A classic study by Bernton and Brown in 1967 utilized dialized extracts of seven of these insects in skin sensitivity tests of subjects with and without known allergies. Test extracts included those of the rice weevil (*Sitophilus oryzae*), fruit fly (*Drosophila melanogaster*), Indianmeal moth (*Plodia interpunctella*), sawtoothed grain beetle (*Oryzaephilus surinamensis*), red flour beetle larvae and adults (*Tribolium castaneum*), confused flour beetle (*Tribolium confusum*), and lesser grain borer (*Rhyzopertha dominica*). Of the 230 allergic patients, 68 (29.6%) reacted positively to one or more of the dialized insect extracts. Surprisingly, of the 194 non-allergic subjects, 50 (25.8%) showed sensitivity to at least one extract. A total of 333 positive reactions were observed. The degree of overall sensitivity was practically the same for both groups, with the Indianmeal moth extract eliciting the most positive reactions followed by the extracts of red flour beetle larvae, red flour beetle adults, rice weevils, fruit flies, confused flour beetles, sawtoothed grain beetles, and lesser grain borers.

The question arises as to where upwards of 25% of the general population might have acquired sensitivity to these insects. At one time or another, most people have had to clean out their cupboard as a result of an infestation by one or more stored-food pests. If the problem is bad enough (and recurrent), sensitivity could be related to inhalant or contactant allergens of insect origin. More likely, however, these allergies are the result of ingesting small quantities of insect material in food over a lifetime. Despite proficient methods of production and storage, trace amounts of insect material are going to find their way into our food. The Indianmeal moth and its relatives, for example, can be persistent and notorious pests wherever candy is manufactured or stored. Stored-product moths will also attack flour, pasta and dried fruit. Grain beetles and weevils are a constant threat to stored whole grain, and who hasn't opened a box of cake mix or cornmeal only to discover flour beetles infesting the contents. We are not inclined to eat food showing obvious signs of insect contamination, but we are more than likely getting occasional small doses of insect material in food we consider wholesome. For most people this level of exposure is medically inconsequential. For people with known allergies, especially those of the food and insect varieties, the matter becomes problematic. In the case of food insects, does the sensitized person exercise strict avoidance of this novel cuisine or take his or her chances?

Perhaps there are processes that largely diminish the potential threat of food allergies. One school of thought suggests that insect allergens in food are deactivated by cooking, yet, when five of the aforementioned insect extracts were heated at 100°C for one hour, positive skin reactions were again observed, although they were deemed less vigorous than those of the unheated treatments. In a 1964 study, Bernton and Brown heat-treated the extracts of cock roaches at 100°C for one hour and found that these allergens

likewise resisted deactivation. The idea that insect allergens are deactivated in the highly acidic environment of the stomach is also appealing until one considers the number of normally eaten foods that have been identified as potentially allergenic and whose allergens obviously survive digestion and cooking.

For most people, working with or eating food insects would pose little if any health risk, especially if they have no history of allergy to insects or other arthropods. Nonetheless, since sensitivity can be acquired with repeated exposure to an allergen, a measure of vigilance is in order. The person with known insect or arthropod allergies would be wise to exercise some caution. Cross-reactivity among related as well as taxonomically dispersed groups of insects has been established. There is also evidence for cross-reactivity among distantly related members of the Arthropoda suggesting the existence of common allergens within the phylum. So, if you are allergic to shellfish, you might want to reconsider the urge to "down " a plate of fried meal worms. As with anything, a little knowledge and common sense should keep you out of trouble. **Further Reading** Bauer, M. and R. Patnode. 1983. NIOSH, HETA, Report No. 82 002-1312. 36p.

Bellas, T.E. 1990. Occupational inhalant allergy to arthropods. *Clinical Reviews in Allergy*. 8: 15-29.

Brenner, R.J., K.C. Barnes, R.M. Helm, and L.W. Williams. 1991. Modernized society and allergies to arthropods. *American Entomologist*. 37(3):143-155.

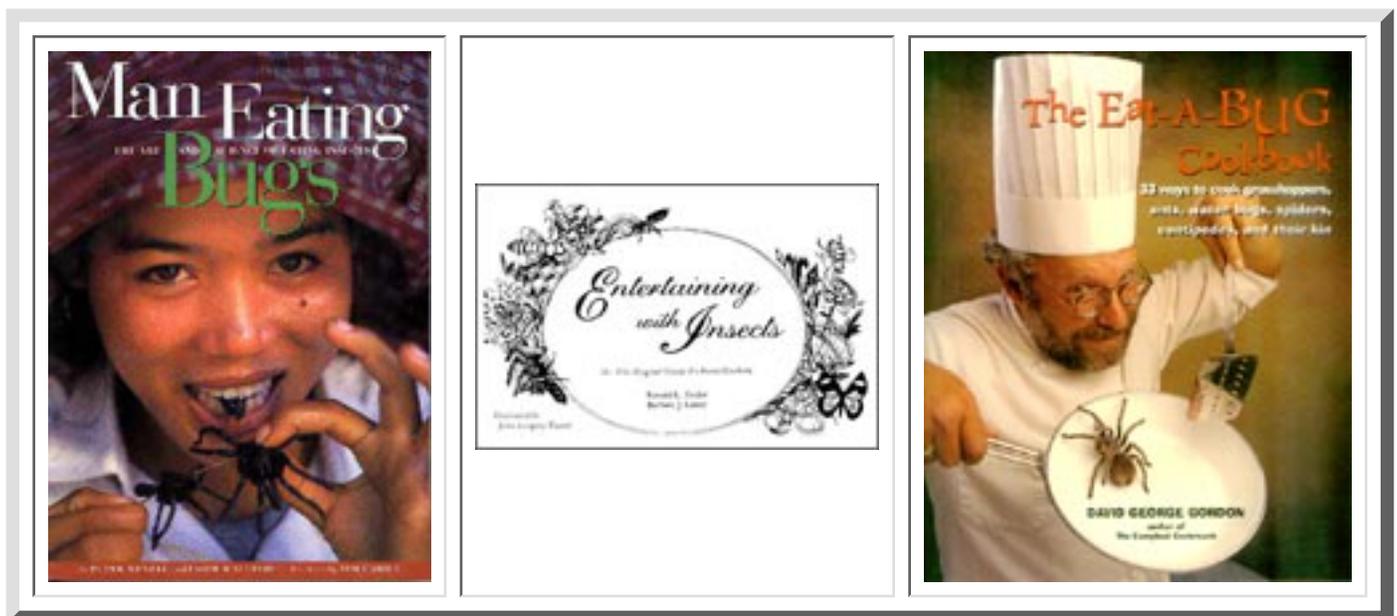
Bernton, H.S., and H. Brown. 1967. Insects as potential sources of ingestant allergens. *Annals of Allergy*. 25:381-387.

Gorham, R.J. 1976. Insects as food. *Bulletin of the Society of Vector Ecology*. 3: 11 -16.

LeClercq, M. 1969. *Entomological Parasitology*. Pergamon Press, New York. 158 pp.

Phillips, J.K. and W.E. Burkholder. 1984. Health hazards of insects and mites in food, pp. 279-292, in F.J. Baur (ed.), *Insect Management for Food Storage and Processing*. American Association of Cereal Chemists, St. Paul, MN.

Wirtz, R.A. 1980. Occupational allergies to arthropods - documentation and prevention. *Bulletin of the Entomological Society of America*. 26(3):356-360.



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Some Insect Foods of the American Indians: And How the Early Whites Reacted to Them

November 1994. Volume 7, Issue #3.

There is a small fly (*Hydropyrus hians*), belonging to the group known as "shore flies" (Diptera: Ephydriidae), that formerly bred in vast numbers in the alkaline waters of Mono Lake and other alkaline lakes in the California-Nevada border region. It was called kutsavi (or variations thereof) by the Paiute and other tribes. The fly pupae washed ashore in long windrows. J. Ross Browne¹, who visited Mono Lake in about 1865, told of encountering a deposit of pupae about two feet deep and three or four feet wide that extended "like a vast rim" around the lake:

"I saw no end to it during a walk of several miles along the beach It would appear that the worms [read fly pupae], as soon as they attain locomotion, creep up from the water, or are deposited on the beach by the waves during some of those violent gales which prevail in this region. The Mono Indians derive from them a fruitful source of subsistence. By drying them in the sun and mixing them with acorns, berries, grass-seeds, and other articles of food gathered up in the mountains, they make a conglomerate called cuchaba, which they use as a kind of bread. I am told it is very nutritious and not at all unpalatable. The worms are also eaten in their natural condition. It is considered a delicacy to fry them in their own grease. When properly prepared by a skillful cook they resemble pork 'cracklings.' I was not hungry enough to require one of these dishes during my sojourn, but would recommend any friend who may visit the lake to eat a pound or two and let me know the result at his earliest convenience There must be hundreds, perhaps thousands of tons of these oleaginous insects cast up on the beach every year. There is no danger of starvation on the shores of Mono. The inhabitants may be snowed in, flooded out, or cut off by aboriginal hordes, but they can always rely upon the beach for fat meat."

William Brewer², a professor of agriculture, had sampled kutsavi during a visit to Mono Lake in 1863. Noting that hundreds of bushels could be collected, he wrote:

"The Indians come far and near to gather them . The worms are dried in the sun, the shell rubbed off, when a yellowish kernal remains, like a small yellow grain of rice. This is oily, very nutritious, and not unpleasant to the taste, and under the name of koo-chah-bee forms a very important article of food. The Indians gave me some; it does not taste bad, and if one were ignorant of its origin, it would make fine soup. Gulls, ducks, snipe, frogs, and Indians fatten on it."

Somewhat earlier, in 1845, Captain John C. Fremont³ was impressed with a windrow of

kutsavi which he described as 10-20 feet in breadth and 7- 12 inches deep. Fremont related an experience told to him by an old hunter, Mr. Joseph Walker. Walker and his men had surprised a party of several Indian families encamped near a small lake who had abandoned their lodges at his approach, leaving everything behind them:

"Being in a starving condition, they were delighted to find in the abandoned lodges a number of skin bags, containing a quantity of what appeared to be fish, dried and pounded. On this they made a hearty supper; and were gathering around an abundant breakfast the next morning, when Mr. Walker discovered that it was with these, or a similar worm, that the bags had been filled. The stomachs of the stout trappers were not proof against their prejudices, and the repulsive food was suddenly rejected."

The Mormon cricket, *Anabrus simplex* (Orthoptera: Tettigoniidae), was another important insect food of the Indians, all over the West. It is not really a cricket, being more closely related to katydids. It is a large insect, about two inches in length, wingless, and it travels in large, dense bands. Bands may be more than a mile wide and several miles long, and with 20-30 or more crickets per square yard. It is sometimes damaging to crops or range vegetation and has been a pest target of the U.S. Department of Agriculture since before the turn of the century. Major Howard Egan⁴ described, in his delightful first-person style, a Mormon cricket drive that took place in about 1850. The procedure was basically to dig a series of trenches, each about 30 to 40 feet long and in the shape of a new moon, cover the trenches with a thin layer of stiff wheat grass straw, drive the crickets into the grass covering the trenches, and then set fire to the grass. As the drive began, Egan thought the Indians were going to a great deal of trouble for a few crickets: "We followed them on horseback and I noticed that there were but very few crickets left behind. As they went down, the line of crickets grew thicker and thicker till the ground ahead of the drivers [men, women and children] was black as coal with the excited, tumbling mass of crickets." After the grass had been fired, Egan observed that in some places the trenches were more than half full of dead crickets: "I went down below the trenches and I venture to say there were not one out of a thousand crickets that passed those trenches."

Once the drive was over, the men and children had done their part and were sitting around while the women gathered the catch into large baskets which could be carried on their backs. We should remember that this was long before the days of the women's' movement, as Egan says, in obvious admiration:

"Now here is what I saw a squaw doing that had a small baby strapped to a board or a willow frame, which she carried on her back with a strap over her forehead: When at work she would stand or lay the frame and kid where she could see it at any time. She soon had a large basket as full as she could crowd with crickets. Laying it down near the kid, she took a smaller basket and filled it. I should judge she had over four bushels of the catch. But wait, the Indians were leaving for their camp about three or four miles away. This squaw sat down beside the larger basket, put the band over her shoulders, got on her feet with it, then took the strapped kid and placed him on top, face up, picked up the other basket and followed her lord and master, who tramped ahead with nothing to carry

except his own lazy carcass. There were bushels of crickets left in the trenches, which I suppose they would gather later in the day."

Egan learned that the crickets were used to make a bread that was very dark in color. They were dried, then ground on the same mill used to grind pine nuts or grass seed, "making a fine flour that will keep a long time, if kept dry" (this was often referred to as "desert fruitcake" by early settlers). Egan's Indian companion told him "the crickets make the bread good, the same as sugar used by the white woman in her cakes."

There were other efficient methods of harvesting Mormon crickets. One of them was to drive the crickets into a stream, circa 1864. as described in the journal of Perter Gottfredson⁵: "The squaws [placed] baskets in the ditch for the crickets to float into. The male Indians with long willows strung along about twenty feet apart whipping the ground behind the crickets driving them towards the ditch [The crickets] tumbled into the ditch and floated down into the baskets They got more than 50 bushels." In this instance, service berries and wild currants were mixed with the crickets to form the loaves of bread. In a similar account of floating the crickets into baskets, John Young states that they were caught by the tons.

Another method was to simply scoop up the crickets by the bushel when they were clustered under vegetation and too cold to be active. Beatrice Whiting⁶ wrote of the Paiute: "The women went out early in the morning and caught them, were back by sunrise, and spent the rest of the day roasting, drying, and pounding them and putting them in bags to be cached for the winter."

There are few first-hand assessments of the flavor of Mormon crickets by early whites, for reasons that are apparent from the following excerpt from the reminiscences of Captain Joseph Aram⁷ who was in the Humboldt Sink in 1846: "We came to an Indian village, they came out in strong force but finding us friendly, they treated us kindly. They were digging roots on a creek bottom. They looked like a small red carrot. They gave us some that were cooked, they tasted like a sweet potato. They also offered us some dried crickets but those were declined, thinking they would not relish well with us." According to a modern account of the Honey Lake Paiute (Lassen County, California) by F. A. Riddell⁸, when Mormon crickets were made into a soup, the flavor was somewhat like that of dried deer meat.

A certain species of aphid even provided the Indians with sugar--in the form of the sweet honeydew it secreted. In the early Mission records of California, Pere Picola wrote in 1702: "In the months of April, May and June there falls with the dew a kind of manna, which solidifies and hardens on the leaves of reeds from which it is collected. I have tasted some. It is a little less white than sugar, but has all the sweetness of it." Some of the Fathers considered this "manna" a dispensation from Heaven.

John Bidwell⁹, a pioneer in the Humboldt Sink area in 1841, looked at the "manna" with a more discerning eye: "We saw many Indians on the Humboldt, especially towards the

sink. There were many Tule marshes. The tule is a rush, large, but here not very tall. It was generally completely covered with honeydew, and this in turn was wholly covered with a pediculous-looking [louse-like] insect which fed upon it. The Indians gathered quantities of the honey and pressed it into balls about the size of one's fist, having the appearance of wet bran. At first we greatly relished this Indian food, but when we saw what it was made of--that the insects pressed into the mass were the main ingredient--we lost our appetites and bought no more of it."

It wasn't until 1945 that the scientific identity of the aphid was determined. Volney Jones¹⁰ established its identity as *Hyalopterus pruni*, which is called the mealy plum aphid because it spends its winter phase on plum trees and other species of *Prunus*. In the spring and early summer it migrates to summer hosts, primarily the reed grass, *Phragmites communis*, where it produces the honeydew. The gathering of the honeydew seems to have been one of the annual seasonal rounds of activity of the Indians of the Great Basin. A family or band might camp for a short time near a stream or lake when the honeydew was ready. By piecing together various accounts of the manner of collection, Jones gives the following picture: "The collection seems to have been primarily the work of women and children. The reeds were cut and carried away from the water Cutting was done just after sunrise, and the reeds were spread out to dry during the warmer part of the day to dry the honey dew and make it brittle. During the afternoon the reeds were held over a hide and beaten with a stick to dislodge the deposits of honey dew which fell on the hide and could be collected The honey dew was rolled into balls, wrapped in leaves, and stored in baskets until needed."

Many other insects contributed on a regular basis to the Indian diet, among them grasshoppers, cicadas, ants and ant pupae, wasp pupae and prepupae, certain beetle larvae and several kinds of caterpillars. Edible insect harvest was a part of the annual rounds of food procurement. The Indians knew exactly where to go, and when, to find the desired insects, and large numbers of people and considerable planning, travel and effort were often involved in harvesting them (Sutton¹⁰). Some insects such as the Mormon cricket, grass hoppers and pandora moth caterpillars yielded a very high energy return for the energy expended in their harvest, often much higher than return rates from seeds or other plant food resources . And, when dried, the insects were storable for use as winter food.

In several localities, pandora moth caterpillars (*Coloradiapandora*) are still harvested by elderly Paiute. Called piuga by the Indians, the caterpillars feed primarily on the needles of the Jeffery pine and when fully grown descend the tree trunk to pupate in the soil. They sometimes occurred in great numbers and were collected in trenches dug around the bases of the trees. They were then roasted by mixing them with hot sand. Piuga is regarded by the Paiute as "a tasty, nutritious food that is especially good for sick people, much like our chicken soup," according to Elizabeth Blake and Michael Wagner¹², two researchers at the University of Northern Arizona. In former times, according to the late E. O. Essig¹³ (formerly an entomologist at the University of California-Berkeley), hungry whites who tasted piuga claimed that boarding with the early Californians "on the

American plan was not so good."

Finally, among the insect foods of the western Indian tribes, none were more widely harvested than grasshoppers. They were most often collected by using what hunters call a "surround." H. M. Chittenden and A. D. Richardson¹⁴, in their account of the life and travels of the French missionary, Father Pierre-Jean De Smet, described the "surround" used in a Shoshoco grasshopper hunt (circa 1850): "They begin by digging a hole, ten or twelve feet in diameter by four or five deep; then, armed with long branches of artemisia, they surround a field of four or five acres, more or less, according to the number of persons who are engaged in it. They stand about twenty feet apart, and their whole work is to beat the ground, so as to frighten up the grasshoppers and make them bound forward. They chase them toward the centre by degrees--that is, into the hole prepared for their reception., Their number is so consider able that frequently three or four acres furnish grasshoppers sufficient to fill the reservoir or hole."

A variation of the Shoshoco procedure was to build a fire covering 20 to 30 feet square. The people then formed a large circle around it and drove the grasshoppers onto the hot coals. Sometimes a field was simply set afire, and the scorched grasshoppers were picked up afterward. Or as in the case of Mormon crickets. grasshoppers could be collected by hand in the early morning while they were too cold to be active.

Edwin Bryant¹⁵ (circa 1848) provided one of the few assessments of grasshopper palatability by a white. following an encounter with Utah Indians, an occasion when three women appeared, "bringing baskets containing a substance, which, upon examination, we ascertained to be service-berries, crushed to a jam and mixed with pulverized grasshoppers. This composition being dried in the sun until it becomes hard, is what may be called the 'fruitcake' of these poor children of the desert. No doubt these women regarded it as one of the most acceptable offerings they could make to us. We purchased all they brought with them, paying them in darning needles and other small articles, with which they were much pleased. The prejudice against the grasshopper 'fruitcake' was strong at first, but it soon wore off, and none of the delicacy was thrown away or lost After being killed, they [the grasshoppers] are baked before the fire or dried in the sun, and then pulverized between smooth stones. Prejudice aside, I have tasted what are called delicacies, less agree able to the palate."

Nutritionally, insects are high in protein, fat (and thus energy) and many of the important vitamins and minerals. They have served as traditional foods in most cultures of non-European origin and have played an important role in the history of human nutrition not only in western North America, but in Africa, Asia and Latin America. As might be expected from our European cultural heritage, some early American whites looked with open disgust at the insect foods of the American Indians. It is interesting, though, that so often, as shown by the above examples, these cross-cultural encounters relative to food seemed dominated by feelings of mutual tolerance, curiosity and respect and were described with a sense of humor.

Gene R. DeFoliart, Editor

(Ed.: This article was originally written two or three years ago at the invitation of a travel and outdoor magazine published in California. When the magazine went on a reduced publication schedule, we got our manuscript back. Nobody likes to throw away a manuscript that's already written, so we decided that Newsletter readers might enjoy it.)

Addendum: This wasn't included in the original manuscript, but I think the second of the two paragraphs below quoting Father Kino (as found in Bolton 1919¹⁶) is one of the more humorous passages (because of Kino's religious candor) that I have encountered in the older North American literature. Kino labored in California, Arizona and Sonora. In the first paragraph, he is talking about aphid honeydew. The second paragraph is more on spiritual matters, and from Father Kino's account it seems questionable as to who was converting who:

"In order that sugar, which with so great artifice and toil is made over here, may not be lacking to the Californians, heaven provides them with it in abundance in the months of April, May, and June, in the dew which at that time falls upon the broad leaves, where it hardens and coagulates. They gather large quantities of it, and I have seen and eaten it. It is as sweet as sugar to the taste, and differs only in the refraction, which makes it dark." (II:56).

"All this fertility and wealth God placed in California only to be unappreciated by the natives, because they are of a race who live satisfied with merely eating By nature they are very lively and alert, qualities which they show, among other ways, by ridiculing any barbarism in their language, as they did with us when we were preaching to them. When they have been domesticated they come after preaching to correct any slip in the use of their language. If one preaches to them any mysteries contrary to their ancient errors, the sermon ended, they come to the father. call him to account for what he has said to them, and argue and discuss with him in favor of their error with considerable plausibility; but through reason they submit with all docility." (II:58-60)

- References**
1. Browne, J.R. 1865? Washoe Revisited. Notes on the Silver Regions of Nevada. Oakland, Calif.: Biobooks, pp. 111-114. (Also in *HarpersMonthly* 31:274-284;411-419.)
 2. Brewer, W.H. 1930. Up and Down California in 1860-1864. New Haven: Yale Univ. Press, p. 417.
 3. Fremont, J.C. 1845 (1988 reprint). The Exploring Expedition to the Rocky Mountains, p. 154.
 4. Egan, W.M. (Ed.). 1917. Pioneering the West 1846-1878: Major Howard Egan's Diary. Richmond, Utah: Howard Egan Estate, pp. 228-233.
 5. Gottfredson, P. 1874. Journal of Perter Gottfredson, From the Gottfredson Family History. Ms. on file, Utah State Hist. Soc., Salt Lake City, pp. 15-16.
 6. Whiting, Beatrice B. 1950. Paiute sorcery. Viking Fund Publs. Anthropol. No. 15, New York, pp. 17-19.
 7. Aram, J. 1907. Reminiscences of Captain Joseph Aram. *Jour. Amer. Hist.* 1, pp.

623-632.

8. Riddell, F.A. 1978. Honey Lake Paiute ethnography. Occas Papers, Nev. State Mus. 3(1):51-52.

9. Bidwell, J. 1890. The first emigrant train to California Century Mag. 19:106-130.

10. Jones, V.H. 1945. The use of honey-dew as food by Indians. The Masterkey 19:145-149.

11. Sutton, M.Q. 1988. Insects as Food: Aboriginal Entomophagy in the Great Basin. Ballena Press Anthropol. Papers. No.33, 115 pp.

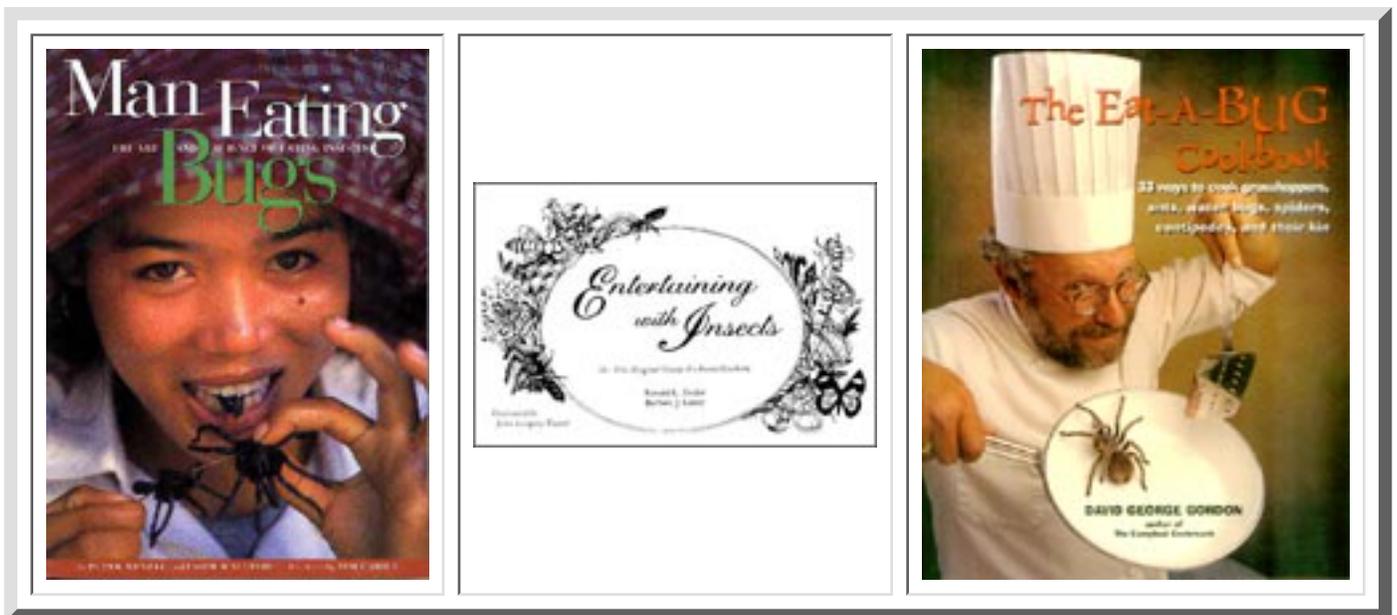
12. Blake, E.A.; Wagner, M.R. 1987. Collection and consumption of pandora moth, *Coloradia pandora lindseyi* (Lepidoptera: Saturniidae), larvae by Owens Valley and Mono Lake Paiutes. Bull Entomol. Soc. Amer. 33:23-27.

13. Essig, E.O. 1934. The value of insects to the California Indians. Sci. Monthly 38:181-186.

14. Chittenden, H.M.; Richardson, A.D. 1905. Life, Letters and Travel of Father Pierre-Jean De Smet, S.J., 1801-1873. New York: Harper, pp. 1032-1033.

15. Bryant, E. 1967. What I Saw in California . . . in the Years 1846, 1847. Palo Alto, Calif.: Lewis Osborne, pp. 162-163, 168.

16. Bolton, H.E. 1919. Kino's Historical Memoir of Pimeria Alta. 2 vols. Cleveland: Arthur H. Clark Co., Vol. II, pp. 56, 58, 60.



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
**Your donation is needed Now to print the next issue of the Food Insects
Newsletter.**

Thanks for your support!

Food Conversion Efficiencies of Insect Herbivores

March 1993. Volume 6, Issue #1.

**By Richard L. Lindroth
University of Wisconsin
Madison, Wisconsin**

In his classic children's book, *The Very Hungry Caterpillar*, Eric Carle describes the development of an increasingly voracious caterpillar, from egg hatch to metamorphosis into a beautiful butterfly. In addition to the character appeal of the larva and aesthetic quality of the illustrations, the book teaches some valuable lessons about the nutritional ecology of insect herbivores. The caterpillar hatched on Sunday: on Monday he ate through one apple, on Tuesday two pears . . . and on Saturday "he ate through one piece of chocolate cake, one ice cream cone, one pickle, one slice of Swiss cheese, one slice of salami, one lollipop, one piece of cherry pie, one sausage, one cupcake, and one slice of watermelon. That night he had a stomachache!"

What are the lessons we can learn? First, the older (and bigger) the insect is, the faster it eats. Indeed, consumption and growth rates increase exponentially with insect age. For example, leaf consumption by the forest tent caterpillar (*Malacosoma dissilia*) is approximately 0.05, 0.2, 0.8, 2.9 and 18.0 square inches for instars 1-5, respectively. Second, the older an insect is, the more diversified its diet may become. Most herbivorous insects are specialists, feeding on only one or a few related species for their entire life span. But some insects are generalists; notable among these is the gypsy moth (*Lymantria dispar*), which feeds on over 300 species of woody plants. For these generalist feeders, diets typically become increasingly diversified as maturity affords both greater mobility and increased capacity to detoxify the chemical defenses of plants. Third, for caterpillars, as for humans, some foods or combinations thereof may bring considerable discomfort.

These are basic principles of the discipline of nutritional ecology, which, in short, addresses what insects eat, why they eat what they do, and how efficient they are in doing it. The latter theme will be introduced in this paper. Several excellent reviews have been published on the topic and can be consulted for additional information (see References).

Insects, like all living organisms, require energy and nutrients to survive, grow and reproduce. The nutritional components (e.g., protein, carbohydrates, fats, vitamins, minerals) of ingested food may or may not be digested and absorbed. The proportion of ingested food that is actually digested is denoted by AD, the assimilation efficiency (also called "approximate digestibility"). Of the nutrients absorbed, portions are expended in the processes of respiration and work. The proportion of digested food that is actually

transformed into net insect biomass is denoted by ECD, the efficiency of conversion of digested food. A parallel parameter, ECI, indicates the efficiency of conversion of ingested food ($ECI = AD \times ECD$). In short, AD indicates how digestible a food is, whereas ECD and ECI indicate how efficient a herbivore is in converting that food into biomass. These efficiency values may be calculated for specific dietary nutrients as well as for the bulk diet. For instance, nitrogen use efficiencies are informative because levels of plant nitrogen (an index of protein) are often times limiting to insect performance.

Food conversion efficiencies may vary considerably within a species. One cause of such variation involves homeostatic adjustment of consumption rates and efficiency parameters such that an insect can approach its "ideal" growth rate even with foods of different quality in various environments. For example, insects that experience reduced ECDs due to increased respiratory costs may be able to compensate by increasing consumption rates or digestion efficiencies (ADs). Not all changes are homeostatic, however. For instance, many insects increase food consumption rates in response to low concentrations of critical nutrients such as protein. Increased consumption will accelerate passage of food through the gut and thereby reduce ADs. In our work with the gypsy moth we found that larvae reared on a protein deficient diet increased consumption rates by 3-4-fold, but overall ADs declined by nearly as much. Other nonhomeostatic changes in efficiency values may occur in response to plant allelochemicals. For example, compensatory feeding to increase intake of a limiting nutrient may simultaneously increase exposure to plant toxins, which in turn may reduce ECDs. In practice, however, it can be quite difficult to ascertain "cause" and "effect" responses with efficiency parameters. Does the insect eat more because digestibility is low, or is digestibility low because the insect is eating more? Efficiency parameters are so closely physiologically related that determination of "cause" and "effect" is not a trivial matter.

Intraspecific variation in food conversion efficiencies may also be related to insect development. ADs generally decrease, whereas ECDs increase, from early to late instars. In other words older larvae digest their food less completely, but that which they do digest is more efficiently utilized for growth. One study showed that values for AD and ECD change from 46% to 27% and 38% to 60%, respectively, for early and late instars of the desert locust (*Schistocerca gregaria*). Factors contributing to such changes are still largely unknown, but may include shifts in food selection, digestive physiology, metabolic rates, and body composition.

Food conversion efficiencies also vary greatly among species, and this variation is more closely related to feeding guilds than to taxonomic affinity. Insects that feed on nitrogen-rich foliage generally have higher consumption rates and assimilation efficiencies than do insects that feed on nitrogen-poor foliage, and as a consequence grow and develop much faster. The classic example here is the difference between forb- and tree-feeders. Forb leaves typically have high levels of nitrogen and water, whereas tree leaves have lower levels of those constituents and higher levels of poorly digestible compounds such as cellulose, lignin and tannins. Accordingly, insects that feed on mature tree leaves exhibit growth rates half or less than those insects that feed on forbs. The relatively poor nutritional quality of tree foliage has had important consequences for

insect life histories. In temperate regions forb feeders often have many more generations per year than do tree feeders. Among tree-feeders, numerous species have adapted to emerge and feed only on the especially nutritious early spring foliage, and thus have only one generation per year.

Other examples that demonstrate how the various efficiencies are strongly influenced by food quality include wood- and seed-feeding insects. Wood is tough and nutritionally poor. Thus wood-chewers have slow rates of consumption and digestion (much of which is accomplished by symbiotic microbes). The combination of these factors precludes all but slow growth rates in wood-feeders. In contrast, seeds are high in readily digestible carbohydrates and protein and low in fibrous material. Thus seed-feeders exhibit high ADs. Growth rates are nonetheless only low to moderate, due to low consumption rates and low ECDs. Low ECDs may result from a requirement of these insects to metabolize digested food in order to produce water.

Understanding of these basic principles of nutritional ecology can enhance our appreciation of insects as a food resource. Environmentalists and others concerned about nutrition and world food resources have long decried the reliance of some people on large animal protein (e.g., beef) as a dietary staple. The reasoning is that production of such high-quality protein is very inefficient; more food would be available if people ate the grain instead. This debate is complex and beyond the scope of this paper. Suffice it to say, however, that a major reason that large animals are inefficient in transforming plant biomass into animal biomass is that they have very high maintenance costs (i.e., low ECDs). Large amounts of energy and nutrients are used to maintain constant body temperatures. Insects, being "cold-blooded," are more efficient in transforming plant biomass into animal biomass.

Understanding of basic nutritional ecology may also improve selection of insect and plant species for large-scale insect production. For example, production will be more rapid with forb feeders than with tree-feeders and with leaf-feeders than with wood-feeders, other environmental factors equal. Want to know what plant/insect characteristics may be limiting production? Some simple input/output and growth measurements will tell whether production is limited by low consumption, poor digestibility, or inefficient conversion of assimilated food into body mass. Different corrective measures may be available for each situation. **Acknowledgment** This article benefited greatly from the content and inspiration of excellent reviews by Frank Slansky and Mark Scriber. **Further Reading**

Scriber, J.M., and F. Slansky. 1981. The nutritional ecology of immature insects. *Annual Review of Entomology* 26:183-211.

Slansky, F., and J.M. Scriber, 1982. Selected bibliography and summary of quantitative food utilization by immature insects. *Bulletin of the Entomological Society of America* 28:43-55.

Slansky, F., and J.M. Scriber. 1985. Food consumption and utilization. Pp. 87-163, in G.A. Kerkut and L.I. Gilbert (eds.), *Comprehensive Insect Physiology, Biochemistry and Pharmacology*. Vol. 4. Regulation: Digestion Nutrition Excretion. Pergamon Press, N.Y.

A Follow-up Interview with Dr. Lindroth

The Newsletter has never used this journalistic technique before, but it seems a good way of getting the most out of our invited experts while we have their attention. We'll designate the questioner as The FIN(The Food Insects Newsletter). It's too bad we're not in the fish business because it would make a great acronym.

The FIN: First, thank you Dr. Lindroth for accepting our invitation to set forth some basic principles of insect food conversion efficiency in the Newsletter and for taking additional time to respond to some questions. The food conversion efficiency of edible insects has important ecological and environmental implications. First question. Remembering that edible insects furnish not only protein, but fats, vitamins, and minerals, and, as a very high proportion of growth occurs in the last two larval or nymphal instars (about 95% in lepidopterous larvae as shown with your example, *M. disstria*), can we assume that the combined ECI for the last two instars is a valid (and the simplest) statistic for comparing food conversion efficiency (let's shorten it to FCE) between or within species in different situations? A second, related question. Do ecologists have any "rule-of-thumb" ECI level that is considered good, or is everything comparative and dependent on the quality of the food source?

Dr. Lindroth: If I had to select only one efficiency measure, ECI would be a good candidate, as it represents efficiencies of both digestion and how well digested food is converted to biomass. Bear in mind though, that insects can compensate for low ECIs to some degree simply by increasing their feeding rates. Thus two insects could have the same growth rate; one achieves it by eating less but being very efficient with what it eats, the other by eating more but being less efficient. Because so much of an insect's feeding and growth occurs in its last few instars, FCEs from that period are a very useful comparative measure. Another caution here is that dietary characteristics (nutrient deficiencies or toxins) may affect younger instars more than older instars, and if the impact is great enough, you'll never see those insects as older instars.

I'm reluctant to suggest what ECI values may be "good" or "bad"; they're really more useful in a comparative sense. What is "good" for one insect feeding on one substrate may or may not be "good" for another insect feeding on another substrate. What is most valuable is to compare different species (or races) feeding on the same food, or individuals of one species feeding on different foods .

The FIN: You pointed out that forb-feeders show higher FCEs than tree leaf-feeders because forbs are higher in nitrogen and water and lower in such hard-to-digest compounds as cellulose and lignin. I've seen combined ECI data (Scriber's) on only one forb-feeding edible insect, *Spodoptera eridania* (the southern armyworm). When tested on 10 varieties of alfalfa, combined ECIs ranged below 15% on six varieties, from 15.5-20.3% on three others, and showed an incredible 29.8% on Vernal alfalfa. Two questions. Do you know of any vertebrate meat animal that can come anywhere close to 29.8%? And secondly, how do you explain such great ECI differences at the plant varietal level?

Dr. Lindroth: Yes. As you'll see below, poultry can attain this level of efficiency. But their food source is grain, which is even richer than alfalfa.

Considerable variation in ECIs at the plant varietal level has not been well-studied, but may not be as unusual as one might expect. For example, in a study with gypsy moth larvae feeding on individual aspen trees from a common habitat, we found ECI values that ranged from 6% to 16%. In our case among-tree variation in levels of phenolic toxins greatly influenced ECI's and subsequent larval growth rates. I'm not at all surprised that differences of the magnitude you describe exist among plant varieties. Those differences probably result from differences in chemical or physical attributes of the varieties.

The FIN: In scanning ECI data, one can dream up some wild schemes. For example, Scriber also tested *S. eridania* on five kinds of clover and trefoil. The highest combined ECI was on *Trifolium agrarium* (yellow blossom sweet clover), 23.6%. Now, commercial pond fish producers are looking for good sources of long-chain w3 polyunsaturated fatty acids, and lepidopterous larvae, in general, would be a rich source if they could be feasibly exploited. Yellow blossom sweet clover must do very well on poor soils, because it's along roadsides all over the country. And *S. eridania* has multiple generations per year. Maybe it would pay the fish growers to hire a young entomologist (or maybe put some research money into your lab) to look into the possibilities. Maybe the armyworms should be harvested at the end of the penultimate (second to last) instar. Scriber's data showed an incredible ECI of 56.9% for that instar on YBSC (it was even higher, 58.3%, on Vernal alfalfa.)

Dr. Lindroth: You're right, the possibilities are great. As you know better than I, a minor shift in one's thinking about insects as food can open up many new avenues of research and application.

The FIN: Unfortunately, many more of the major edible insect groups seem to feed on trees and grasses, or even wood, than feed on forbs. Tests on two species of edible grasshoppers, *Locustana migratoria* and a species of *Melanoplus*, fed on several kinds of grasses showed combined ECIs in the range of 10-15% and 8-11%, respectively. Two questions. How do ECIs in the range of 10-15% compare with other grass-caters such as cattle? (I believe there is a rule-of-thumb in cattle husbandry that 15 lbs of hay puts on a pound of gain). As grasshoppers are generalists, if they were reared on forbs, should we expect higher ECIs?

Dr. Lindroth: As I alluded to in the article, FECs are generally higher for insects than for vertebrates. One must be careful in making such comparisons, however. One problem is that insect values are reported on the basis of dry weights, whereas livestock values are reported as "gain" which typically includes 70% water. After adjusting for water weight, ballpark figures for efficiency of gain are seen below. Clearly, the insects are superior to mammals when fed the same food. FCEs of vertebrates can approach or even surpass those of insects when they are fed especially nutritious and digestible food such as grain.

Chicken (grain) 30%

Pigs (grain) 11 %

Beef (grain) 5%

Beef (grass) 3%

About rearing grasshoppers on forbs: I would expect higher ECIs than when reared on grass.

The FIN: Larvae of the giant silk moths (Family Saturniidae) are a major food insect group, especially in Africa. Most of these are tree-feeders, and as you indicated in general for tree-feeders, most have only one generation per year. I don't know of any ECI data on African species, but data by Scriber and Feeney on nine North American species on 21 host species showed combined ECIs ranging from 7.1 to 15.8 (ECIs above 10 on nine of the 21 larva/host combinations). Doesn't it seem that, even with ECIs at the relatively low range of 10-15%, if the forest was properly managed for caterpillar (and termite) preservation (as has been recommended in several instances by researchers in Africa), it would be about as productive for animal agriculture as grassland? Is there a short answer for this complex question, or is the question not as complex as it seems?

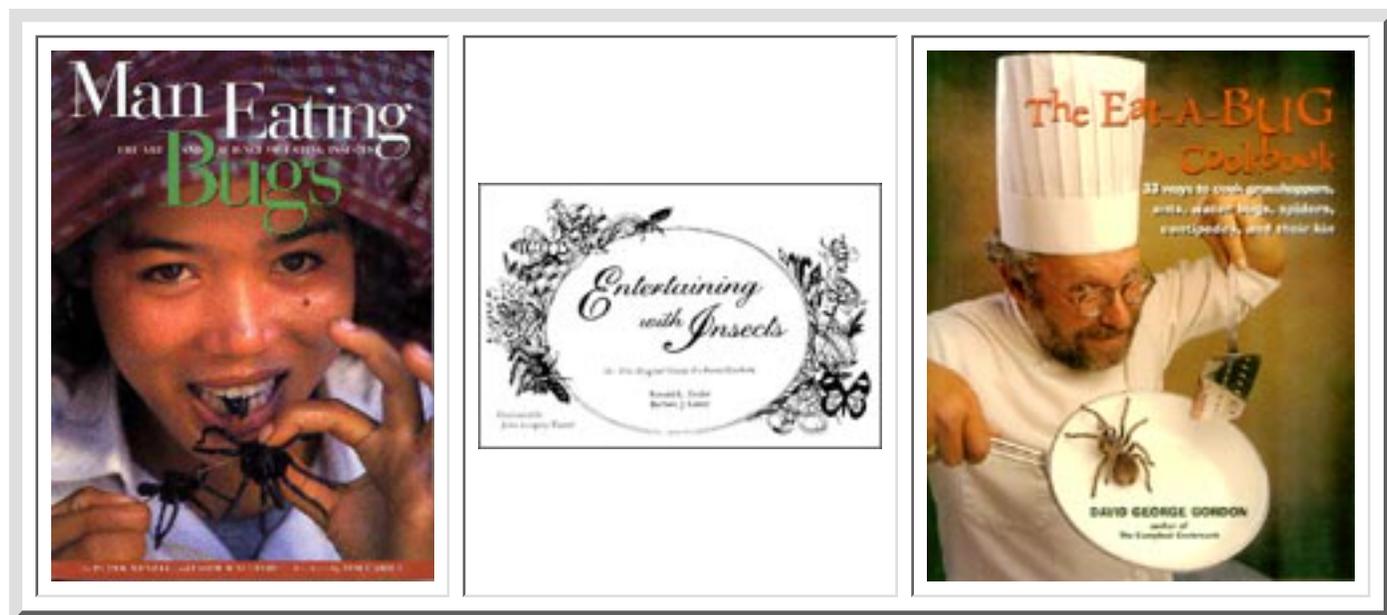
Dr. Lindroth: On the surface the reasoning seems sound. But a number of complicating factors come to mind; the answer really is complex. For example, because grasslands have coevolved with large grazing mammals grasses can recover remarkably well from extensive grazing. Remove the same percentage of green foliage from a forest habitat and you'll not have the forest for long. And then there are the practical matters of harvest, etc. It is probably much easier to harvest 1000 lbs of large animal biomass from a grassland than an equivalent amount of insect biomass from a forest! This is not to say that management of forests for insect production should not be considered, just that the comparison with grassland systems is fraught with problems.

The FIN: Several important food insect groups develop in wood, including decaying or rotten logs. As would be expected, most have long life cycles, one or more years, for example in the beetle families, Buprestidae and Cerambycidae. Palm weevils of the genus *Rhynchophorus* (Family Curculionidac). however, complete development in only two or three months in palm logs. Is this an exception to the "feeding guilds" principle that you mentioned (feeding guilds more important than taxonomic affinity in determining food conversion efficiency), or what would explain such relatively fast development on such poor food?

Dr. Lindroth: This is an interesting example. I don't know the answer, but I can hazard a guess. Most trees are dicotyledons and the woody tissue of these species is loaded with lignins, tannins, etc. Palm trees are monocotyledons: they are more closely related to Kentucky bluegrass than to oaks or maples. I know next to nothing about the chemical composition of palm logs, but would suggest that they have higher levels of particular nutrients (e.g., nitrogen, sugars) and/or lower levels of lignins and tannins than occur in the wood of dicots.

The FIN: Thanks again, Rick, and a final question. Are forbs and herbs the same thing?

Dr. Lindroth: Not quite. Herbs are non-woody plants, including both monocots and dicots. In temperate regions they "die back" to ground level at the end of the growing season. Forbs are herbs that are not grasses (dicots).



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Large-scale Feed Production from Animal Manures with a Non-Pest Native Fly

July 1992. Volume 5, Issue #2.

By D. C. Sheppard, Ph.D.

University of Georgia

Coastal Plain Experiment Station

Tifton, GA 31793

The black soldier fly, *Hermetia illucens* (L.), is an attractive manure management agent that can produce large quantities of high-quality animal feedstuff, control house flies and reduce manure residue by half. Based on a 480 hen pilot scale test (Sheppard et al 1992) a modest-sized 20,000 hen caged layer facility could collect over 13 tons of larvae from June through December. Sixty thousand hens per house is now the preferred size and farms usually have multiple houses. This 13 ton production estimate from a small commercial unit is probably low. Future systems will be managed better than this first trial. Early season collections were not measured, and a late summer manure clean-out lowered production. Deeper manure basins in future systems should allow utilization of manure collected during the winter.

Prepupal soldier flies were self-collected as they sought pupation sites and crawled out of the manure basin. A 40° slope on one wall of the basin directed these mature larvae. They crawled into a 2 inch slit in a 6-inch diameter PVC pipe at the top of this slope. Then they continued to crawl to a container at the end of the pipe. In the experimental facility they easily negotiated a 40-foot length of pipe. The masses of exiting prepupae sometimes clogged a 4-inch pipe, which was used at first, but the 6-inch pipe worked well. The opposing 12-inch wall was vertical and kept the masses of larvae off of the house's central walkway. If not contained, these masses of larvae can cause aesthetic problems.

Newton et al (1977) found that manually collected soldier fly larvae contained 42% crude protein and 35% fat. Self-collected prepupae should be of higher feed value since they average larger, have emptied their gut and have more stored fat. Tests are underway to determine the feed value of the self-collected prepupae. Manually collected larvae have been studied, and show promise as a feed ingredient for swine (Newton et al 1977), poultry (Hale 1973) and fish (Bondari and Sheppard 1981). Swine relish the fresh larvae.

Little is known about adult biology. The only adults commonly seen are newly emerged adults and ovipositing females. Eggs are laid in batches of about 500 in dry cracks or crevices above the chosen larval media. Other adults apparently live in a wild environment and their habits are largely unknown. They do not try to enter houses and are usually not a problem. In 15 years of investigating this insect, I can remember only one complaint

about adults entering a residence.

Besides offering a potential feed source, soldier fly larvae provide two other significant benefits: house fly control and about a 50% reduction in manure volume (Sheppard 1983). The larvae repel ovipositing female house flies (Bradley and Sheppard 1984) and house fly larvae that do attempt to compete with dense populations of soldier fly larvae usually die. In the pilot scale manure management test mentioned earlier no house fly breeding occurred from June to December. Many Georgia egg producers use this insect for house fly control without any management to contain the soldier fly larvae.

The economics of this manure management system are attractive. Construction costs should be less than the currently popular flush systems and resource recovery is greater.

The only insecticide able to approach the level of control achievable with this system is Larvadex, when house flies are susceptible. With low levels of Larvadex resistance, soldier fly larvae provide house fly control superior to Larvadex (Sheppard et al 1989). Larvadex costs an egg producer 10 cents per hen if used for 6 months. Thus a conservative value to place on house fly control with this soldier fly system is 10 cents per hen per year. Manure removal and surface application costs 65 cents per hen, per year in shallow pit houses (Ritter 1992). Assuming 50% reduction in manure build-up through soldier fly activity (Sheppard 1983) for half the year gives a 25% reduction on an annual basis. Actual reduction may be much more if manure basins deeper than 12 inches are used, and soldier fly larvae can digest manure from the previous winter. At any rate, the conservative 25% reduction estimate produces an economic benefit of $0.25 \times 65 \text{ cents} = 16.2 \text{ cents per hen per year}$. This assumes the manure is a liability, which it generally is in high production areas. Value of the dried larval feedstuff has been estimated at \$340-400 per ton. At 44% dry matter, the fresh larvae are worth about \$160 per ton or 8 cents per pound. So, the 1.32 pounds of larvae produced per hen per year are worth 10.6 cents. Adding the easily measured economic benefits of this system yields a total value of 36.8 cents per hen per year. This would net our small hypothetical 20,000 hen egg producer an extra \$7,360. This system should easily adapt to swine waste management, and a trial is currently underway. Soldier flies could be used to degrade many other organic wastes. They have even been found breeding in ketchup and formalin preserved tuna (May 1961), and can eliminate house fly breeding in privies (Kilpatrick and Schoof 1959).

References cited: Bondari, K., and D.C. Sheppard. 1981. Soldier fly larvae as feed in commercial fish production. *Aquaculture* 24: 103.

Bradley Susan W., and D.C. Sheppard. 1984. House fly oviposition inhibition by larvae of *Hermetia illucens*, the black soldier fly. *J. Chem. Ecol.* 10:853-859.

Hale, O.M. 1973. Dried *Hermetia illucens* larvae (Diptera: Stratiomyidae) as a feed additive for poultry. *J. Ga. Entomol. Soc.* 8:16-20.

Kilpatrick, J.W., and H F. Schoof. 1959. Interrelationship of water and *Hermetia illucens* breeding to *Muscadomeschca* production in human excrement. *Am. J. Trop. Med. Hyg.* 8: 597-602.

May, B.M. 1961. The occurrence in New Zealand and the life history of the soldier fly *Hermetia illucens* (L.)(Diptera: Stratiomyidae). *N.Z.J. Sci.* 4:55-65.

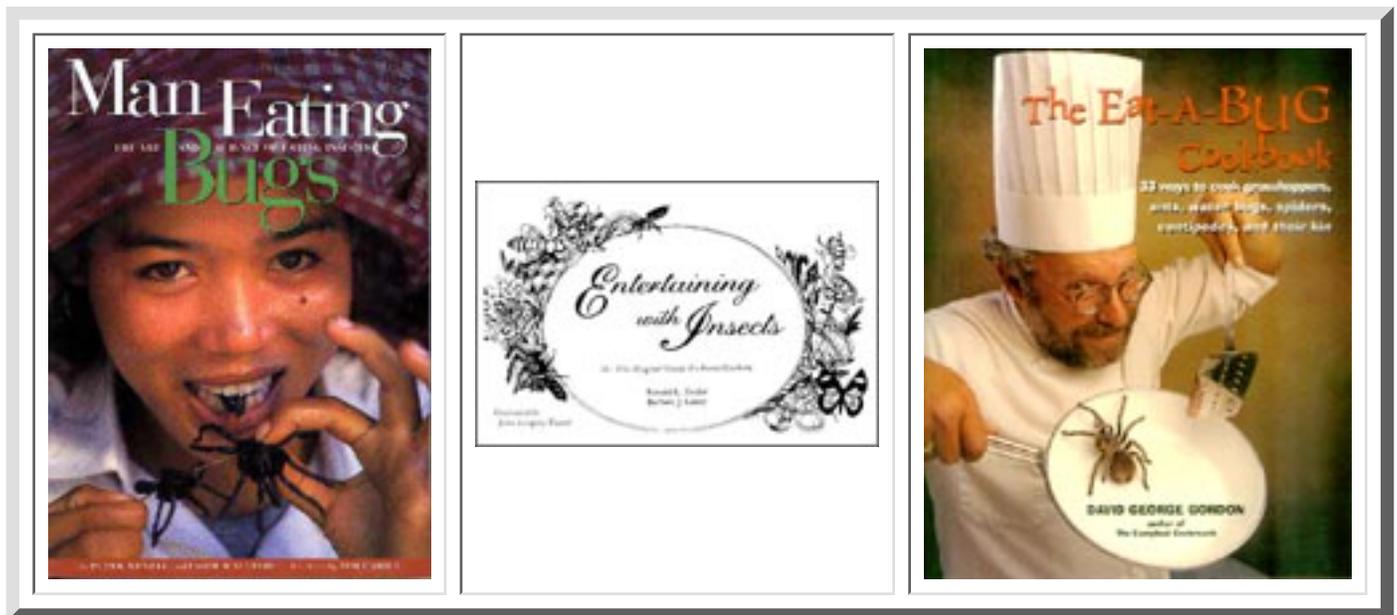
Newton, G.L., C.V. Booram, R.W. Barker, and O.M. Hale. 1977. Dried *Hermetia illucens* larvae meal as a supplement for swine. *J. Anim. Sci.* 4:395-399.

Ritter, W.F. 1992. Selecting poultry waste systems increasingly important. *Feedstuff* 63: 30-32,41-42.

Sheppard, C. 1983. House fly and lesser house fly control utilizing the black soldier fly in manure management systems for caged laying hens. *Environ. Entomol.* 12: 1439-1442.

Sheppard, D.C., N.C. Hinkle, J.S. Hunter III, and D.M. Gaydon. 1989. Resistance in constant exposure livestock insect control systems: a partial review with some original findings on eyromazine resistance in house flies. *Fla. Entomol.* 72: 36-369.

Sheppard, C., L. Newton and S. Thompson. 1992. Manure management for house fly control, volume reduction and feed production, using the black soldier fly. *Proc. of the Nat. Organic Farming Sym., Pacific Grove, California Jan 22-23, 1992.*



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
**Your donation is needed Now to print the next issue of the Food Insects
Newsletter.**

Thanks for your support!

They Ate What?

(Catching up on the magazines)

November 1991. Volume 4, Issue #3.

By Gene R. DeFoliart

Department of Entomology

545 Russell Laboratories

University of Wisconsin

Madison, WI 53706

The above is the title of an article published in the Cuisine Section of American Way, the official mag of American Airlines. I found it on my desk one day last spring. Dr. Jane Homan, who has flown to just about everywhere in her travels for the UW Office of International Agricultural Programs, had attached a note: "When this starts showing up in airline magazines it must be getting 'chic'! !

Author Dick Reavis, a contributing editor of American Way, certainly makes it sound so, with "creepy creatures" now considered by some as the height of haute cuisine. According to Reavis; "It's in style: Now that Mexican restaurants are popular from Bangor to San Diego, the cognoscenti of real Mexican food are seeking out restaurants that serve unadulterated, un-Europeanized food from Central America and Mexico. Pre-Hispanic or pre-Columbian food it's called, the kinds of dishes Mexicans ate before the region was subdued by the Spanish. Worms [read insect larvae], cooked or live, are a big part of pre-Hispanic cuisine, and eating them has become a rite of passage for those who would be intimate with the Mexican past."

One restaurant providing this kind of fare is Don Chon's, near the historic La Merced market in Mexico City, "a back-street landmark for rustics and adventurous connoisseurs." It's unpretentious, "but diplomats, ambassadors, and the theater crowd flock there at lunchtimes." The owner of Don Chon's, Leopoldo Ortega, notes that back in the fifties, the restaurant was mainly patronized by the vendors who came to La Merced from the countryside. Because pre Hispanic food has become relatively expensive, tourists and people with bohemian tastes now outnumber the country folk, who, Ortega says, have "become our sellers more than our customers." A hint of how expensive is given by Reavis who ordered a plate of red agave worms [larvae of the moth, *Xyleutes redtenbachii*]; price, 30,000 pesos or about \$11, nearly two times the daily wage of most Mexicans. (Reavis also tried a side dish of live worms and describes the indelicate maneuvers required to remove one when it bit him.)

Reavis concludes his article with the following paragraph: "In my opinion, the finest pre-Hispanic delicacy at Don Chon's (and also sometimes served at the highbrow Prendez restaurant downtown on 16 de Septiembre Street, a place not known for

pre-Hispanic food; that it even offers such a dish proves the trend) is escamoles in green sauce, sprinkled with diced onion and bits of cilantro. Escamoles are the larvae of black ants. When boiled, they look like cottage cheese. Rank amateurs scoop them up with a spoon, and ordinary Mexicans with a corn tortilla. But the blasé know, and the bold quickly see, that a torta de ahuatli - a wafer made of batter and the eggs of a swamp fly [read Mexican caviar, eggs of several species of aquatic Hemiptera, or true bugs] - does the trick in higher style. The season for escamoles is in the spring. By then, Don Chon's will also be serving white worms as big as your fingers. I don't know if they bite, but take my advice: They're tasty when toasted, but I wouldn't eat them alive."

- If we are looking for glamour, however, we needn't settle for the airline magazines. How about the 1989 25th Anniversary Swimsuit Issue of Sports Illustrated! Now we're talking sun and surf and the Pacific Coast of Mexico. But, according to the author, it is the worst place in the world to be a grasshopper. A recipe is offered (page 260) for a small species sometimes served for lunch in Oaxaca:

Ingredients

About 1000 grasshoppers (the younger the better)

1/2 cup chili sauce

pinch of salt

garlic

onion

1 lemon

1 cup guacamole

6 tortillas

Directions: Soak the grasshoppers in clean water for 24 hours. Boil them, then let dry. Fry in a pan with garlic, onion, salt and lemon. Roll up in tortillas with chili sauce and guacamole. According to the author, "Serves six if you can fund six."

- If one prefers not glamour but a more sedate and intellectual approach, one can consult Natural History magazine, specifically food historian Raymond Sokolov's column, "A Matter of Taste." Three times in the past two years, Sokolov has dipped into things entomophagous. The first was in the August 1989 issue in an article titled, "Before the Conquest" and subtitled "Thousands of Mexican dishes could not have existed before Cortes." Sokolov notes that Mexico offers a better opportunity than most cultures do for precisely tracing the evolution of a national cuisine. The evidence comes from many sources; the Aztecs, who wrote about their own civilization; from pre-Columbian and colonial Mexican and; from ethnographic documents produced at the direction of the Spaniards soon after the conquest; and from survival of ancient foodways that are still abundantly practiced in Mexico today.

The single most important work was the monumental General History of the Things of New Spain (*Historia general de las cosas de Nueva España*), by the Franciscan friar Bernardino de Sahagun. From Sahagun it is known that the Aztec diet was based on corn

and tortillas, tamales and plenty of chilies in many varieties. Sokolov describes how this diet was influenced by the importation of European-style foods that began with Cortes, and states that it is a wonder "that so much of what Mexico ate before Cortes is still available today and popularly consumed, from cactus paddles to chilies, from tadpoles to various worms and bugs."

The article concludes with a recipe for Salsa de Jumilies (Mountain chinch sauce) taken from Adela Fernandez's book, *La Tradicional Cocina Mexicana y sus Mejores Recetas*, Panorama Editorial, Mexico, 1989. We have not reprinted this recipe because we doubt that very many Americans are yet ready for it. Jumilies belong to the "stink bug" family, Pentatomidae, Order Hemiptera.

- In the September 1989 issue of *Natural History*, Sokolov follows up on the previous month with an article titled "Insects, Worms, and Other Tidbits" and subtitled "The Mexican diet, before Cortes, obtained high-quality protein from lowly sources." He emphasizes that "authentic" cuisine "virtually everywhere" is not the immobile tradition that traditionalists wish it to be," and furnishes an impressive list of foods contributed by the New World to the Old, including potato, tomato, corn, chocolate, squashes, beans and many others. Some of these New World foods have had great nutritional impact, for example, the sweet potato, peanut and the chili pepper in China, and manioc, corn, peanuts and pumpkins in Africa.

Relative to Mexico when Cortes appeared Sokolov notes that the country " was a major world civilization with a vigorous culture that continues to challenge imported European culture today. [Enough native Mexicans have survived] to carry on local food traditions in tandem with the new ideas and foods from Spain and the Spanish Empire." Insects of many species are a prominent part of these local food traditions, but Sokolov devotes the most space to the maguey worm, larvae of the giant skipper butterfly, *Aegiale hesperiaris*, which are also called palomillas del maguey (maguey squabs), champolocos, meccuilines and pecahs. Sokolov paraphrases the account of these larvae in Teresa Castello Yterbide's *Presencia de la Comida Prehispanica* (Banamex, 1986), as follows: "Larvae harvesters poke about among the maguey's lower leaves, looking for the telltale tunnels at the base of the leaves near the outer edges. Working very carefully with a machete, so as not to disembowel the larvae unwittingly, they cut open the leaf. To extract the larvae whole, they use hooks formed by cutting thin strips from the edge of a maguey leaf. Then they remove all its spines except for one at the end of the strip. This they form into the hook they use to catch the larvae by the head. To store the larvae, they make pouches with the skin of a tender new maguey leaf, which is called mixiote (it gives its name, synecdochically, to a dish made of chunks of marinated meat wrapped in mixiote pouches and steamed).

To cook the larvae, people sometimes just put a whole gusano (larvae)-filled mixiote over coals or hot ashes, or they might just put the larvae directly on a bakestone until they swell and stiffen, turning golden brown and crunchy. And this is not some quaint account of a long-forgotten practice. Castello Yterbide nonchalantly mentions that maguey larvae can be obtained in April in the market of San Juan in Mexico City or in Actopan and

Ixmiquilpan (two villages of the state of Hidalgo) or in farm hamlets around Mexico City.

Relative to other insects, Sokolov notes that the eggs of water bugs (moscos de pajaro) (Hemiptera) are still harvested in the same manner described by Sahagun. Today, they are toasted, ground up and made into little cakes held together with turkey egg. In the late 18th Century, they were apparently a garnish for the festive dish called revoltijo, served on Christmas Eve and at the vigil of Thursday night of Holy Week. Other insects still eaten include locusts, available year-round at markets in Oaxaco and Atlixco, toasted and eaten with tortillas and a sauce of chili pasilla; mountain chinch bugs, eaten toasted or living; oak-boring beetles which are popular as snacks among Mixtec peasants; ant larvae and pupae (called ant eggs); and in Jungapeo, Michoacan, wasps. Two excellent photographs (one of maguey worms) accompany the article. (Ed.: It can be noted that Dr. Julieta Ramos-Elorduy, who has done extensive research on entomophagy in Mexico, has reported that more than 200 species of insects are still eaten in Mexico [personal communication, 1986]).

Raymond Sokolov's third venture into entomophagous topics occurred in the July 1991 issue of Natural History when he drew the difficult assignment of trying to write a food column relevant to the remainder of the July issue, which was devoted entirely to mosquitoes. In this one, he draws some material from past issues of The Food Insects Newsletter, particularly on bakuti (made from brood of the giant honey bee in Nepal, as described by Professor Michael Burgeu in the November 1990 issue). In the process, Mr. Sokolov makes some nice comments about the Newsletter, which immediately stamped him as my favorite food author. But, if you are wondering about the mosquito connection, even a gifted writer like Mr. Sokolov encounters some difficulty. After flowery dissertation at some length about the joys of fly-tying, the beauty of mountain streams, and other interesting diversions, he finally settles for the basic fact that trout eat mosquitoes and we eat trout.

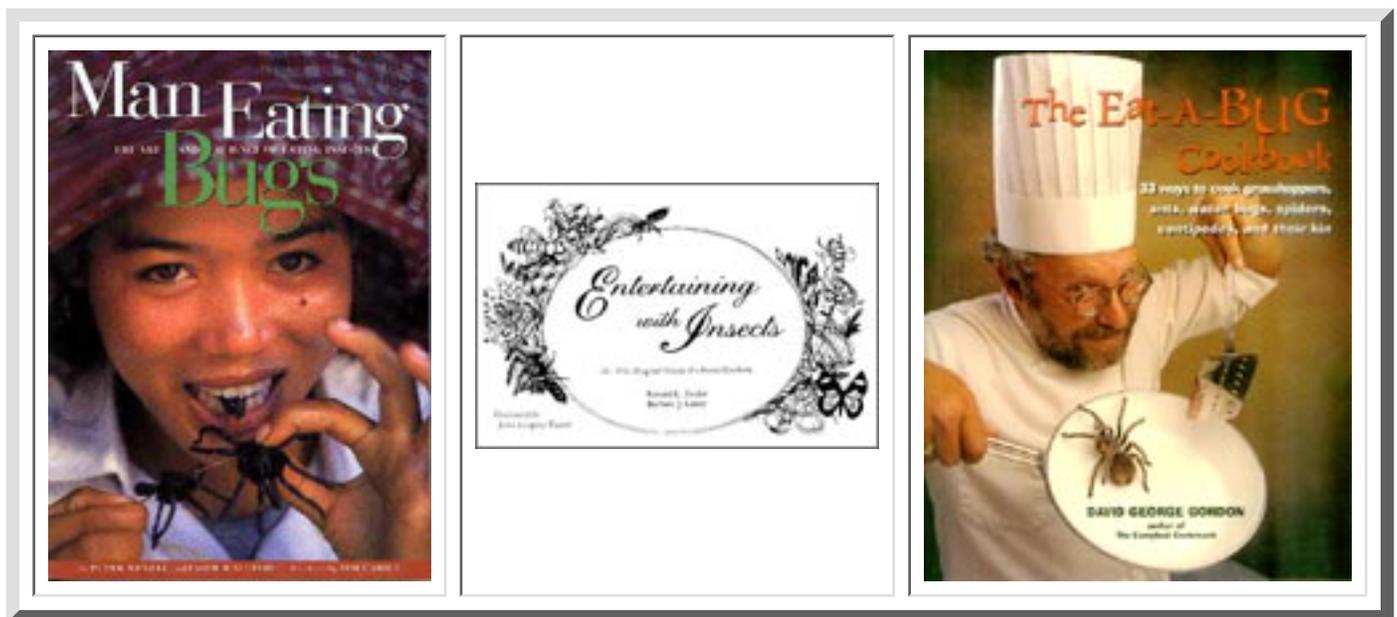
- Marge Knorr, a free-lance (primarily travel) writer from Reno, Nevada, had an article called "Food for Thought: Are Mormon crickets pests or protein?" in the May/June 1991 issue of Nevada magazine. At the end of the article, Ms. Knorr identifies herself as "a loyal subscriber to The Food Insects Newsletter," making her another favorite author. Inspiration for her article was the 1990 banner year for Mormon crickets in Nevada, but she describes interviews with a number of entomologists and anthropologists on a variety of edible insects. Diverse insights emerged. Catharine Fowler, an anthropology professor at the University of Nevada Reno, described pandora moth [*Coloradia pandora*] caterpillars as "very good - like a scrambled egg omelet with mushrooms." About 10 years ago, Fowler mediated a dispute between the Paiute Indians and the U.S. Forest Service in California as to whether the caterpillars (a traditional food of the Paiute) would be harvested or sprayed. This time the Paiute won. On the other hand, an assistant professor of nutrition at the UNR said, "I'd never eat insects. I'm too deeply immersed in my own culture."

- Finally, to be right up-to-date, there is an article called "Zaire River: Lifeline for a Nation," by Robert Caputo in the current issue (November 1991) of National Geographic.

It is accompanied by an interesting photograph (page 26) captioned: Caterpillars and palm grubs fresh off the riverboat cover a table in Kinshasa's central market.

- The pre-Hispanic insect foods of Mexico seem to get the lion's share of attention from the popular press in the United States. Don Chon's, in particular, has been featured or at least mentioned in several magazines and newspapers, lately, and by now it must be one of the best known restaurants in Mexico. Makes you wonder if some enterprising restaurateur in the U.S. might reap a million dollars' worth of publicity free by offering some of the grasshoppers, harvester ants, yellowjacket larvae/pupae, etc. that were such an important part of the food of our Indian forebears on this continent.

The foregoing is not by any means a complete inventory. There are no doubt many articles that we have not seen, and only one (of many) in which this editor has been involved as an interviewee is included. It would be hard to believe that the kind of media bombardment that has been occurring isn't increasing public awareness that edible insects are respectable players on the world stage. GRD



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)
[Home-Building Books | Green Goods for the Home](#)
[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

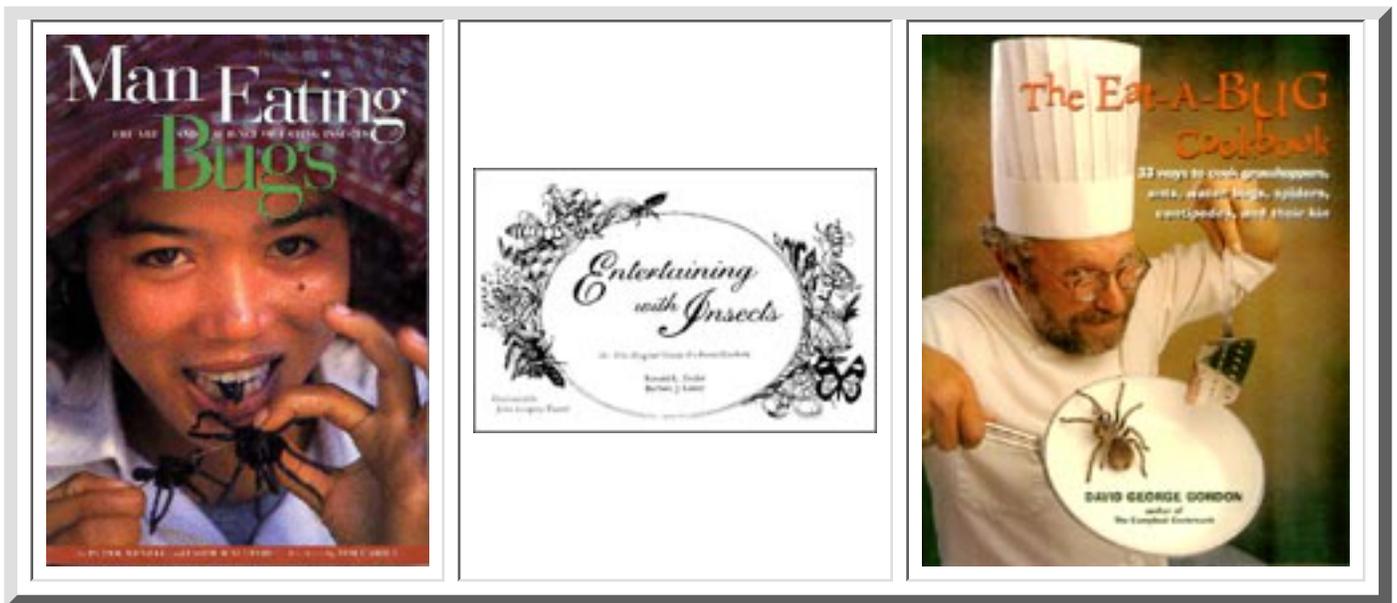
Collecting Ant Pupae for Food
November 1990. Volume 3, Issue #3.
By Gregg Henderson

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.



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

Hunter-gatherers were sometimes very labor-efficient

A Grasshopper in Every Pot

July 1989. Volume 2, Issue #2.

By David B. Madsen

originally published in Natural History (New York). July 1989. pp. 22-25.

In the spring of 1985, "millions" of grasshoppers (the migratory grasshopper, *Melanoplus sanguinipes*) were found lying along the eastern shore of the Great Salt Lake. Madsen, state archaeologist in the Antiquities Section of Utah's Division of State History, says, "enormous numbers of the insects had flown or been blown into the salt water and had subsequently been washed up, leaving neat rows of salted and sun-dried grasshoppers stretched for miles along the beach." The hoppers, coated with a thin veneer of sand, were in as many as five rows in some places, with the widest rows ranging up to more than six feet in width and nine inches thick and containing up to 10,000 grasshoppers per foot.

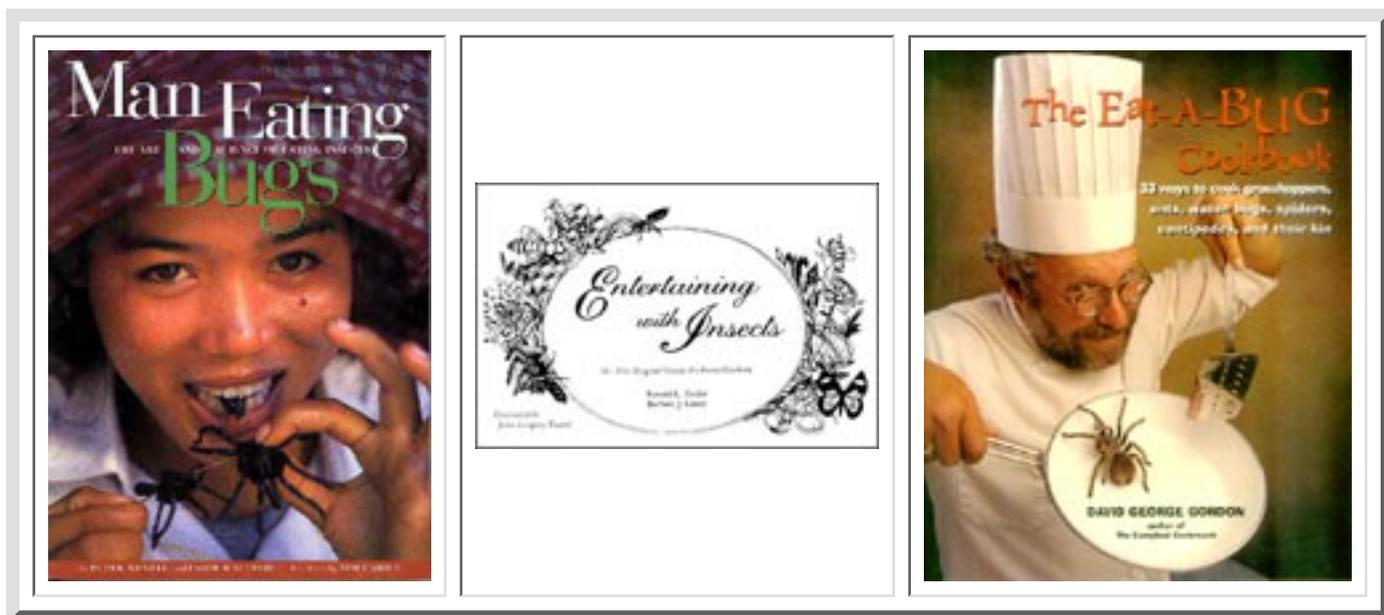
A year earlier, while digging in Lakeside Cave which is at the western edge of the Great Salt Lake, Madsen and co-workers had discovered thousands (and estimated millions) of grasshopper fragments in the various strata of the cave floor. The hopper fragments, in a matrix of sand, were also found in the majority of samples of dried human feces found in the cave. The connection between beach and cave was obvious. Lakeside Cave has been visited by Great Basin hunter-gatherers intermittently for the past 5,000 years. It served only as a temporary base because it is far from fresh water. Obviously, the cave was used as a winnowing site for removing sand from the grasshoppers which were scooped up at the beach and most of which were then hauled elsewhere.

Madsen and colleagues found that one person could collect an average of 200 pounds of the sun-dried grasshoppers per hour. At 1,365 calories per pound (compared with about 1,240 calories per pound of cooked medium-fat beef and about 1,590 calories per pound of wheat flour), this amounted to an average return of 273,000 calories per hour of effort invested. According to Madsen, "Even when we took a tenth of this figure, to be conservative, we found this to be the highest rate of return of any local resource. It is far higher than the 300 to 1,000 calories per hour rate produced by collecting most seeds (such as sunflower seeds and pine nuts) and higher even than the estimated 25,000 calories per hour for large game animals such as deer or antelope."

Madsen also investigated the rate of return per unit of effort expended in collecting Mormon crickets (*Anabrus simplex*), another food of early Native Americans. Crickets were collected from bushes, grass, etc., at rates of 600 to 1,452 per hour, an average of nearly two and one-third pounds or, at 1,270 calories per pound, an average of 2,959 calories per hour. The crickets often reach greatest densities along the margins of

streams or other bodies of water which lie in their line of march and which they will attempt to cross. In two such situations, they were collected at the rates of 5,652 and 9,876 per hour, an average of nearly 18 1/2 pounds of crickets or 23,479 calories per hour. The first number (2,959 calories per hour) surpasses the return rate from all local resources except small and large game animals, while the latter compares favorably even with deer and other large game.

Madsen places cricket collecting in a modern context by saying, "One person collecting crickets from the water margin for one hour, yielding eighteen and one-half pounds, therefore, accomplishes as much as one collecting 87 chili dogs, 49 slices of pizza, or 43 Big Macs." He concludes, "Our findings thus showed that the use of insects as a food resource made a great deal of economic sense."



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

How much is one good idea worth to you?

The Food Insects Newsletter is currently operating on borrowed funds.
Your donation is needed Now to print the next issue of the Food Insects Newsletter.

Thanks for your support!

A Query:

Are processed insect food products still commercially available in the United States?

November 1988. Volume 1, Issue #2.

By Gene R. DeFoliart
University of Wisconsin
Madison, WI

Marston Bates, the eminent zoologist, wrote in 1960 in *The American Scholar* (29:43-52): "In our household, I am left in complete command of one department - the things to eat with drinks. In the store where I do most of the buying, there is a wonderful assortment of temptations: fish eggs of many kinds other than the authentic but impossibly expensive caviar; fish themselves of many species, prepared in many ways; a wide variety of cheeses and sausages, of crispy fried things, of olives and nuts and minced clams and smoked oysters. Lately several kinds of insects have appeared on the shelves - canned ants and silkworm pupae from Japan, maguey worms from Mexico, fried grasshoppers - the can doesn't say where they are from. Insects are an important element in human diet in many parts of the world, but they have long been taboo in European civilizations. It is possible that they will get back into the Western diet by way of the cocktail hour."

Bates continued: "The maguey worms [larvae of the giant skipper butterfly, *Aegiale hesperiaris*] have been canned for the local market in Mexico for some time, and now they are being imported into the United States by the stores that specialize in fancy foods. The canned worms are best if eaten hot; they have a pleasant, nutty flavor, which blends as well with a martini as with mescal, the potent drink that the Mexicans distill from the fermented pulque. In my home we have been trying these worms on cocktail guests. As yet we haven't found anyone who disliked them, although our guests have shown considerable variation in the degree of their enthusiasm. The worms at least provide a topic of conversation."

In concluding this particular bit of discussion, Bates said, "From these experiments of ours with guests, I get the idea that while Americans may be prejudiced, they are far from being proud of their prejudices."

Lucy Clausen of Columbia University and the American Museum of Natural History, and author of *Insect Fact and Folklore* (1963), also mentioned maguey worms but by another name, saying that people in the United States are eating fried "gusanos" [=maguey worms] with relish. "Close to the Mexican border, 'gusanos' are served as thirst-producers at cocktail parties. In recent years Mexico has been canning and exporting 'gusanos' and they may now be purchased in the better delicatessen and department stores of our larger cities. They are advertised as 'delicious delicacies, especially with cocktails.'"

In 1960, Hocking and Matsumura, of the University of Alberta noted that a product canned in Japan under the name "Baby Bees" (fried bee pupae with soy sauce) had been available for some time on the Canadian market at a price of \$2.20 per 2 ounces (Bee World 41: 113- 120).

James Trager, in *The Food Book* (1972), after discussing several insects that are classed as delicacies in other countries, stated: "But the only insects in American supermarkets, at least the only kinds offered for sale [*italics added*], are fried grasshoppers, Japanese ants, bees and silkworm pupae, and Mexican maguey worms.... All are sold in cans, ostensibly as cocktail snacks but basically for their entertainment value. Americans' propensity for 'impulse purchases' is prodigious." Trager's book, by the way, was formerly titled, "The Enriched, Fortified, Concentrated, Country-fresh, Lip-smacking, Finger-licking, International, Unexpurgated Foodbook."

Finally, Ronald Taylor devoted 14 pages in his book, *Butterflies in My Stomach* (1975; pp. 83-96), to a description of 19 processed, mostly canned, insect foods available in the American marketplace. Most of these products (11 of them) were offered by Reese Finer Foods, Inc., who imported them from Japan. They were sold primarily as novelty items with highest sales around the New Year.

In view of the above, we were surprised to find a couple of years ago that imported insect products could not be found in specialty food shops here in Madison, Wisconsin. A number of long-time residents to whom we mentioned this were also surprised, saying that such products were formerly available. A more superficial search in Minneapolis-St. Paul was also unsuccessful. A letter to Reese, Inc., brought the information that they no longer import these products. We heard from a Chicagoan that, until recently at least, the Marshall Field Company catalog listed several insect food products, but the Madison store knew nothing about this.

I should say that our question results more from curiosity than from any sense of urgent need. Taylor (loc. cit.), an avowed advocate of the palatability of insects, states: "Personally, I find most canned insects unpleasant tasting - some worse than others - or, at the very least, insipid. If, however, you want to eat a canned insect, my suggestion is that you begin with the agave worm [yet another name for the maguey worm]." Taylor, the author (with Barbara Carter) of [Entertaining with Insects: The Original Guide to Insect Cookery](#) [to be reviewed in the next Newsletter] states, "It is unfortunate that there aren't better prepared insect foods on the American market, and at reasonable prices." Similarly, Bates (loc. cit.) mentions that, "The Japanese now export canned fried ants to this country, but these canned ants seem to be quite tasteless, lacking the crisp, toasted quality that I remember from my South American experience." Bates was referring to the winged sexual forms of the leaf-cutter ants (*Atta* spp.) which are sold in movie theaters in Colombia and serve the same function as popcorn.

Certainly, there is an abundance of testimonials expounding the palatability of various

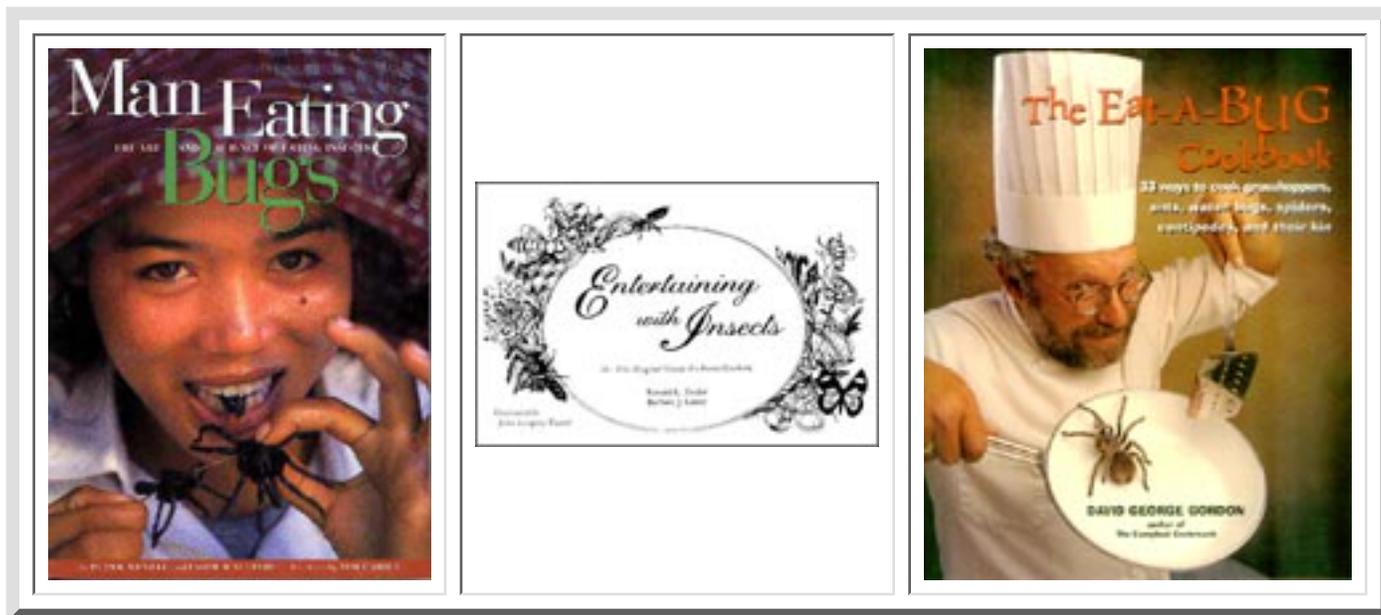
insects when properly prepared. I will mention only one here. Hocking and Matsumura (1960) subjected bee brood, prepared by shallow frying in butter or deep-fat frying in vegetable cooking fat, to an informal taste panel in Canada and reported: "Most reactions were favourable and some were eulogistic; initial prejudice proved easier to overcome than we had expected. When the tasters were asked to compare the material to some more familiar food, those most commonly mentioned were walnuts, pork crackling, sunflower seeds, and rice crispies." Joseph Alsop, in a Saturday Evening Post review of a Tokyo restaurant, mentioned that he very much enjoyed the appetizer of fried bees, the flavor being "halfway between pork crackling and wild honey."

The intent here is not to make or remake the case for promoting greater use of insects as food in the United States, Canada and Europe. Scores of respected western writers, both scientists and others, from the ancient Greeks onward have come down on the affirmative side of this question. Aristotle himself partook of cicadas and wrote (3rd century BC) that it is the last-instar nymph that "tastes best." One can partly agree and partly disagree with the statement by C. H. Curran in 1939 (*Natural History* 43:84-89): "During the past few years there have been a number of people who have suggested that we should eat insects. They are probably seeking notoriety or being facetious. Some of them have gone so far as to publish menus. There is no 'should' or 'should not' about the advisability of people eating insects. If they wish to do so there is no reason why they should not, since there are hundreds of different kinds that are perfectly edible. However, it is absurd to urge upon a people blessed with a super abundance of good, delectable food, the advantage of eating something which is likely to prove less agreeable to the palate than the things to which we are now accustomed."

Curran was not personally squeamish about eating insects, in fact, he liked to point out, and sometimes demonstrate, that we unknowingly eat many of them with our regular food. He was aware of the wide use of insects as food in cultures of non-European origin and was, presumably, personally willing to honor the preferences of their palates just as he wanted his own preferences honored. On the other hand, times change. With the earth's increasingly apparent vulnerability to ecological abuse, much of it committed in the name of agriculture, we can increasingly recognize the validity of predictions such as one by the late Professor Brian Hocking, "We have about 50 more years of steaks and then perhaps we'll have to explore other sources of animal protein" (quoted by Catherine Philip, *Amer. Bee Jour.* 100:444, 1960). Although there is indeed a feverish pitch of activity by food and agricultural scientists aimed at increasing the quantity and quality of food supplies, insects are as studiously ignored today as they were in Hocking's time. That should change - for more reasons than we have space to discuss here.

To recognize the preferences of different national palates, borrowing from Curran's line of thinking, we can note that the giant water-bug *Lethocerus indicus*, a favorite food throughout southeast Asia from eastern India and Burma to Vietnam and southern China is now imported and sold (as whole bugs, paste, or alcohol extract known as "Mangdana essence") in southeast Asian community foodshops in San Francisco, Oakland, and Berkeley (Pemberton, *Pan-Pac. Entomologist* 64:81-82, 1988). Such products from many lands might become an important new dimension in international trade if we Americans

can learn to recognize and appreciate insects as the food resource that they deserve to be. They might also serve to create a whole new class of alternative crops for our hard-pressed small farms, alternative crops that are completely compatible with the principles of sustain able agriculture. Secondary benefits of a more relaxed attitude by Americans might include a reduced zealously in the cosmetic use of pesticides on our food crops. But these are other stories. In the meantime, any information that this article may elicit on the present availability of commercial food insect products in the western world will be printed in the next issue of the Newsletter.



Check out these [Edible Insects Books](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

FOODANDLEISURE.COM - The Ultimate Web Resource

FEATURED RESOURCES

-  [Careers](#)
-  [Cars](#)
-  [Casinos](#)
-  [Credit Cards](#)
-  [Education](#)
-  [Health](#)
-  [Real Estate](#)
-  [Refinancing](#)
-  [Travel](#)
-  [Weight Loss](#)
-  [Web Hosting](#)

Finance	Health	Internet
<ul style="list-style-type: none"> • Bankruptcy • Checks • Consolidate Debt • Credit Cards • Credit Report • Insurance • Loans • Refinancing • Stocks 	<ul style="list-style-type: none"> • Allergies • Contact Lenses • Dental Insurance • Hair Loss • Health Insurance • Pharmacies • Quit Smoking • Vitamins • Weight Loss 	<ul style="list-style-type: none"> • Dedicated Servers • Domain Names • DSL • ECommerce • Internet Services • Merchant Account • Search Engines • Web Design • Web Hosting
Real Estate	Jobs	Leisure
<ul style="list-style-type: none"> • Apartments • Home Equity Loans • Home Insurance • Home Loans • Houses • Mortgages • Moving • Real Estate • Refinance 	<ul style="list-style-type: none"> • Careers • Colleges • Degrees • Education • MBA • Nursing • Online Education • Resume • Work at Home 	<ul style="list-style-type: none"> • Airlines • Costa Rica • Cruises • Dating • Engagement Rings • Hotels • Rental Cars • Travel • Wedding Invitations
Shopping	Business	Vehicles
<ul style="list-style-type: none"> • Computers • Cigarettes • Concert Tickets • Digital Cameras • Cookies • Diamonds • DVD • Flowers • Long Distance 	<ul style="list-style-type: none"> • Computers • Incorporating • Inkjet Cartridges • Merchant Accounts • Office Supplies • Packaging • Payroll • Printers • Projectors 	<ul style="list-style-type: none"> • Auto Insurance • Auto Leases • Auto Warranty • Cars • Car Loans • New Cars • Rental Cars • SUV • Trucks

Search By Subject			
Arts	Business	Computers	Health
Movies, Television, Music	Jobs, Industries, Investing	Internet, Software, Hardware	Fitness, Medicine, Alternative
Home	News	Recreation	Reference
Kids, Consumers, Recipes	Media, Newspapers, Weather	Travel, Food, Outdoors, Humor	Maps, Education, Libraries
Science	Shopping	Society	Sports
Biology, Psychology, Physics	Autos, Clothing, Gifts	People, Religion, Issues	Baseball, Soccer, Basketball



Food Insects Newsletter **Thomas J. Elpel's**
[Web World Portal](#)



[Granny's Country Store](#)
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#)
[Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#)
[Green Goods for the Home](#)
[Books & Gifts for Kids](#)

[HOPS Press, LLC](#)
Self-Service
Instant Wholesale Discounts

[Primitive Living Skills](#)
Hollowtop Outdoor Primitive School, LLC
Tom's Journals
Skills Articles
Directory of Schools

[Sustainable Living](#)
Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

[Wildflowers & Weeds](#)
Plant Identification & Edible Plants
Rangeland Ecology
Weed Control Alternatives

[Society of Primitive Technology](#)
Bulletin of Primitive Technology
On-line Articles
Subscription Information

[3Rivers Park](#)
A Place for People
Help us Secure the Rivers!

[What's New?](#)
See what's new on all our websites!

HOPS Press, LLC
website orders are processed by:

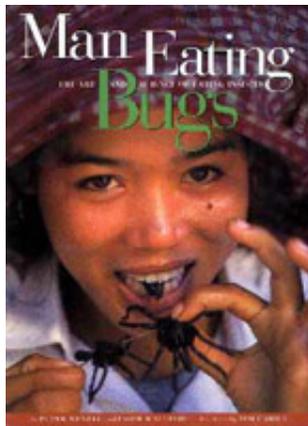
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684

Man Eating Bugs

The Art and Science of Eating Insects

by Peter Menzel & Faith D'Aluisio

Forward by Tim Cahill



The title *Man Eating Bugs* makes this book sound like a bad movie about over-grown, flesh-eating bugs. The reality, however, is that this is one first-class book documenting the primitive and contemporary traditions of eating insects all around the world.

The color plates featured on every page of this book are simply stunning. With crystal clarity, authors Peter Menzel and Faith D'Aluisio take the reader around the world to witness the bug-eating traditions in places like Peru, Venezuela, South Africa, Botswana, Uganda, Thailand, Cambodia, Indonesia, China, Australia, Japan, Mexico, and even the United States. The text of the book is a narration of the authors' experiences in their world-wide pursuit of entomophagy.

Man Eating Bugs is more like a "coffee table" book than a how-to manual. This text is a tool to alter perceptions and increase awareness about the idea of eating insects as food. Whether the book is intended for yourself, a friend, or a class of students, the reader will be fixated on the photography. You simply cannot open and close this book without broadening your horizons about the world we live in. 1998. 191 pages.

[Order from Amazon.com](#)

Creepy Crawly Cuisine

The Gourmet Guide to Edible Insects

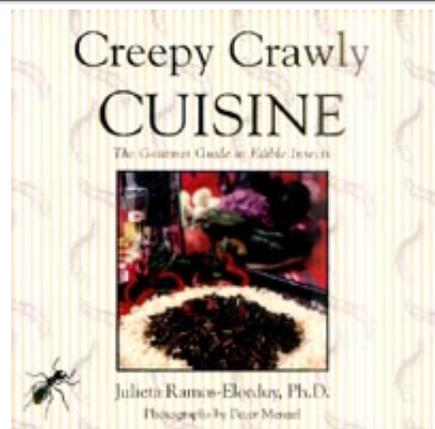
by Julieta Ramos-Elorduy, Ph.D.

with photography by Peter Menzel

The most wholesome source of protein on earth cannot be found in any supermarket in the United States, but it can be found right in your backyard! Insects have been a staple of almost every indigenous culture, not only because of their delicious flavor but also because they provide a more complete protein than soy, meat, or fish, and are concentrated sources of calcium, niacin, magnesium, potassium, the B-vitamins, and many other nutrients.

As the world heads for food shortages in the next century, insects can help meet humanity's growing nutritional needs. *Creepy Crawly Cuisine* tells you everything you need to know to make insects a part of your diet. It includes an overview of the use of edible insects by indigenous cultures, information on where to obtain insects and how to store and prepare them, and over 60 gourmet recipes, complete with stunning color photographs, that let you take the cooking of insects to dazzling culinary heights. As practical as it is unique, *Creepy Crawly Cuisine* is the ideal gift for followers of the *Diet for a Small Planet*, adventurous epicures, and cooks who think they have seen it all.. 1998. 150 pages.

[Order from Amazon.com](#)



The Eat-A-Bug Cookbook

33 ways to cook grasshoppers, ants, water bugs, spiders, centipedes, and their kin



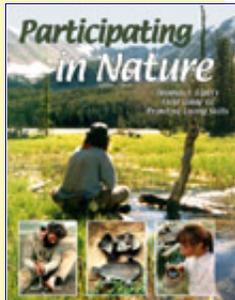
406-287-3605

[E-mail Contact Page](#)

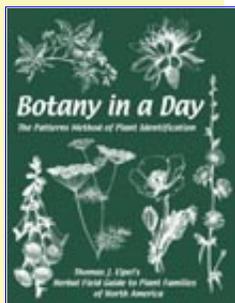


This Website Created on a lovable [Macintosh](#) computer!

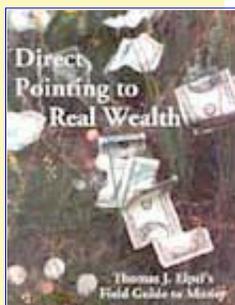
Books authored by **Thomas J. Elpel**



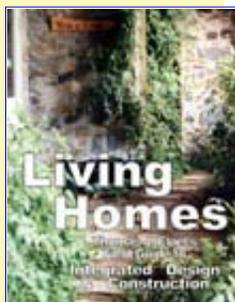
[Participating in Nature](#)



[Botany in a Day](#)



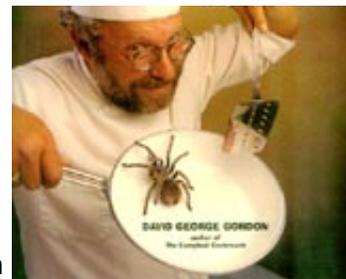
[Direct Pointing to Real Wealth](#)



[Living Homes](#)

by David George Gordon

The *Eat-A-Bug Cookbook* covers a wider range of edible bugs than *Entertaining with Insects* or *Creepy Crawly Cuisine*, including grasshoppers, crickets, ants, termites, cockroaches, water bugs, silkworms, hornworms, spiders, centipedes, dragonflies and moths.



The *Eat-A-Bug Cookbook* also includes current information about where to order all the bugs you could ever eat, plus fascinating trivia some tips on how to harvest your own. On the other hand, the book lacks some of the helpful tips about raising your own bugs, which are included in *Entertaining with Insects*. 1998. 101 pages.

[Order from Amazon.com](#)



Entertaining with Insects

by Ronald L. Taylor & Barbara J. Carter

How do you make lively conversation at a party? Serve insects! *Entertaining with Insects: The Original Guide To Insect Cookery* is the classic book of gourmet insect recipes for every occasion. But more than that, *Entertaining with*

Insects includes a directory of commercial sources for edible insects, plus directions on how to raise, clean, and prepare your own. Whether in the city or the country, you can farm your own and impress your friends with tasty treats of **mealworms, crickets, honey bees, wax moths, flour beetles, blow flies, and even earthworms!**

Entertaining with Insects was first published in 1976, but reprinted for the new world of the '90's. 160 pages.

[Order from Amazon.com](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

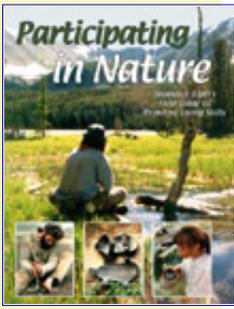
[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

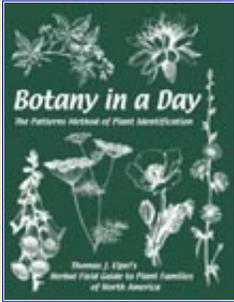
[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

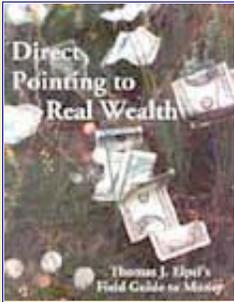
[Books & Gifts for Kids](#)



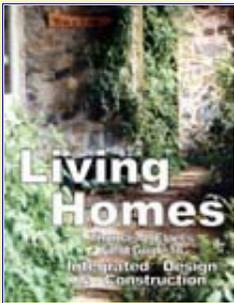
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



Food Insects Newsletter **Thomas J.**

Elpel's

[Web World Portal](#)



[Granny's Country Store](#)

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

[HOPS Press, LLC](#)

Self-Service
Instant Wholesale Discounts

[Primitive Living Skills](#)

**Hollowtop Outdoor
Primitive School, LLC**

Tom's Journals
Skills Articles
Directory of Schools

[Sustainable Living](#)

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

[Wildflowers & Weeds](#)

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

[Society of](#)

[Primitive Technology](#)

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

[3Rivers Park](#)

A Place for People
Help us Secure the Rivers!

[What's New?](#)

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

**Granny's
Country Store**

PO Box 684
Silver Star, MT 59751-0684

Other Food Insects Sites on the Web

[Society for Ethnoentomology](#)

[Cultural Entomology Digest](#)

[Zhiyong's Bug-Eating Page](#)

[Edible Insects-Good Stuff!](#)

[Another Food Insects Newsletter Site](#) [Audubon Institute-Eating Insects Nature Node-Insect Recipes](#) [Bugfood \(University of Kentucky\)](#)

[Insects as Food \(Iowa State University\)](#)

[Takumasa \(Demian\) Kondo's Entomophagy Page](#)

[Bug Bios--Pictures and Facts about Bugs](#)

[Edible Insects Books](#)

The book *Delicious Insects* is available in German, Italian and French. Insects are an abundant source of natural protein to feed the Earth's increasing population. This book is the world-reference on insect-eating (entomophagy). It has been presented by most of the major international TV and radio talk shows, and has initiated a worldwide renaissance of the entomophagic movement; with exciting insect-cooking recipes and details on how to raise edible insects at home and how to eat your first insect; © First edition: France, 1990: Jouvence; © Italian edition, 1992: Piemme; © German edition, 1993: Eichborn; foreword by Pr. Della Beffa. For ordering information please go to [The Comby Institute](#)

Other Interesting Insects Sites on the Web

[Insect Stings: The on-line resource for insect stings and allergies.](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)

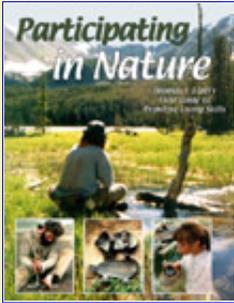
406-287-3605

[E-mail Contact Page](#)

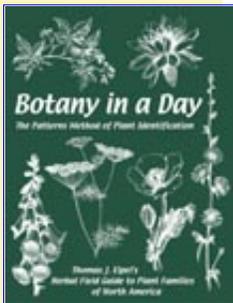


This Website Created on a lovable [Macintosh](#) computer!

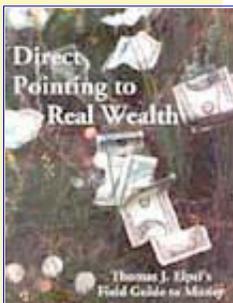
Books authored by
Thomas J. Elpel



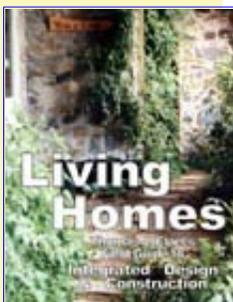
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



[Living Homes](#)

Redirecting you to the NEW page URL!

We've moved! This page will take you automatically to our new home page address. If it does not, click [HERE](#).

The SurvivalRing Homepage

Study Yesterday...Prepare Today...Live Tomorrow
Your resource for PERSONAL Survival, Preparedness, Civil Defense, Homeland Security and Self Reliance Information

MODERNSURVIVAL.NET

The Magazine of Freedom and Independent Thought

[Back](#) | [Forward](#) | [Refresh](#) | [Print](#) | [Bookmark Site!](#) | [Chat](#) | [Send To Friends](#) | [Printer Friendly](#) | [Email](#)

:: Buy Our NEW CDRom ::



- [Buy It Now!](#)
- [Why Buy It?](#)
- [See the Navigation](#)
- [Details of the CD](#)
- [Testimonials](#)
- [Corporate Sponsorship](#)
- [Support](#)
- [Future Releases](#)
- [For The Press...](#)

:: Stay Tuned In ::

Be notified
of page
updates

[it's private](#)

powered by
[ChangeDetection](#)

:: Coming Soon! ::

Added 10/03

Richard's Private Cache

I have a very limited supply of ORIGINAL FEMA, civil defense, and related documents that I have a FEW extra copies of. These are items that you can NOT find from the original sources anymore, and will definitely not be republished. This mini-store will be ONLY on this site, with current inventory, price, and shipping info. I'll accept Paypal as payment, and you can use Paypal, credit card, or electronic check for payment. Stay Tuned...some rare stuff is coming.

:: Your Help Needed...Support Richard in a New York Project, Win a Prize ::



Updated 2/20/04

For you folks out there that live and breath the outdoors every chance you get...here is a wonderful opportunity to bring the outdoors into your living room. This bronze statue is designed and forged at Eagle Bronze, based here in Lander, Wyoming. The work above is of the highest quality, from a world famous foundry, by famed artist Ben Foster.

This particular piece is valued at over \$1400.00. We are offering this item in a raffle, to raise funds for our Central Wyoming College (where I am a full time student) Business club to make a trip to New York as a college credit activity, and visit, among other things, the New York Stock Exchange, the site of the World Trade Center, the Statue of Liberty, and several other historically interesting locations while there. Go to my [New York Trip](#) page, where you can purchase raffle tickets directly from me, by using PAYPAL, and paying with a credit card, your Paypal account, or an electronic check. You can buy one ticket for \$5, six tickets for \$20, or as many as you want to increase your chances. You will be mailed your actual ticket within 24 hours of payment, via US Postal Mail.

This raffle is limited to 1000 tickets, so the more you buy, the better your chance to win. I personally have only *60* tickets to sell, and once they're gone, they're gone. The winner of the bronze will be chosen on March 5th, 2004, at 11 am, at our regular CWC Business Club Meeting, just a couple of weeks away, so BUY YOUR TICKETS NOW!!.

Of course, your supporting this raffle opportunity does more than give you a chance to win fine art. It allows our group to make a very educational trip and visit some of the most important places in US history. Personally, I would like to make this trip to see these places first hand, record the the trip with writings and images, and bring it back to ALL of you to share via my SurvivalRing website, as well as visit some of my best friends I've met through this website, such as Mark Foster and Barry Zell.

In other words, buying a ticket, or several, brings a great opportunity for all of us to share in the rich perspective that only personal visits to these places can give.

Again, for full details, and to immediately buy one or more tickets, visit [New York Trip](#) and read everything. Thanks so much for your support, and I hope to hear from you on this incredible opportunity.

Richard
richard@survivalring.org

:: An Overview of SurvivalRing - What We Are All About ::

:: Alerts and Status ::

NEW! - [SurvivalRing Weather Bunker - Helping you 'weather' the coming storms...](#)

[Weather Warnings](#)
[Homeland Security](#)
[Latest FBI Warning](#)
[Wyoming Road Conditions](#)
[Red Cross](#)
[Ready.Gov](#)
[Citizens Corp](#)
[Dept. Homeland Security](#)
[FEMA](#)

:: Site Updates ::

Updated 9/25/03

In March of this year, SurvivalRing was hacked and the entire site cleaned out. I am still in the process of restoring the CGI programs that were hit, including the BBS, downloads section and more. Bear with us...the downloads are on site, but some of the links are still tippy. We ARE fixing them as we speak. Thanks for your patience.

:: Richard's CURRENT Projects ::

Added 10/03

Besides this website, I also have many other online projects going on. Here are links to most of them

- (B)[SurvivalRing Home](#)
- (P)[My Weblog](#)
- (P)[SurvivalRing Weblog](#)
- (P)[Civil Defense Now](#)
- (B)[My WebDesign Site](#)
- (P)[New Personal Site](#)
- (S)[My Collegiate Club](#)
- (B)[My CD Roms](#)
- (B)[Wyoming Linen\(in work\)](#)
- (B)[Bus. Site](#)
- (P)[Blast Shelter new home](#)
- (B)[MyFalloutShelter.com](#)
- (P)[My Weather Site](#)
- (P)[My Genealogy](#)
- (S=School, B=Business, P=Personal)

Welcome To SurvivalRing - The BEST place in the world to start on YOUR road to preparedness. SurvivalRing started out in 1997 as a single web page, supporting the very first survival and preparedness oriented webbing. Over the next few years, it grew into a vast site, offering some of the hardest to find survival documents in the world...ORIGINAL civil defense documents, as created by the US and other governments.

It also turned into its very own portal system, linking to most of the oldest and best known preparedness, survival, and self reliance web sites on the web, through the webbing, direct links, and many other ways. Our email lists reach people all over the world, our downloads are completely free for all, our community services such as lists, clubs, chat, bbs, calendar and more are available to all, and more features are being added all the time...again, all at no cost to anyone.

Currently we offer over 600 megabytes of civil defense files for download, with gigabytes more being made available via cd rom (we only have 1000 megabytes available on our web server right now!).

Our goals with SurvivalRing, and our Civil Defense Now project, are to collect and digitize EVERY SINGLE original civil defense document we can get our hands on, and share them with you and anyone else concerned with what "The Bad Guys" can and might throw at us. What has threatened civilization and society in the past, can and does threaten us again...whether it's terrorism, nuclear threat, natural disaster, or anything else, you can and should know what might happen around here. In helping others prepare, we excel, and will continue sharing as we can through this site.

If you need help, ask. If you are looking for something in particular, ask. If you are new to the whole, entire concept of being prepared, spend a couple of weeks looking around here. You can't go wrong. Email me at Richard@survivalring.org. There is much inside our website, and it is here for you.

Please beware, though. Literally THOUSANDS of pages of classic documents, many pages of my own writing, maps, graphics, links, and more are inside. If pages take a moment to load, let them. If something is broken, the 404 page will tell you details, and you can email me. If a download is broken (there are hundreds of free files), tell me and I'll jump on getting it fixed as soon as possible.

Unlike a lot of web sites of this genre, SurvivalRing is a CONTENT oriented website. This means we PROVIDE the documents that other sites LINK to, COPY, or simply "re-sell". We produce original works here as well, and give them to you, for YOUR preparedness and personal awareness. We share because we care.

Richard Fleetwood
Founder - SurvivalRing, The Blast Shelter, MyFalloutShelter.com, and Civil Defense Now.
"Study Yesterday...Prepare Today...Live Tomorrow."

To our regular visitors! All is well, everything that has been on SurvivalRing IS STILL here. Our index page has been getting massive hits, but was just too darn big. More streamlining coming, AND more uploads. I have over 100 megabytes of NEW documents to add to the site, and have the broken downloads getting repaired. Thanks for your support!

This NEW site layout is the wave of our future. More pages to be converted shortly. Please bear with us as we get caught up in our conversion. Some links here WON'T work, but most will. Comments welcome on the NEW layout...PLEASE! Thanks,
[Richard](#)

[Enter The SurvivalRing Main Site](#)

find out more at survivalism.meetup.com

You are the

00404508

visitor to this page since May 1, 1997

02:40^{PM}

02-29-2004

ELEVATED

[Monitoring U.S. Homeland Security](#)

[SurvivalRing Top 100 Survival Sites](#)



"Study Yesterday...Prepare Today...Live Tomorrow."

Do it. Live it. Be it. Only YOU can do it for yourself. I, and my friends, will help where we can. After 9.11, you MUST take time to learn how and what to prepare for...save yourself, save your family...by taking that time NOW.

Richard Fleetwood - Founder - SurvivalRing

This site is a member of WebRing. To browse visit
<http://ss.webring.com/navbar?f=l&y=survivalring&u=99526102910426024>

SundancerDigiPros.com
Where Dreams Become Digital...

Site Design By -
www.sundancerdigipros.com

Born on: May 1, 1997

[SurvivalRing Homepage](#) [About Us](#) [Members](#) [Communicate](#) [Services](#)
[Civil Defense Now!](#) [Help](#) [Latest Newsletter](#) [Contact Us](#)

©1997 - 2004 [Richard A. Fleetwood](#). All rights reserved.,

-- [Use Statement](#) -- [Privacy Policy](#) -- [Disclaimer](#) -- [Thanks](#) --

Unauthorized use, reproduction, or reposting is strictly prohibited.

The phrase SurvivalRing, the various SurvivalRing graphics, and the associated SurvivalRing LOGOS on this website are all COPYRIGHT by Richard Fleetwood
©1997-2004

You've come down TOO far...go back up and visit the REST of the web site!!



SurvivalRing - The Original Survival and Preparedness Webring

[Join This Ring](#) - [Visit Forum](#)

 RingMaster: [survivalring](#) [RingMaster's site](#)
[Home](#) > [Computers & Internet](#) > [Cyberculture](#) > [Virtual Communities](#)

About this Ring



SurvivalRing is for those interested in learning more about planning, preparing, and executing plans of action in preparation for situations that affect life, limb, and liberty. Educating yourself on the threats that might affect you and your loved ones is the KEY to having a future to share with them. We study survivalism, self sufficiency, preparedness, and the past...to help prepare for the future. We focus on the GROUP, because as an individual with knowledge, we can help those who can't help themselves.

Permanent Posts

Recommended Firearms

What firearms would you recommend as a start to build on. I already have a

Welcome!

Use this forum to discuss the SurvivalRing webring, survival, or preparedne

[read...](#)

Featured Site(s)

[Frugal's Home Page for Survivalists and Patriots](#)

For Survivalists, Patriots, and Gunowners. Frugal's Forums, Frugal's Free Downloads, Frugal's Store, Survivalist Fiction, Extensive Survivalist Library.

[Modern Survival Magazine](#)

A new online magazine devoted to all aspects of survival

Sites in Ring - Navigation Rating: 98 [what's this?](#), Uniqueness Rating: 87 [what's this?](#)

[< Prev 8](#) | [Next 8 >](#)

[Institute for New Energy](#)

The INE researches and publishes information on advanced and new energy conversion theories, experiments, patents, papers, and reports. It is THE ORGANIZATION that is bridging the gap between traditional science and new advances reported in the energy conversion areas. A Huge Repository of data, with a Subject Index and Author Index, and a webpage summarizing Related Websites with link

[Pioneer Emergency Preparedness Products](#)

BayGen "Freeplay" and Luke Wind-Up AM/FM/Shortwave Radios. Wind-Up and solar-powered flashlights and lanterns. Solar power for radios and battery charging. Water filters and emergency 120-hour candles.

[End Times Revolution](#)

Survival of the Tribulation Saints/Christians Bearing Arms/Exposing Government Corruption

[Protect and Survive](#)

A site about UK civil defence plans containing civil defence literature from the 80s.

[The Internet Grocer](#)

The widest variety of quality dehydrated and freeze dried foods. Also delicious real canned meats and cheddar cheese. Grain mills, water filters, books and more. Discount pricing.

SurvivalRing - The Original Survival and Preparedness Webring Poll

Do you find the SurvivalRing useful in being prepared?

Only members who are logged in may register a vote. You are either not logged in or not a WebRing member. Use the Sign In link at top to log in or register for a WebRing User ID.

- It has helped me more than anything.
- I have used it as a starting point.
- It is interesting, and certainly needed.
- I have seen better elsewhere.
- Didn't help me a bit...

[view results without voting](#)

Ring Stats

- Created
- 175 active site(s)
- 39 page views today
- 140077 total page views
- [details](#)



[Dining on the Wilds wild edible plants](#)

Dining on the Wilds is a video course about wild edible plants.



[BlackOut Candles](#)

144 hour(6 day), non-toxic, clean burning candles for blackouts or other emergencies.



[Biological, Chemical, Nuclear terrorism survival.](#)

Terrorism from biological weapons, chemical weapons, and nuclear weapons. Our site provides free information on weapons of mass destruction from terrorist attacks.

[< Prev 8](#) | [Next 8 >](#)

Copyright © 2001-2004 WebRing, Inc. All rights reserved. [Terms of Service](#) - [Help](#)

Notice: We collect personal information on this site.

To learn more about how we use your information, see our [Privacy Policy](#)

WebRing server hosting provided by [SimpleNet](#).

WebRing Logo design by [Sean McCullough](#).

SURVIVALRING

JOIN THIS WEBRING



Member Sites	696
Queue Sites	31
Ringleaders	5
Email Lists	9

[ABOUT US]

[Home](#) | [What's NEW?](#)
| [What is SurvivalRing?](#) |
[Join SurvivalRing](#) |
[Supporting Us](#) | [F.A.Q.](#) |
[Navigation Info](#) | [Site](#)
[Map](#) | [Your Hosts](#) |
[Privacy](#) | [Topics](#) |
[Meetings](#)

[MEMBERS]

[Full List](#) | [Fast List](#) |
[Search](#) | [Statistics](#) |
[SurvivalRING of](#)
[HONOR](#) | [Community](#) |
[Site Management](#) |
[Advertising](#) | [RingWear](#)

[COMMUNICATE]

[Contact Us](#) | [Y2k Media](#)
[Help](#) | [Feedback](#) |
[SurvivalRing](#)
[Association](#) | [Sign](#)
[Guestbook](#) | [Read](#)
[Guestbook](#) | [Email Lists](#)

[NEWS]

[In The News](#) |
[SurvivalRing Newsletter](#)
| [ALERT List](#) | [Reviews](#)
| [Articles](#) | [Other Sources](#)
| [Your Thoughts](#) | [Press](#)
| [& Publicity](#) | [The](#)
[Survival WATCHDOG](#) |
[The BUGOUT Meter](#)

[HELP]

[Need Help Joining?](#) |
[Hints and Tips](#) |
[Volunteer Your Time?](#) |
[Translate](#)

Support SurvivalRing-Buy your Civil Defense related books and material from us!

How to Join SurvivalRing

Thanks for your interest in the **SurvivalRing**. We hope that together we can make a difference in helping ourselves, our loved ones, our neighbors, and everyone else we come into contact with, to make it thru the inevitable hard times ahead. If you wish to be a part of **SurvivalRing**, but do NOT have a website, you can join the **SurvivalRing** Listbot mailing list from ANY of the **SurvivalRing** pages, near the bottom of the page to stay up-to-date on the latest happenings with the webring. Also, consider becoming a part of the NEW **SurvivalRing Association**, a Yahoo Club, by clicking on the link in the MEMBERS section on this or any other ring page. The Association offers weekly chats, a calendar of events and news, message base, contact info, picture libraries, and more. It will be our base of operations for DAILY stuff if you want LIVE interaction with fellow preparedness folks.

How do I join the SurvivalRing Webring with MY website?

The submit form and further information on joining may be found on the next page. There is no cost involved and the only thing you have to do is add a bit of html code to your page. Before filling out the submission form, please read this page for important information.

What kind of website joins the SurvivalRing?

Each member of this **SurvivalRing** webring MUST have unique and thoughtful ideas, suggestions, and/or solutions to provide to any and all visitors to the ring, covering some aspect of Survival, Preparedness, or Y2k issues. Sites and pages should be ORIGINAL, cleancut, and prepared for ALL audiences. This webring is aimed at helping FAMILIES of ANY age to grow and learn together, and the Ringmaster respectfully requests that this be kept at the forefront of the potential **SurvivalRing** member's mind.

[Y2K]

[Y2k Thoughts](#) | [Y2k Scams](#) | [Y2k News](#)

[OTHER STUFF]

[Free Software](#) | [Graphics Gallery](#) | [Linking to us](#) | [The Book Bunker](#) | [Site Design/Info](#) | [Our Awards](#) | [Publishers](#)

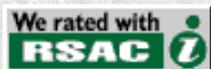
Be notified automatically when this page is updated
e-mail address:



Help Support Our Work here!



Books, videos, music, and much more!



Adult material, off-color remarks, racist or bigoted statements, and information for illegal, immoral, dangerous or deadly acts WILL NOT be tolerated here, on ring member sites, or in any email list, message base, or site submission connected with SurvivalRing. This standard WILL NOT be changed. Infractions WILL be dealt with immediately.

As mentioned above, the main purpose of this webring is TO EDUCATE AND UPLIFT all visitors. This can be done with stories about personal experiences, links to useful information, information of historical nature, and all commentary that provides personal insight to problems that we all face (hopefully with great suggestions or solutions on how to deal with those problems). Keep in mind that ANY site submitted MUST have topics that INCLUDE Survival, Preparedness, or Y2K issues. These areas do not have to be the main topic of your site, but they must play a major role. I lean heavily in favor of sites that really have original content that visitors can use and learn with. Also, commercial sites that offer tools, supplies, books, training, and the like are welcome here, as long as the products deal with some facet of preparedness and survival.

What exactly IS a Webring?

New to the idea of webring? For the FULL story, go to <http://www.webring.org>. For our purposes here, a webring brings an entirely NEW dimension to linking websites with a common theme together in an innovative, state of the art, and thoroughly updateable way so that fresh, useful and hopefully concise information can be found by visitors and used in educating themselves in any way that they see fit. The key word is EDUCATION in ***SurvivalRing***.....

Both personal and commercial sites are being accepted to the *SurvivalRing*** right now, as long as they meet the guidelines mentioned above.**

Important Information for Member sites and Ring Visitors

Please understand that I, your [Ringmaster](#), am the sole operator and contact point for this webring. I add, delete, and modify member site info as needed to maintain smooth operation of this webring. I fully intend to do this indefinitely as the ring grows and prospers.

I decide who joins the ring, and who doesn't fit into the ring. There are a few sites I have found out on the web that actually use my SurvivalRing LOGO, table html data, and even assume the site ID of sites actually authorized to be in the SurvivalRing webring. If a site happens to have the above HTML code with the two tornado photos/links, but does NOT appear in the [INDEX](#) of sites in the SurvivalRing, then that site is breaking copyright law.

Remember, there is NEVER any cost, obligation, or dues required to join this webring. This will never change. If you wish to be a part of the SurvivalRing, truthfully fill out the short form, have a site that fits into the above topics and categories, and add that little bit of html to your webpage. It doesn't get any easier, or harder, than that.



If you wish to join the **SurvivalRing**, please go to the '**Add Your Site**' page [here](#).



Join the **SurvivalRing** mailing list!
Enter your email address below,
then click the 'Join List' button:

[Powered by ListBot](#) | [View List Archive](#)



[\[ABOUT US\]](#) [Home](#) [What's NEW?](#) [What is SurvivalRing?](#) [Join SurvivalRing](#) [Supporting Us](#) [F.A.Q.](#) [Navigation Info](#) [Site Map](#) [Your Hosts](#) [Privacy](#) [Topics](#) [Meetings](#) [\[MEMBERS\]](#) [Full List](#) [Fast List](#) [Search](#) [Statistics](#) [SurvivalRING of HONOR](#) [Community](#) [Site Management](#) [Advertising](#) [RingWear](#) [\[COMMUNICATE\]](#) [Contact Us](#) [Y2k Media Help](#) [Feedback](#) [SurvivalRing Association](#) [Sign Guestbook](#) [Read Guestbook](#) [Email Lists](#) [\[NEWS\]](#) [In The News](#) [SurvivalRing Newsletter](#) [ALERT List](#) [Reviews](#) [Articles](#) [Other Sources](#) [Your Thoughts](#) [Press & Publicity](#) [The Survival WATCHDOG](#) [The BUGOUT Meter](#) [\[HELP\]](#) [Need Help Joining?](#) [Hints and Tips](#) [Volunteer Your Time?](#) [Translate \[Y2K\]](#) [Y2k Thoughts](#) [Y2k Scams](#) [Y2k News](#) [\[OTHER STUFF\]](#) [Free Software](#) [Graphics Gallery](#) [Linking to us](#) [The Book Bunker](#) [Site Design/Info](#) [Our Awards](#) [Publishers](#)



Site Design by

and

The phrase SurvivalRing, the various SurvivalRing graphics, and the associated SurvivalRing LOGOS on this website are all **COPYRIGHTED** by Richard Fleetwood ©1997-99, All Rights Reserved.

Unauthorized use, reproduction, or reposting is strictly prohibited.

Last Modified: August 24, 1999	URL: join.htm
Author: Richard Fleetwood	Email: rafleet@aol.com

Granny's COUNTRY STORE SILVER STAR, MT

PO Box 684
Silver Star, MT 59751
406-287-3605

Thomas J. Elpel's
Web World Portal



Granny's Country Store

- Tom's Books & Videos
- Primitive Wilderness Survival
- Nature, Wildlife & Tracking
- Plant Identification & Ecology
- Home-Building Books
- Green Goods for the Home
- Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor Primitive School, LLC

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:



Granny's
Country Store
www.GrannysStore.com

-Contact Information-

General Inquiries
flutesong@hollowtop.com

Customer Assistance

Granny's Country Store
PO Box 684
Silver Star, MT 59751
406-287-3605
orders@grannysstore.com

Hollowtop Outdoor
Primitive School, LLC
PO Box 697
Pony, MT 59747
406-685-3222
flutesong@hollowtop.com

HOPS Press, LLC
PO Box 697
Pony, MT 59747
406-685-3222
flutesong@hollowtop.com

3Rivers Park
PO Box 697
Pony, MT 59747
Vision2100@3riverspark.org

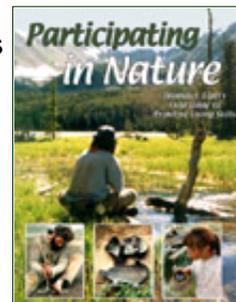
-These e-mail addresses are occasionally changed to evade spammers.-

Please Note: We receive a steady stream of e-mail questions from web surfers all over the world, on topics as varied as these:

- What woods work best in my area for starting a bowdrill fire?
- Is it better to insulate the inside or outside of my basement walls?
- What is this plant with pink flowers in my back yard?
- Are there any insects in the U.S. that are poisonous to eat?
- Can we build a log house with green wood?
- How can I go about starting my own wilderness survival school?

We also receive many e-mails and phone questions from newspaper and magazine reporters researching stories, as well as inquiries from a variety of television programs. We continue to do our best to respond to your questions to the best of our abilities. However, given the volume of letters we receive, we are not quite as timely as before in our responses!

Keep in mind that **computers, the internet, and people all make mistakes.** If we don't answer your e-mail, then there is a chance



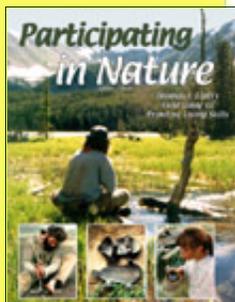
Granny's Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
orders@grannysstore.com

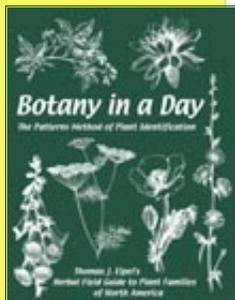


This Website Created on a lovable
Macintosh computer!

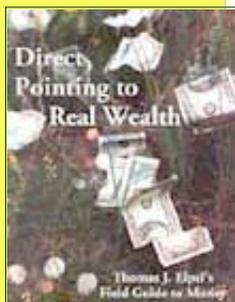
Books authored by
Thomas J. Elpel



[Participating in Nature](#)



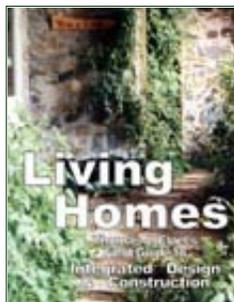
[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)

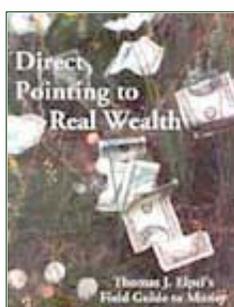
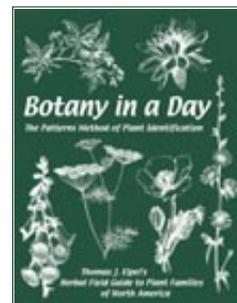
that it never arrived here. Also please make sure you are sending it with the correct e-mail return address, as we have spent a lot of time answering some questions, only to find that the e-mail addresses they came from were invalid. Any e-mails with attached viruses are deleted without being read or responded to.

Our responses are prioritized first to our **customers** with questions about orders, pricing, billing, or shipping. Expect to hear back from us within a day or two usually, unless we are away from the office. Of course, you can also call us at **406-287-3605** or write to us snail-mail at the address below.



We are slower at responding to how-to questions about **primitive skills, plant identification** or **home construction**, mostly because a single inquiry can take a few days to mull over the question, and an hour or more to answer it. But we will answer your question as long as we feel qualified to do so. At the very least we will try to steer you in the right direction. Expect an answer in 2-4 weeks on these type of questions, potentially longer during summer months.

We are slowly in the process of creating some question and answer pages on the website to avoid answering the same questions again and again. As a courtesy to us, please read Tom's books (shown here) before asking questions, so that we do not have to spend so much time on subjects that have already been covered in-depth. Any topic you still have questions about after reading Tom's books is definitely fair game, and we will bend over backwards to answer it thoroughly.



The questions we are most likely to delete without any reply at all are the ones about **edible insects**, such as "what types are poisonous?" or "what is the nutritional content of grasshoppers?". Although we are the web host for the **Food Insects Newsletter**, we really know next to nothing about the subject ourselves (we would like to learn more). Please contact The Food Insects Newsletter directly for any questions you have for them.

For questions to the **Society of Primitive Technology**, please use the contact information on their web page. Thanks!

Thanks to Cindy for providing the link to the e-mail encoder. It translates e-mail addresses into numerical code to insert into the html to help trip up robots that are seeking e-mail addresses to send spam to.

Granny's
COUNTRY STORE
SILVER STAR, MT

How to Place Retail Orders

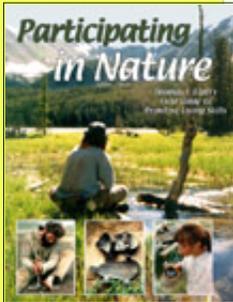
Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money

orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

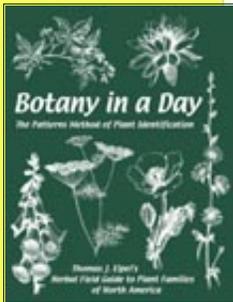
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
orders@grannysstore.com



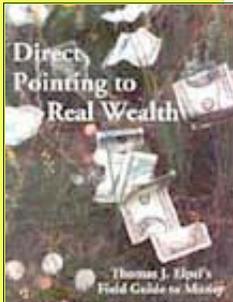
[Living Homes](#)



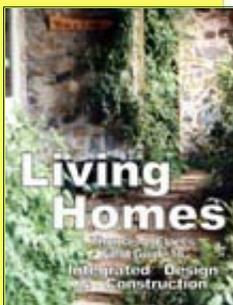
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



iPod mini

The world's smallest 1,000 song digital music player. For Mac and Windows.

Available in stores now.

Hot News Headlines

Over 100,000 Pre-orders for iPod mini, Available in Stores February 20.

**Apple Store
San Francisco**
Now open



**100 million
free songs.**



Introducing iLife '04



It's like
Microsoft
Office for
the rest of
your life.

Xserve G5

1U, 64-bit, G5 Processor
Single or Dual 2.0GHz



[iBook Logic Board Repair Extension Program](#)

[Site Map](#) | [Search Tips](#)

Visit the Apple Store [online](#) or at [retail](#) locations.
1-800-MY-APPLE

Find [Job Opportunities](#) at Apple.

Visit other Apple sites around the world:

[Contact Us](#) | [Terms of Use](#) | [Privacy Policy](#)

Powered by Mac OS X Server



HOPS Press, LLC

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos

Primitive Wilderness Survival

Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books

Green Goods for the Home

Books & Gifts for Kids

HOPS Press, LLC

Self-Service

Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor
Primitive School, LLC

Tom's Journals

Skills Articles

Directory of Schools

Sustainable Living

Alternative Construction

House-Building Classes

Articles & Resources

Ecological Economics

Wildflowers & Weeds

Plant Identification

& Edible Plants

Rangeland Ecology

Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive

Technology

On-line Articles

Subscription Information

3Rivers Park

A Place for People

Help us Secure the Rivers!

What's New?

See what's new

on all our websites!

HOPS Press, LLC

website orders

are processed by:

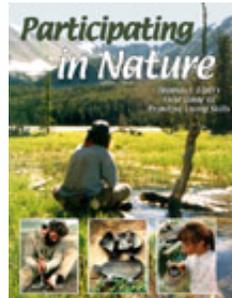
Granny's

-Participating in Nature-

Thomas J. Elpel's Field Guide to Primitive Living Skills

(5th Edition)

Get in touch with your wild side! Primitive living is a way of learning about nature by participating in it. Instead of merely camping in the wilderness or passing through it, you can become part of the process. You learn about nature by using it to meet your needs for shelter, fire, water, and food. You set aside the trappings of modern culture and step directly into nature with little or nothing, to experience nature on its own terms.



Tom's guide gives you a direct, hands-on experience of the world around you. With this book you have the opportunity to discover the thrill of staying warm and comfortable without even a blanket! Experience the magic of starting a fire by friction. Butcher your own deer and braintan its hide to make warm buckskin clothing. Learn about edible plants of the Rocky Mountain region, plus processing techniques and "primitive gourmet" skills like making wild strawberry ashcake pies or stir-fry cooking without a pan.

This book is the source for in depth coverage of tire sandals, bedroll packs and pack frames, felting with wool, quick bows and bone arrowheads, sinews, hide glue, trapping, fishing by hand, water purification, birch bark canisters, willow baskets, primitive pottery, wooden containers, cordage, twig deer, stalking skills, simple stone knives, flint & steel, bowdrill and handdrill fire-starting.

Participating in Nature includes dozens of innovative skills and an incredible 350 pictures and illustrations plus a thoughtful philosophy. Tom does extensive experiential research. He places an emphasis on publishing new information that is not found in any other source. **5th Edition. 198 pages. November 2002. \$25.**

-Environmental Note-

This book is printed on **100% post-consumer recycled paper**, bleached without chlorine.

Everything but the cover was printed with soy based inks.

\$1.00 from every copy sold is donated to 3Rivers Park to help purchase habitat for people and wildlife in the Missouri Headwaters watershed in southwest Montana.

-Please Scroll Down for our On-Line Ordering Form-

-Table of Contents-

SUNRISE: Earthskin | The Pony Millsite | Our Place in the World | Participating in Nature | The Cost of Gold | Finding Home and Making a Stand.

MIND: Nature as Wallpaper | Discoidal Stone Knives | Saving the World | Adapting to Change | Twined Baskets | The Human Brain: Evolving Neural Networks | Primitive Living as Metaphor | Personas and Acting | The Information Age | Split-Willow Figures | Perceptions of Reality.

SHELTER: Goals | The Elements of Shelter: Shingling | Efficiency | Insulation | Adapting Shelters to the Environment | Fire | Recouping Your Investment | Air-Proofing | The Earth Lodge | Impacts & Reclamation | Choosing a Location.

FIRE: Bowdrill Fire-Starting | Bowdrill Technique | Starting Bowdrill Fires with Damp Materials | Survival Bowdrills: Fire from Nothing | Handdrill Fire-Starting | Handdrill

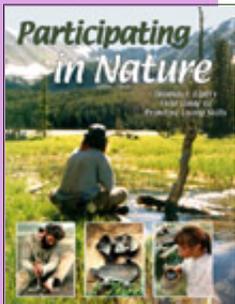
Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

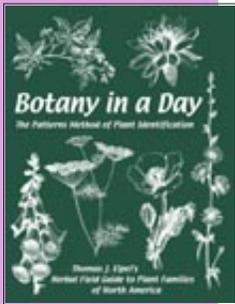


This Website Created on a lovable
Macintosh computer!

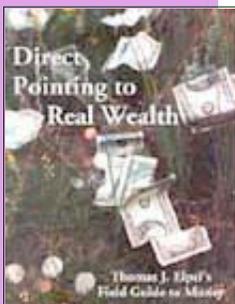
Books authored by
Thomas J. Epel



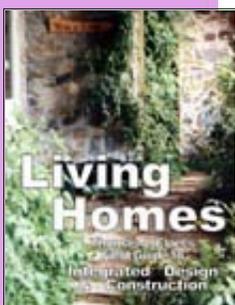
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



Technique | Other Friction Fire-Making Methods | Flint & Steel Fire-Starting | Principles of Fire-Starting | Campfire Logistics and Safety | Splitting Matches | Energy Conservation.

WATER: Birch Bark Canisters | Giardia & Water Purification | Water Conservation | Crapping in the Woods | Fishing by Hand | Making Cordage from Natural Fibers | Twisting Fibers into Cordage | Primitive Fishing Tackle | Skinny Dipping.

COOKING: Tin Cans/Stainless Steel Cans | Cooking without a Pan | Coal-Burned Containers | Making Hollow-Log Drums | Cooking in a Gold Pan | Stir-Fry without a Pan | Ashcakes: Bread of the Modern Abo | Bamboo Spoon/Fork & Chopsticks | Stone Ovens & Steam Pits | Complete Proteins | Primitive Pottery: Harvesting Wild Clay | Adding Temper | Wedging the Clay | Making Pinch Pots | Making Coil Pots | Drying Pottery | Firing Time | Cooking in Clay Pots | Beliefs about Food | Mice and the Hantavirus.

PLANTS: Identification Strategies | Common and Latin Names | The Digging Stick | Wild Food Economics | Wild Gardening | Natural Farming | The Ethics of Killing | Worthwhile Plant Food Resources | Edible Lichens | Syrup | Starchy Roots | Fruits | Seeds | Nuts | Mushrooms

ANIMALS: Sneak Stalking & Trust Stalking | Animals & Ecosystem Processes | Desertification and Holistic Management | The Quickie Bow | Flintknapping Thoughts | Bone Arrowheads | Making Arrows | All about Hide Glue | Sinew Preparation | Wildlife Laws | Butchering a Road Kill Deer | Gutting Deer | Skinning Your Deer | Butchering Basics | Hunting Notes | Deadfall Traps

CLOTHING: Braintan Overview | Braintanned Buckskin | Smoking the Hide | Sewing Buckskin | Shoes, Moccasins & Sandals | Tire Sandals | Wool & Blanket Ponchos | Felting with Wool

SUNSET : Canvas Sack Backpack | The Bedroll Pack | Pack Frames | Nicholson Mine | Goals in Primitive Living | The Equipment Checklist

AFTERWORD: THE ART OF NOTHING

BIBLIOGRAPHY

INDEX

See what the press is saying about [Participating in Nature!](#)

-Please scroll down the page for ordering information.-

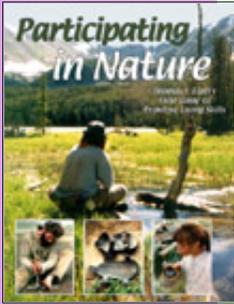
"I've read MANY books on survival. Enough that I rarely find fresh ideas in a new one I read. But yours is full of things that I haven't read in many other books. Thanks not only for the fresh ideas, but also for the fresh format. The narrative is wonderfully inspirational. I almost feel like I'm out in the field with you. I don't know if we'll ever meet (I hope we do), but if not I feel like I know you through your writings."

--David W.
Attala, Alabama

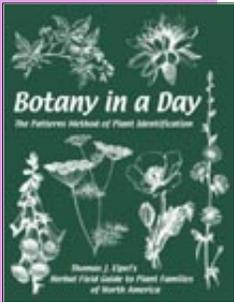
"I have your [Participating in Nature](#) book and read about the syrup. I have a big weeping birch in my yard and put 2 half inch taps in it last week and the last few days I have been getting 5 gallons of sap a day! I boiled 5 gallons of sap down to 1/2 pint of some of the best syrup I have ever tasted! I just wanted to say thanks for writing such a great book!"

-- Rob Simonich
[Simonich Knives](#)

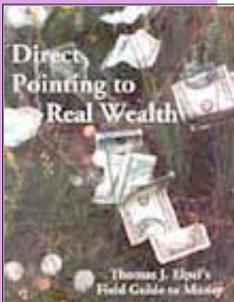
Living Homes



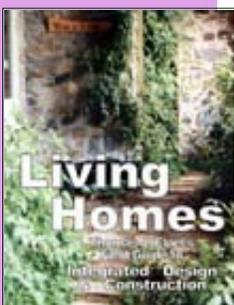
Participating in Nature



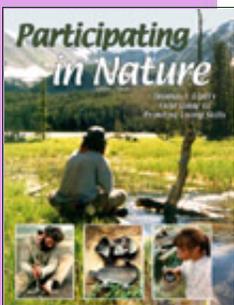
Botany in a Day



Direct Pointing to Real Wealth



Living Homes



Participating in Nature

Participating in Nature, 5th Edition. \$25.00 Quantity:

-Discount-

-Order both *Participating in Nature* and *Botany in a Day* and save \$5.00.-
-Order all four of Tom's books and save \$20.00.-

Botany in a Day + Participating in Nature \$45.00 Quantity:

Living Homes + Direct Pointing to Real Wealth + Participating in Nature + Botany in a Day \$75.00 Quantity:

Upgrades: If you own any previous edition of *Participating in Nature*, then you can tear out the **bibliography page** and mail it in to "upgrade" to the new edition for just \$10 + postage. Please mail the coupon and check or credit card info to our address below.

Unique Books & Videos by Thomas J. Elpel

Participating in Nature: *Thomas J. Elpel's Field Guide to Primitive Living Skills*

Botany in a Day: *The Patterns Method of Plant Identification*

Direct Pointing to Real Wealth: *Thomas J. Elpel's Field Guide to Money*

Living Homes: *Thomas J. Elpel's Field Guide to Integrated Design & Construction*

The Art of Slipform Stone Masonry *Video Companion to Living Homes*

The Art of Nothing Wilderness Survival Video Series

(Recorded on quality recycled VHS video tapes.)

3 Days at the River *with nothing but our bare hands.*

Mountain Meadows *camping with almost nothing but the dog.*

Mountain Lakes *a survival fishing trip.*

Return to **Books & Videos by Thomas J. Elpel.**

Return to the **HOPS Press, LLC Home Page.**



How to Place Retail Orders

(Click here for Wholesale Orders.)

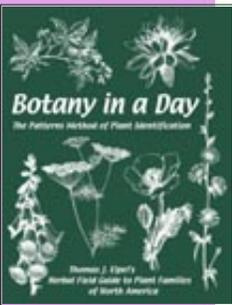
Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

**Granny's Country Store
PO Box 684**

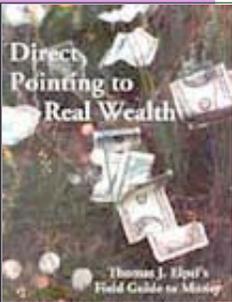
Silver Star, MT 59751-0684

406-287-3605

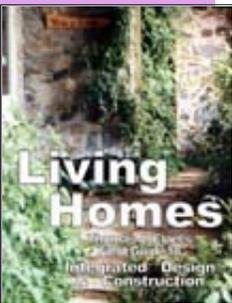
E-mail Contact Page



Botany in a Day



Direct Pointing
to Real Wealth



Living Homes

Thomas J. Elpel's Web World Portal

Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC

Primitive Living Skills | Sustainable Living | Wildflowers & Weeds

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids



HOPS Press, LLC

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

Hollowtop Outdoor
Primitive School, LLC

Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

Granny's

-Botany In A Day-

The Patterns Method of Plant Identification

Thomas J. Elpel's Herbal Field Guide to Plant Families

(5th Edition, January 2004)

Botany in a Day is changing the way people learn about plants! Tom's book has gained a nationwide audience almost exclusively by word-of-mouth. It is now used as a text and recommended by herbal and wilderness schools across North America. Instead of presenting individual plants, Botany in a Day unveils the patterns of identification and uses among related plants, giving readers simple tools to rapidly unlock the mysteries of the new species they encounter throughout the continent.

Too often people try to learn plants one-at-a-time, without rhyme or reason. Now you can cut years off the process of learning about plants and their uses. Tom's book helps you beyond the piece-meal approach to botany and herbalism towards a more "whole" approach. Within 1 1/2 hours you can understand the big-picture of botany and herbalism. Learn how related plants have similar features for identification. Discover how they often have similar properties and similar uses.

Tom's book takes you beyond the details towards a greater understanding of the patterns among plants. By mid-morning you can be in the field, matching flowers to the patterns in the book. Instead of learning plants one-at-a-time you will discover that you can learn them by the dozens--just by looking for patterns.

Most plant books cover only one or two hundred species. *Botany in a Day* includes more than 100 plant families and over 700 genera--applicable to many thousands of species.

By the end of the day you will have a functional knowledge of botany. You will be able to continue growing your knowledge of plants and plant patterns--in the wild, in your garden, among house plants, even at the florist. Understand the magic of patterns among plants, and the world will never look the same again!

All of the interior pages of *Botany in a Day* were printed with soy inks on 100% recycled paper. \$1.00 from every copy sold is donated to 3Rivers Park to help purchase habitat for people and wildlife in the Missouri Headwaters watershed in southwest Montana.

5th Edition, January 2004. 221 pages. The new edition includes an expanded tutorial section, a few additional families of plants, plus Tom worked over every illustration in the book... and finally had it proof-read. (It was about time!) *Botany in a Day* includes four indexes. **Cost: \$25.00.**

"Botany in a Day truly has the potential to become one of the most useful botany and herbal primers ever written."

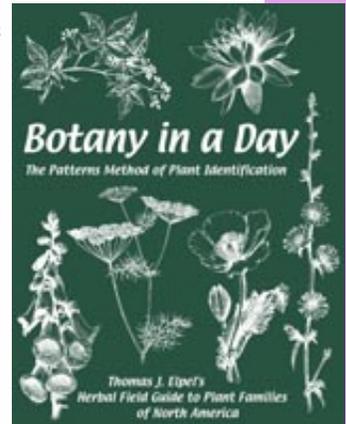
--Peter Gail, Ph.D.

Goosefoot Acres Center for Resourceful Living

PO Box 18016

Cleveland, OH 44118

"Botany in a Day has my highest recommendation for anyone--beginner or expert--interested in plants. Herbalists, naturalists, gardeners, and especially those involved



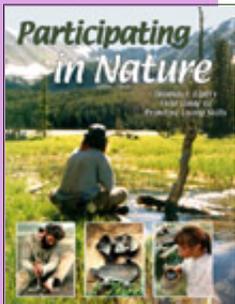
Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

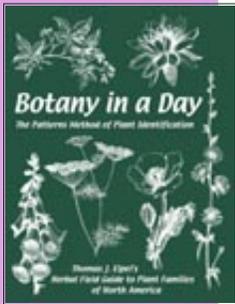


This Website Created on a lovable
Macintosh computer!

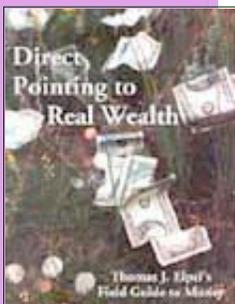
Books authored by
Thomas J. Elpel



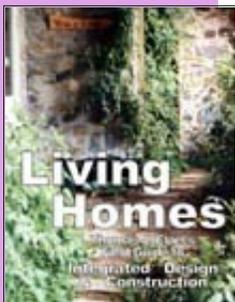
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



in teaching outdoor and survival skills will wonder how they ever managed without this superb book."

--Susun S. Weed, Director
Wise Woman Center
PO Box 64
Woodstock, NY 12498

"Botany in a Day is exactly what I needed for my botany classes. It goes beyond what is available in the standard field key, providing a wealth of information on individual families. Now my students are able to key local flora confidently, knowing they have reached the correct family by referring to Botany in a Day's detailed descriptions and pictures. They can become truly acquainted with the family's characteristics, constituents, medicinal uses, and patterns. I personally love all the stories about the edible plants, which describe in delicious detail how long it takes to collect and prepare each one."

--Garima Fairfax
Rocky Mountain Center for Botanical Studies
Boulder, Colorado

Botany in a Day \$25.00

Quantity:

-Discount-

-Order both *Participating in Nature* and *Botany in a Day* and save \$5.00.-
-Order all four of Tom's books and save \$20.00.-

Botany in a Day + Participating in Nature \$45.00

Quantity:

Living Homes + Direct Pointing to Real Wealth + Participating in Nature + Botany in a Day \$75.00

Quantity:

Upgrades: If you own any previous edition of *Botany in a Day*, then you can tear out the **bibliography page** and mail it in to "upgrade" to the new edition for just \$10 + postage. Please mail the coupon and check or credit card info to our address below.

Unique Books & Videos by Thomas J. Elpel

Participating in Nature: *Thomas J. Elpel's Field Guide to Primitive Living Skills*

Botany in a Day: *The Patterns Method of Plant Identification*

Direct Pointing to Real Wealth: *Thomas J. Elpel's Field Guide to Money*

Living Homes: *Thomas J. Elpel's Field Guide to Integrated Design & Construction*

The Art of Slipform Stone Masonry *Video Companion to Living Homes*

The Art of Nothing Wilderness Survival Video Series

(Recorded on quality recycled VHS video tapes.)

3 Days at the River *with nothing but our bare hands.*

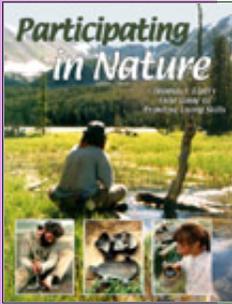
Mountain Meadows *camping with almost nothing but the dog.*

Mountain Lakes *a survival fishing trip.*

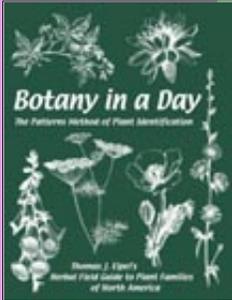
[Return to **Books & Videos** by Thomas J. Elpel.](#)

[Return to the **HOPS Press, LLC Home Page.**](#)

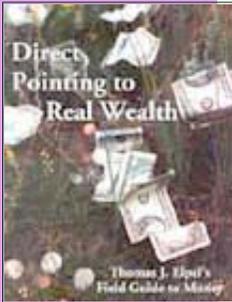
[Living Homes](#)



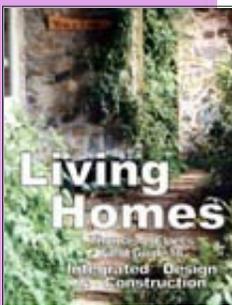
[Participating in Nature](#)



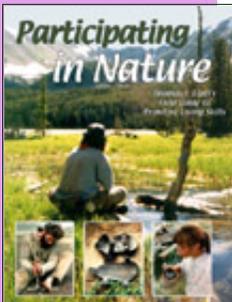
[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



How to Place Retail Orders

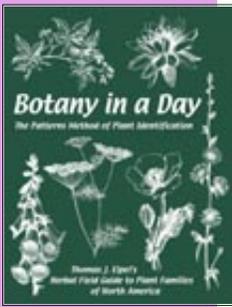
[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

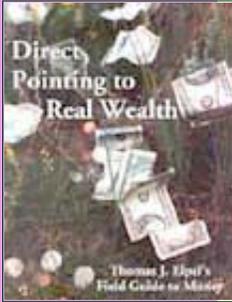
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

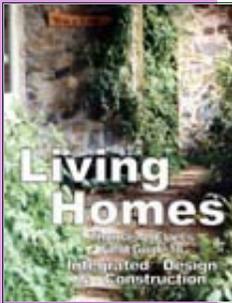
Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



HOPS Press, LLC

Thomas J. Elpel's
Web World Portal



Granny's Country Store

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

- Tom's Journals
- Skills Articles
- Directory of Schools

Sustainable Living

- Alternative Construction
- House-Building Classes
- Articles & Resources
- Ecological Economics

Wildflowers & Weeds

- Plant Identification
& Edible Plants
- Rangeland Ecology
- Weed Control Alternatives

Society of

Primitive Technology

- Bulletin of Primitive
Technology
- On-line Articles
- Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

Granny's

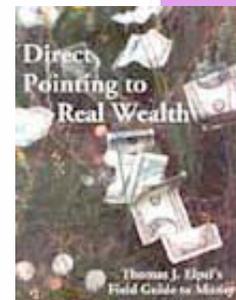
-Direct Pointing to Real Wealth-

Thomas J. Elpel's Field Guide to Money
(5th Edition)

All living organisms consume energy, modify resources from the environment and produce waste. That is an inescapable fact of life. But in nature all material wastes are recycled as inputs to other living organisms. The only true waste is diffuse, low-grade heat.

In order to create a truly sustainable economy we must mimic the ecosystem so that the waste of every household and business becomes resource inputs to other enterprises, and the only waste produced is diffuse, low-grade heat from renewable resources like solar.

In *Direct Pointing to Real Wealth* Thomas J. Elpel demonstrates that it is inevitable that we will create an ecologically sustainable economy. Tom turns conventional thinking on its head and out-lines steps you can take to increase your prosperity right now while closing the loop on waste and speeding the transition to a greener world.



Direct Pointing to Real Wealth is an enlightened look at the nature of money. Discover how the economy is like an ecosystem and how money is a token we use to represent calories of energy in the ecosystem. Tom's unique approach to money takes you beyond the numbers game to a direct examination of the laws of physics, biology, and economics. These laws are the same today as in the Stone Age, when people worked only a few hours per day and had much more leisure time than we do now.

Whether you are raising a family or running a business, Tom's book gives you a fresh new look at economics, ecology and how to achieve your Dreams. Break through perceived limitations to discover a world of prosperity and abundance! 5th Edition. May 2000. 182 Pages. **Cost: \$20.**

Direct Pointing to Real Wealth Table of Contents

Forward: Gardening the Ecosystem: The Do-Nothing Method of Real Wealth
Introduction: The Economy as an Ecosystem: Spontaneous Organization

Part I: The Nature of Wealth

- 1-1. Real Wealth: Taking Stock of our Capital
- 1-2. Calories: The Currency of All Economies
- 1-3. Inflation: The Changing Relationship Between Calories and Money
- 1-4. Prices and the Natural Ecosystem: Understanding Caloric Relationships
- 1-5. Wealth and Work: A Ten Thousand Year-Old Pattern

Part II: Principles of Economic Ecology

- 2-1. Matter & Energy: Industrial Metabolism and the Laws of Thermodynamics
- 2-2. Substitutes for Everything: The Good and Bad of Expanding the Resource Pie
- 2-3. The Human Equation: The Evolution of Consciousness
- 2-5. Succession: Making Change in the Ecosystem

Part III: Tools To Work With

- 3-1. Creativity: Eliminating the Obstacles to Your Dreams
- 3-2. Materials to Work With: Open Niches in the Economic Ecosystem
- 3-3. Technology: Putting Calories to Work
- 3-4. Energy: Squeezing Useful Work from Every Calorie

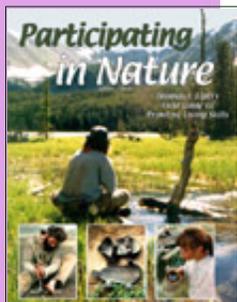
Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

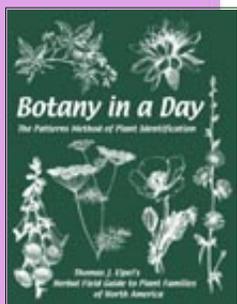


This Website Created on a lovable
Macintosh computer!

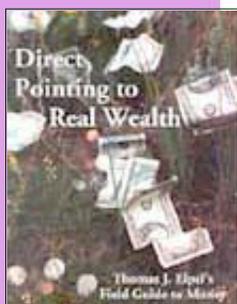
Books authored by
Thomas J. Elpel



[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



- 3-5. Money: Financial Ladders & Cultural Relativity
- 3-6. Labor: Adding Caloric Value
- 3-7. Credit: Calories to Start On

Part IV: Turning Dreams into Reality

- 4-1. The Sum of the Criteria: Creating Your Personal Vision
- 4-2. The Test of Time: Planning for All the Today's to Come

Part V: Putting Your Ideas to the Test

- 5-1. The Weakest Link: Success One Task at a Time
- 5-2. Cause & Effect: Finding Solutions Beyond the Symptoms
- 5-3. Marginal Reaction: Comparing Your Options
- 5-4. Energy/Wealth Source & Use Looking Out for our Children's Grandchildren
- 5-5. Neighbors & Culture: Respecting Others Along the Path to Your Dreams

Part VI: Implementing Your Strategy for Success

- 6-1. Planning: Prioritizing Your Action List
- 6-2. Learning & Growth: Empowering Yourself and Others Around You
- 6-3. Financial Planning: Managing Your Money
- 6-4. The Management Cycle: Monitoring & Flexibility

Part VII: Tilting Succession in the Ecosystem

- 7-1. Economic Stability: A Game of Musical Chairs
- 7-2. Taxation: A Tool For Change
- 7-3. Cleaning up Corporacy: Tilting Markets Towards a Better World

"You have been a tremendous inspiration to us. Your books, Money and Primitive Skills positively took ideas that had been running around in my head for years and tied them together for the foundation of my thinking. Without your books and ideas, I would still be trying to fit all my ideas and philosophies into one big picture. You've helped me get all those thoughts into goals, realistic goals, and I thank you."

--John Y.
Wausau, Wisconsin

"For 24 years I have been helping to re-design perceptions and organizations, and I must say that your book is the absolute best economics teaching tool I have come accross and beleive me I have researched and experienced much."

--Peggy Zetler
Progressive Input
Dillon, MT

Direct Pointing to Real Wealth \$20.00

Quantity:

-Discount-

-Order both *Direct Pointing* and *Living Homes* and save \$5.00.-
-Order all four of Tom's books and save \$20.00.-

Direct Pointing + Living Homes \$40.00

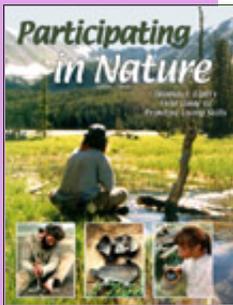
Quantity:

Living Homes + Direct Pointing to Real
Wealth + Participating in Nature + \$75.00
Botany in a Day

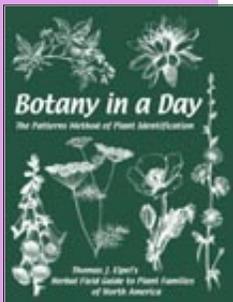
Quantity:

Upgrades: If you own any previous edition of *Direct Pointing to Real Wealth*, then

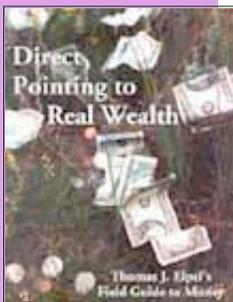
[Living Homes](#)



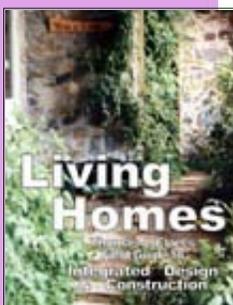
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

you can tear out the **bibliography page** and mail it in to "upgrade" to the new edition for just \$10 + postage. Please mail the coupon and check or credit card info to our address below.

Check out these articles adapted from
Direct Pointing to Real Wealth:
Thomas J. Elpel's Field Guide to Money

[Calories](#)

[Wealth & Work](#)

[The Most Important Ideas of the New Millennium](#)

(Books and ideas that were influential to *Direct Pointing to Real Wealth*)

Unique Books & Videos by Thomas J. Elpel

[Participating in Nature:](#) *Thomas J. Elpel's Field Guide to Primitive Living Skills*

[Botany in a Day:](#) *The Patterns Method of Plant Identification*

[Direct Pointing to Real Wealth:](#) *Thomas J. Elpel's Field Guide to Money*

[Living Homes:](#) *Thomas J. Elpel's Field Guide to Integrated Design & Construction*

[The Art of Slipform Stone Masonry](#) *Video Companion to Living Homes*

The Art of Nothing Wilderness Survival Video Series

(Recorded on quality recycled VHS video tapes.)

[3 Days at the River](#) *with nothing but our bare hands.*

[Mountain Meadows](#) *camping with almost nothing but the dog.*

[Mountain Lakes](#) *a survival fishing trip.*

Return to [Books & Videos by Thomas J. Elpel.](#)

Return to the [HOPS Press, LLC Home Page.](#)



How to Place Retail Orders

[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

[Granny's Country Store Departments](#)

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)



HOPS Press, LLC

Thomas J. Elpel's
Web World Portal



Granny's Country Store

- [Tom's Books & Videos](#)
- [Primitive Wilderness Survival](#)
- [Nature, Wildlife & Tracking](#)
- [Plant Identification & Ecology](#)
- [Home-Building Books](#)
- [Green Goods for the Home](#)
- [Books & Gifts for Kids](#)

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

- Tom's Journals
- Skills Articles
- Directory of Schools

Sustainable Living

- Alternative Construction
- House-Building Classes
- Articles & Resources
- Ecological Economics

Wildflowers & Weeds

- Plant Identification
& Edible Plants
- Rangeland Ecology
- Weed Control Alternatives

Society of

Primitive Technology

- Bulletin of Primitive
Technology
- On-line Articles
- Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders
are processed by:

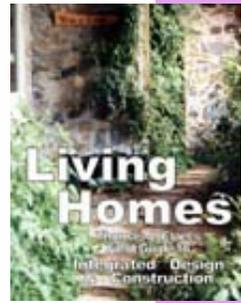
Granny's

Living Homes

Thomas J. Elpel's Field Guide to Integrated Design and
Construction

4th Edition, May 2001

The house of your Dreams does not have to be expensive. The key is all in the planning. How much a house costs, how it looks, how comfortable it is, how energy-efficient it is--all these things occur on paper before you pick up even one tool. A little extra time in the planning process can save you tens of thousands of dollars in construction and maintenance. That is time well spent!



Living Homes takes you through the planning process to design an energy and resource efficient home that won't break the bank.

Then, from the footings on up to the roof, author Thomas J. Elpel guides you through the nuts and bolts of construction for slipform stone masonry, tilt-up stone walls, log home construction, building with strawbales, making your own "terra tile" floors, windows & doors, solar water systems, masonry heaters, framing, plumbing, greywater, septic systems, swamp filters, painting and more!

After four years of development and three comb-bound draft versions, *Living Homes* is finally available in a full color cover with paperback binding. *Living Homes* is **220 pages**, including an incredible **300+ drawings and grayscale photos**. 4th Edition. May 2001. **Cost \$25.**

Be sure to read my on-line article [Building a House on Limited Means](#)

Check out this [Castle built by a person who read Living Homes](#)

Here is a brief overview of the [Log Construction](#) featured in *Living Homes*

Also be sure to see

[The Art of Slipform Stone Masonry](#)
video companion to the book *Living Homes*.

-Environmental Note-

Everything but the cover is printed with **soy ink**
on **100% post-consumer recycled paper, bleached without chlorine.**

\$1 from every book sold is donated to the Institute for Solar Living
to support their work promoting sustainable living through inspirational environmental
education.

-Please Scroll Down for our On-Line Ordering Form-

Table of Contents

Introduction:

- **Building a House on Limited Means:** *The Elimination of all that is Unnecessary to Achieve a Dream*

Part I: Dreams, Goals & Ecology

- **Integrated Design & Construction:** *Homesteading in the 21st Century*
- **Choosing a Location:** *Planning a Thousand Years into the Future*
- **Disaster-Proofing Your Home:** *Preventing the Obvious. Preparing for the Inevitable*
- **Defining Your Goals:** *A Blueprint is the Sum of the Criteria*

Part II: Principles of Energy Efficiency

- **Principles of Energy Efficiency:** *Designing Warm Houses for Cold Climates*

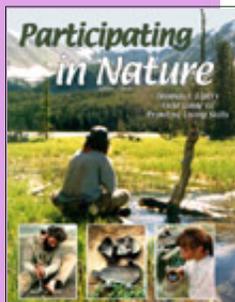
Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

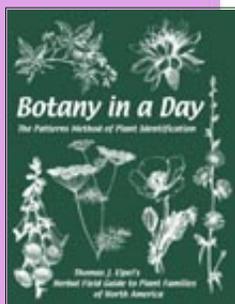


This Website Created on a lovable
Macintosh computer!

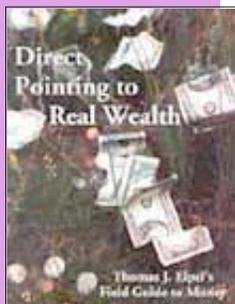
Books authored by
Thomas J. Elpel



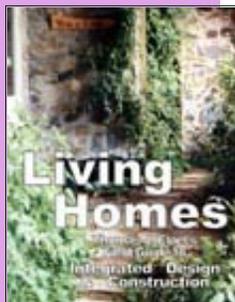
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



- **Insulation & Insulation Systems** *Many Choices, Most of Them Bad*
- **Thermal Mass:** *How to Capture, Store, and Release Heat*
- **Solar Input:** *Passive & Active Solar Systems*
- **Heating Systems:** *For Backup Heat & Hot Water*
- **Rethinking Appliances:** *Passive Cold Refrigerators & Other Gizmos*
- **Air Quality:** *Finding Fresh Air in an Air-Tight Home*

Part III: Water Supply & Management

- **Water Supply & Management** *Squeezing More Use out of Less Water*
- **Wastewater Management and Reuse** *Closing the Loop on Water Waste*

Part IV: The Nuts & Bolts of Home-Building

- **Footings, Foundations and Floors:** *Starting from the Bottom Up*
- **Cement Mixing & Measuring Guide:** *Including Aggregates, Additives, and Reinforcement*
- **The Art of Slipforming:** *A Stone Masonry Primer*
- **Tilt-up Construction:** *Exploring Time-Saving Methods of Stone Construction*
- **Log Building Basics:** *For Builders with Little Time or Experience*
- **Building with Bales:** *It's Cheap, Fast, and Energy Efficient*
- **Putting the Roof On:** *The Search for Better Solutions*
- **Windows & Doors:** *Putting a Plug in the Thermos*

Part V: Finishing the Interior

- **Revival of the Masonry Stove:** *An Old, but Efficient Heating System*
- **Terra Tiles:** *Hand-Made Tile Floors from Sand, Cement, Dirt, and Dye*
- **Wood Frame Construction:** *Building Interior Floors & Walls*
- **Practical Plumbing:** *Important Tips I Could Have Used*
- **Electricity:** *Wiring the Alternative Home*
- **A Primer on Paint:** *Reuse & Recycling*

Conclusion: *The End of the Beginning*

Bibliography

Index

Living Homes: Integrated Design &
Construction \$25.00 Quantity:

-Discount-

-Order both *Direct Pointing* and *Living Homes* and save \$5.00.-

-Order all four of Tom's books and save \$20.00.-

Direct Pointing + Living Homes \$40.00 Quantity:

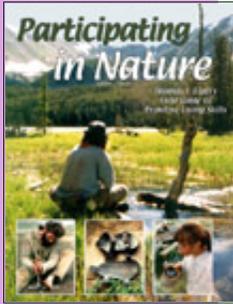
Living Homes + Direct Pointing to Real
Wealth + Participating in Nature + \$75.00 Quantity:
Botany in a Day

Discount: Order both *Living Homes* and *The Art of Slipform Stone Masonry* and
save **\$5.00.**

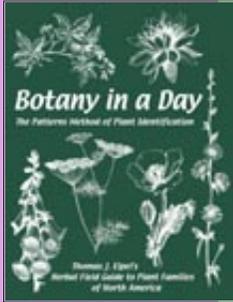
Living Homes + Slipform Stone
Masonry \$45.00 Quantity:

Upgrades: If you own any previous edition of *Living Homes*, then you have a coupon
in the back of your book to "upgrade" to the new edition for just \$10 + postage.
Please mail the coupon and check or credit card info to our address below.

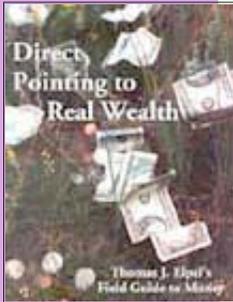
[Living Homes](#)



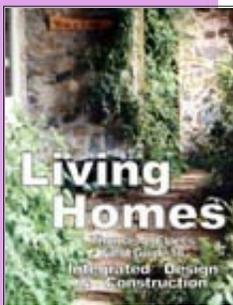
[Participating in Nature](#)



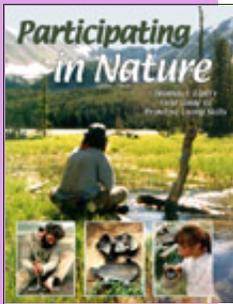
[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)

Unique Books & Videos by Thomas J. Elpel

Participating in Nature: *Thomas J. Elpel's Field Guide to Primitive Living Skills*

Botany in a Day: *The Patterns Method of Plant Identification*

Direct Pointing to Real Wealth: *Thomas J. Elpel's Field Guide to Money*

Living Homes: *Thomas J. Elpel's Field Guide to Integrated Design & Construction*

The Art of Slipform Stone Masonry *Video Companion to Living Homes*

The Art of Nothing Wilderness Survival Video Series

(Recorded on quality recycled VHS video tapes.)

3 Days at the River *with nothing but our bare hands.*

Mountain Meadows *camping with almost nothing but the dog.*

Mountain Lakes *a survival fishing trip.*

[Return to Books & Videos by Thomas J. Elpel.](#)

[Return to the HOPS Press, LLC Home Page.](#)



How to Place Retail Orders

[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store

PO Box 684

Silver Star, MT 59751-0684

406-287-3605

[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

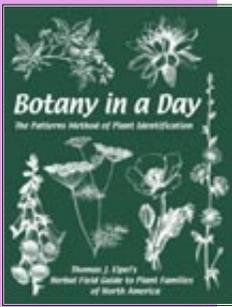
[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

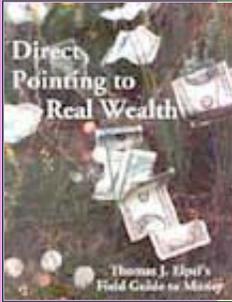
[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

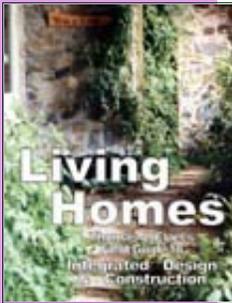
[Books & Gifts for Kids](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Thoughts on being prepared...

Welcome to my emergency preparedness web site.

There's quite a bit here and I am adding stuff all the time, so come on back every so often. If people request pages on particular subjects, suggest links that are really good or turn me on to other resources, I'll be happy to put them in. Likewise, if you e-mail me something you'd like published, I might just include that as well if it fits with my philosophy.

[Click Here!!!](#)

[A novel of survival and death, good and evil, now in search of an agent or publisher](#)

Table of contents:

[Something Personal](#)

[Surviving Life](#)

[Be Prepared](#)

[...Analyze the threat](#)

[...Generate a plan](#)

[...Inventory your assets](#)

[...Optimize existing assets/Devise work arounds](#)

[...Acquire new assets ...Practice](#)

[Fear](#)

[Survivalism](#)

[Links](#)

And don't forget to hit the links embedded in the text...



[Take time to give blood to the Red Cross as we mourn our losses and prepare to mete out justice.](#)



This SurvivalRing site,
Thoughts on preparedness... ,
is owned by [Fred Heiser](#) .

Want to join the
[SurvivalRing?](#)



[\[Skip Prev\]](#) [\[Prev\]](#) [\[Next\]](#) [\[Skip Next\]](#) [\[Random\]](#) [\[Next 5\]](#) [\[List Sites\]](#)
[\[Home\]](#) [\[Stats\]](#)



Ellis Well Drilling

8918 North Point Rd Roland, AR

(501) 868-5978

(501) 821 4801

Serving western Pulaski and surrounding counties since 1950

Home Page

[About Ellis Well Drilling](#) [Water Well Info](#)
[Links](#) [SR. Driller](#)



Bud Ellis Owner Operator

Drilling **\$6.00 per Foot**

4" Well Casing **\$3.00 per foot**

6" Well Casing **\$3.00 per foot**

Pea Gravel **Included**

Cement **Included**

Disclaimer: Ellis Well Drilling Cannot be held responsible for the *Quantity* or *Quality* of water you get from your well and the *Depth* of the well cannot be predetermined. Payment is due in full upon completion of drilling.

Actually yer just hirin us to punch a hole in yer property, were all just hopin it leaks!

Thanks and please give us a call.

(501) 868-5978

(501) 821 4801



This SurvivalRing site, Ellis
Water Well Drilling , is owned
by [Eddie Buie](#) .
Want to join the
[SurvivalRing](#)?



[\[Skip Prev\]](#) [\[Prev\]](#) [\[Next\]](#) [\[Skip Next\]](#) [\[Random\]](#) [\[Next 5\]](#) [\[List Sites\]](#)
[\[Home\]](#) [\[Stats\]](#)

Ed Buie, Web *disaster*Master Buie@aol.com



Pioneer

Emergency Preparedness Products

Pioneer, California

Toll-Free: 1-800-330-4234

[Email us!](#)

ALERT LEVEL

ELEVATED

Please note: We ship our products only to addresses in the Continental United States.

Emergency Preparedness Products:

[Solar Crank Radios](#)

[Pump & Solar Powered Emergency Flashlights](#)

[High-Filtration Face Masks](#)

[Portable Water Filter](#)

[Preparedness Books](#)

[Shipping/Ordering Information](#)



[Links](#)

Survival Top Sites

Powered by [RingSurf!](#)

SURVIVAL & PREPAREDNESS WEB RING

[\[Next\]](#) [\[Next 5\]](#) [\[Prev\]](#) [\[Prev 5\]](#) [\[Random\]](#) [\[Site List\]](#) [\[Join\]](#)



This [SurvivalRing](#) site is owned by
[Pioneer Preparedness Products](#)

Want to join the [SurvivalRing](#)?



[\[Skip Prev\]](#) [\[Prev\]](#) [\[Next\]](#) [\[Skip Next\]](#) [\[Random\]](#) [\[Next 5\]](#) [\[List Sites\]](#) [\[Home\]](#)
[\[Stats\]](#)

Search

All content of this website is © Copyright 1998 - 2003, Paradise Distributing, Pioneer, CA 95666.
All rights reserved.

Survive-All®

About Us

Products

Customers

**Disaster
Preparedness**

**Related
Links**

Welcome to the Survive-All web site! We provide disaster preparedness kits and accessories, making it simple and affordable for you and your family to be prepared for emergencies and weather related calamities. Don't wait until catastrophe strikes , order a Survive-All Pack for Hurricanes, Tornadoes, Earthquakes, Floods, and just about anything else, today!

You can go straight to our secure on-line store to shop for a Survive-All Pack or accessory. Click enter!

Enter



FC 77421

FastCounter by bCentral

We encourage you to contact us with any comments for improving this web site. E-Mail: tammy@surviveall.com

This site is a member of WebRing. To browse visit
<http://ss.webring.com/navbar?f=l&y=wolfie1012&u=10010159>

Bookmark this page and return often for updated survival information!



Member Sites	731
Queue Sites	5
Ringleaders	5
Email Lists	9

[ABOUT US]

[Home](#) | [What's NEW?](#)
[What is SurvivalRing?](#) |
[Join SurvivalRing](#) |
[Supporting Us](#) | [F.A.Q.](#) |
[Navigation Info](#) | [Site Map](#) |
[Your Hosts](#) | [Privacy](#) |
[Topics](#) | [Meetings](#) | [First Time Here?](#)

[MEMBERS]

[Full List](#) | [Fast List](#) | [Search](#)
[Statistics](#) | [SurvivalRING of HONOR](#) | [Community](#) |
[Site Management](#) |
[Advertising](#) | [RingWear](#)

[COMMUNICATE]

[Contact Us](#) | [Y2k Media Help](#) | [Feedback](#) |
[SurvivalRing Association](#) |
[Sign Guestbook](#) | [Read Guestbook](#) | [Classifieds](#) |
[Free-for-all Links](#) |
[Personals](#) | [UltraBoard BBS](#) |
[Email Lists](#)

[NEWS]

[In The News](#) | [SurvivalRing Newsletter](#) | [ALERT List](#) |
[Reviews](#) | [Articles](#) | [Other Sources](#) | [Your Thoughts](#) |
[Press & Publicity](#) | [The Survival WATCHDOG](#) |
[The BUGOUT Meter](#)

[HELP]

[Need Help Joining?](#) | [Hints and Tips](#) | [Volunteer Your Time?](#) | [Translate](#)

[Y2K]

[Y2k Thoughts](#) | [Y2k Scams](#) |
[Y2k-Nega-Doomers](#)

Support SurvivalRing-Buy your Civil Defense related books and material from us!

Survival Ring - The ORIGINAL Survival and Preparedness Webring

Statistics

These statistics are current as of **March 1, 2000**

Here's some news...SurvivalRing was ranked within the top 100 webrings several times last year, with the highest placement being 48th most popular webring in the world, out of over 86,000 rings currently in existence. Currently the webring is undergoing massive ring maintenance to weed out the sites that disappeared AFTER y2k passed us by. The missing sites are the main reason for the very low numbers, and the rock bottom numbers of the SITES RECEIVING HITS info. This WILL be fixed. Please bear with us as we get updates done. Some of the automatic site checking funtions of WEBRING are also intermittently available and all work is having to be done by hand right now.

THANKS to all Ring members and visitors to the ring for helping support our work. Stay tuned...more news coming. Check our [homepage](#) for all updates.

SYSTEM MESSAGE: Webring.org recently made some major updates to their system, including updating the software and CGI programs, adding many new servers, and oh yes, moving from California to Washington state. One of the results is that the **Statistics data** had to be reset to 0. A bug also found in the software was overstating the ACTUAL hits, using 28 weeks worth of data instead of the 8 weeks as was planned. This affects some numbers from the system regarding hits that are counted via the Webring.org system. Sorry for any problems that might arise from this, but obviously the situation was not within my control. Webring is also working on NEW Stats tracking tools, and these will be integrated as soon as they become available to users.

-- Richard Fleetwood - Ringmaster --
 -- March 1st, 2000 --

Traffic over past 8 weeks:

Total Hits:	30483
Next:	5
Skip:	0
Previous:	0
Skip Previous:	1642
Next/Previous 5:	5089

[OTHER STUFF]

[Free Software](#) | [Graphics Gallery](#) | [Linking to us](#) | [The Book Bunker](#) | [Site Design/Info](#) | [Our Awards](#) | [Publishers](#)



Click above to visit the [SurvivalRing Camping VStore!](#) Get supplies, tools, and more and SAVE!
Be notified automatically when this page is updated
e-mail address:

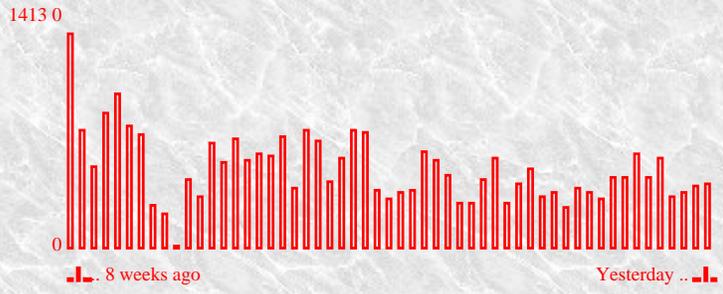
Help Support Our Work here!



Books, videos, music, and much more!



List:	11916
Random:	62



25 Most Active Sites

Ranked:	8wks	2wks	Site
1	450	104	Frugal Squirrel's Home Page for Patriots, Survivalists,
2	439	61	I Corps Supply
3	420	130	Coat Hangers and Duct Tape
4	301	39	40-Acre Farm/Homestead For Sale-N.E.PA
5	296	56	Survivalstop
6	276	54	War Shamen's Earth Lodge
7	272	49	Rocky Mountain Survival Group
8	231	45	BUILDING YOUR ARK
9	214	36	Captain Dave's Survival Center
10	186	41	TOM BROWN, Jr's Tracking, Nature, and Wilderness Surviv
11	173	39	Basin Wood Cook Stoves
12	169	35	Noah's Ark
13	165	37	Back to Basics
14	165	21	Survival Instinct
15	163	17	The Blast Shelter - Home Page
16	152	27	ARMYNAVY.COM - Online ArmyNavy Directory
17	134	29	DoubleOught's Survival Station
18	127	19	Self-Sufficient City Living
19	122	27	Midnight Community
20	121	23	SurvivalRing
21	120	19	Y2K warning
22	103	17	The Patriot War College
23	101	14	Help with Y2K Survival Preparation
24	99	20	Hoods Woods
25	91	19	Doomsgate 2002

[[All Sites](#)]

Top 25 Sites Receiving Traffic from the WebRing

Ranked:	8wks	2wks	Site
1	2	0	F-5 in Oklahoma The survivors Page

2	2	1	Frozen Dog Ridge
3	1	0	Even-Wolves-Dream
4	1	0	Y2K-BC Email List Home Page
5	1	0	Y2K Tanks: Fuel and Water Storage Tanks
6	1	0	Water Filters
7	0	0	Militia Report - Columbiana County, Ohio
8	0	0	CK FARMS Y2K SURVIVAL FOOD AND CANDLES
9	0	0	BLUE MOUNTAIN SURVIVAL READY PREPAREDNESS CENTER
10	0	0	Survival Help Sites
11	0	0	Y2K Newsletter and Y2K products
12	0	0	The Attitude Of Survival
13	0	0	World Survival Institute
14	0	0	Y2K Workshop
15	0	0	Preparing and Protecting your Home and family for Y2k
16	0	0	Amulet of the Backwoods: The SURVIVALIST HomePage
17	0	0	Are You Y2K Concerned?
18	0	0	Y2k Media Help Page - SurvivalRing
19	0	0	Operational Information
20	0	0	War Shamen's Earth Lodge
21	0	0	HealthWorks - Your Vitamin & Supplement Source for Y2K
22	0	0	Y2K Survival Information
23	0	0	Basin Wood Cook Stoves
24	0	0	Help with Y2K Survival Preparation
25	0	0	Aqua Doctor

[[All Sites](#)]

[[Survival Ring - Homepage](#) | [SurvivalRing SEARCH](#) | [Webring Home](#)]



Please note...SurvivalRing² is still in BUILD mode...still being written as we speak....give me a few weeks and it'll all be done.... thanks....



Join the **SurvivalRing** mailing list!
Enter your email address below,
then click the 'Join List' button:

[Powered by ListBot](#) | [View List Archive](#)



[\[ABOUT US\]](#) Home|What's NEW?| What is SurvivalRing? | Join SurvivalRing | Supporting Us | F.A.Q. | Navigation Info | Site Map | Your Hosts | Privacy | Topics | Meetings | First Time Here? | **[MEMBERS]** Full List | Fast List | Search | Statistics | SurvivalRING of HONOR | Community | Site Management | Advertising | RingWear | **[COMMUNICATE]** Contact Us | Y2k Media Help | Feedback | SurvivalRing Association | Sign Guestbook | Read Guestbook | Classifieds | Free-for-all Links | Personals | UltraBoard BBS | Email Lists | **[NEWS]** In The News | SurvivalRing Newsletter | **ALERT** List | Reviews | Articles | Other Sources | Your Thoughts | Press & Publicity | The Survival WATCHDOG | The BUGOUT Meter | **[HELP]** Need Help Joining? | Hints and Tips | Volunteer Your Time? | Translate **[Y2K]** Y2k Thoughts | Y2k Scams | Y2k-Nega-Doomers | **[OTHER STUFF]** Free Software | Graphics Gallery | Linking to us | The Book Bunker | Site Design/Info | Our Awards | Publishers



Site Design by

and

The phrase SurvivalRing, the various SurvivalRing graphics, and the associated SurvivalRing LOGOS on this website are all **COPYRIGHT** by Richard Fleetwood ©1997-2000, All Rights Reserved.

USE STATEMENT: Your loading of this page into your system browser for reading of content signifies acceptance that any reply from you, via email, fax, guestbook, or other written or electronically sent data **MAY** be used within this website in the context found appropriate to this website. If you do **NOT** wish to have your email/etc. used in this way, then do not send anything in the ways described within this **USE STATEMENT**. All threats, insults, implied violence, or other nasty and infantile comments **WILL** be responded to online on this website, and **WILL** be dealt with appropriately by contacting the necessary authorities **AT MY DISCRETION**.

Unauthorized use, reproduction, or reposting is strictly prohibited.

Last Modified: March 1, 2000	URL: ringstats.htm
Author: Richard Fleetwood	Email: rafleet@aol.com

Study...Prepare...Live.
Yesterday Today Tomorrow
Survival, Preparedness & Y2k...its here for you.





Hollowtop Outdoor
Primitive School, LLC **Thomas J.
Elpel's**
[Web World Portal](#)



[Granny's Country Store](#)
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#)
[Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#)
[Green Goods for the Home](#)
[Books & Gifts for Kids](#)

[HOPS Press, LLC](#)
Self-Service
Instant Wholesale Discounts

[Primitive Living Skills](#)
**Hollowtop Outdoor
Primitive School, LLC**
Tom's Journals
Skills Articles
Directory of Schools

[Sustainable Living](#)
Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

[Wildflowers & Weeds](#)
Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

[Society of
Primitive Technology](#)
Bulletin of Primitive
Technology
On-line Articles
Subscription Information

[3Rivers Park](#)
A Place for People
Help us Secure the Rivers!

[What's New?](#)
See what's new
on all our websites!

HOPS Press, LLC
website orders
are processed by:

**Granny's
Country Store**
PO Box 684



**Thomas J. Elpel's
Hollowtop Outdoor Primitive School, LLC**

2004 Hollowtop Class Schedule

-Silver Star, Montana-
Updated December 4th, 2003

Nature: Who knows? Who Cares?

by Thomas J. Elpel, Director of Hollowtop Outdoor Primitive School, LLC

People naturally care about whatever they are familiar with. For example, someone who knows about football-- the rules, the teams, and the players-- will naturally care about anything and everything that happens in football. Similarly, anyone who knows about nature will inevitably care about the natural world. So stop for a moment and ask yourself about the future of the natural world. Imagine all the people you have ever met in your life and ask yourself, "Who knows? And who cares?"



The bottom line is that if people are going to care about the natural world, then they have to know about it. To know about nature they have to get involved. The greatest advocates for fish habitat are fishermen. The biggest advocates for wildlife are hunters. The principle advocates for wilderness are those who use it. The best advocates for wild rivers are those who get out and paddle them.

Here in Montana we have had a great tradition of outdoor sports for generations. Until recent times, this has remained a wild place where people lived, worked, and played in the outdoors, in part because there simply were few alternatives. Although I lived in California until I was twelve, my parents were both from Montana and we spent our summers here with my grandmother. She lived out of town, and up a creek, where she had neither a television nor a radio. My brothers and sisters and

cousins and I played all summer long in the outdoors, fishing and swimming in the creek, building forts, picnicking, and hiking.

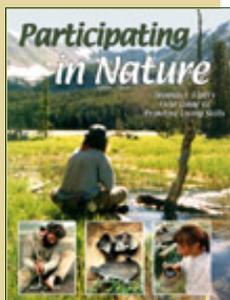
Things are different for kids now. Television and computers provide easy entertainment, so that kids never have to go outside to find something to do. Good cars and good roads make it possible to cruise sixty or more miles into town just to watch a movie. School sports and school activities keep kids so busy that they wouldn't have time to explore the great outdoors if they wanted to.

Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

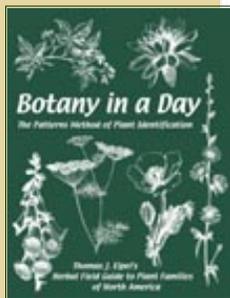


This Website Created on a lovable
Macintosh computer!

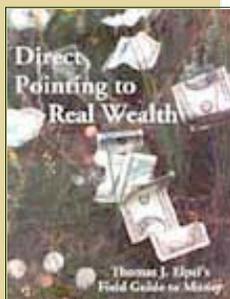
Books authored by
Thomas J. Elpel



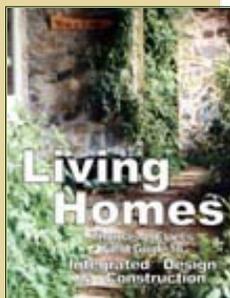
[Participating in Nature](#)



[Botany in a Day](#)

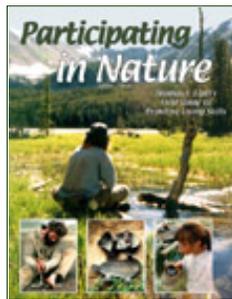


[Direct Pointing to Real Wealth](#)



[Living Homes](#)

It has been shocking to me to meet more and more teenagers who have lived here all their lives, yet have never been camping. Many have never seen our jewel-like mountain lakes just a few miles away from home. They don't go outside to play, except on manicured lawns with manufactured sports equipment. They are afraid of bugs. They are afraid of nature. It makes me wonder who will be left to care about our natural resources in a generation or two if nobody goes out into the real world to play any more.



Since founding Hollowtop Outdoor Primitive School, LLC in 1991 our Dream has been to get more people involved in nature, so that more people would care about nature and become better stewards of this world. We have offered classes in a variety of formats from specialized workshops on topics such as plant identification or hide tanning to extended survival camping trips. For a while we even hosted a primitive skills rendezvous at our five-acre home site on the edge of town.

Along the way we have often felt that we were preaching to the choir-- reaching only the people who were already dedicated students and stewards of nature. We found ourselves asking, "How can we reach out to a more mainstream audience?"

Today our school is in a state of transition. After years of running our classes and our internet bookstore from our house, we finally bought a place called **Granny's Country Store** and moved our business right down onto main street in Silver Star, Montana. Silver Star is only about 4 blocks long, but it is right on the tourist strip for people following the Lewis & Clark trail, as well as those headed to or from historic Virginia City, Montana. Granny's Country Store is basically a small convenience store that includes the town post office. So, in this unexpected twist of fate, we now run the post office, and sell pop and beer and nature books. We are keeping our home in Pony.

What we were searching for, and what we found, was a business that would give us a front door on main street with a backdoor to the wilderness. Granny's Country Store is indeed on main street, and the Jefferson River is right out the back door. Already it has been fascinating to meet our neighbors, to hear stories from the old-timers, and to discover how many people around us share common interests. We believe our new location will enable us to more effectively reach out to cultivate greater interest in the natural world.



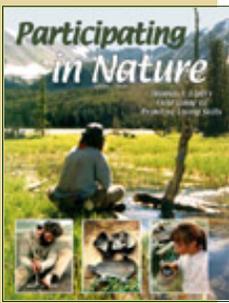
At this point, the bookstore is already up and running well. We are now developing our "outreach" programs to provide hands-on instruction in primitive outdoor skills under a Lewis & Clark theme. Basically, we will have Lewis & Clark Living History Programs and Guided Canoe Trips, designed especially for tourists in summer and school kids in the spring and fall. For those who are seeking an extended learning experience, we now have several Primitive & Sustainability Internship openings. All our offerings are described in detail below.

Lewis & Clark Living History Programs

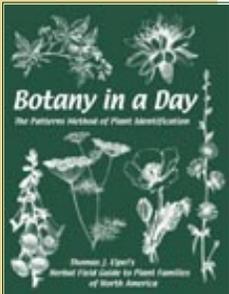
Available Memorial Day weekend through Labor Day weekend 2004



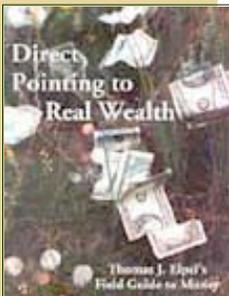
Come to Silver Star, Montana for hands-on lessons on the skills used by Lewis and Clark and the Native Americans they encountered along their epic journey across the continent.



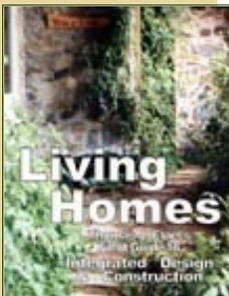
[Participating in Nature](#)



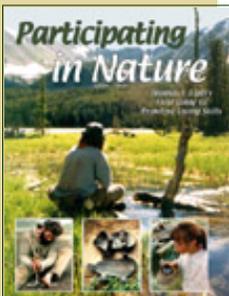
[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



Anyone is welcome to drop by at any time throughout the summer for demonstrations of many essential skills, including primitive fire-making, tanning hides and making clothing, making a dug-out canoe, wild edible and medicinal plants, primitive shelter construction, primitive cooking methods, and primitive weaponry.

There is no cost to stop by and look around. If there is a particular skill you are especially interested in learning then you can hire our staff right on the spot to guide you through the process.

Class-length depends on the type of skill you want to learn, and may vary from an hour-long class in primitive fire-making, to a three- or four-day class if you want to tan a deer skin. Please call ahead if there are specific skills you want to learn when you arrive, and we will do what we can to accommodate your needs. Costs will depend on the length of class and the materials required for the class. Discounts will be available for Montana residents. To make advance reservations, please click over to our [Contact Page](#) and tell us about yourself, when you can come, and what you are especially interested in learning here.

Also see our favorite [On-line Journals of Lewis & Clark.](#)

Lewis & Clark Living History Canoe Trips

Available Memorial Day weekend through Labor Day weekend 2004
(as water and weather permissions allow)

Looking for an adventure by canoe? The Jefferson River has been described by some as being like an "African Safari" with its abundance of wildlife and wild places, which is remarkable, given that it is not at all remote. The river runs through farms and ranches, and alongside towns, roads, and highways. There is very little public land along the river, but still you can see an abundance of wildlife such as deer, moose, coyotes, beavers, muskrats, otters, and all kinds of ducks and geese, herons and pelicans, plus eagles, falcons, and hawks. In some sections of the river you will experience it almost unchanged from the days when Lewis & Clark saw it for the very first time.

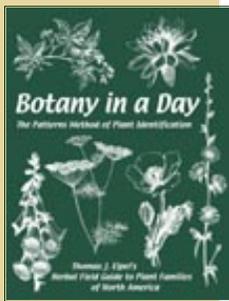


Scheduled Trip: Join us June 28th through July 4th for a journey back to the days of Lewis & Clark. We will paddle the historic Big Hole and Jefferson Rivers while rediscovering the skills of Lewis & Clark and the natives they encountered. Along the way we will build primitive shelters, make our fires with flint & steel and friction fire methods, forage for edible plants, weave baskets and cover basic camping and cooking skills.

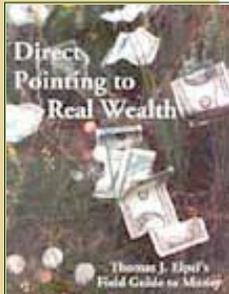
This class is suitable for beginners. We will not be doing hard-core survival skills. Instead, the emphasis will be on having a good time on the river, covering skills more for fun than for survival. All participants will be required to read and sign our [Liability Waiver and Release Form](#). Please also see our suggested [equipment list](#). **Cost: \$525.** (The price below is \$520. The other \$5 will automatically appear as "postage" when you place your order.)

Jefferson River Canoe Trip June 28th - July 4th, 2004 \$525.00

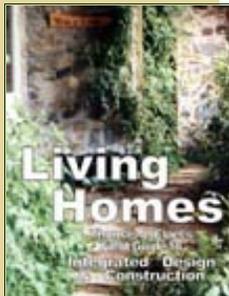
Quantity:



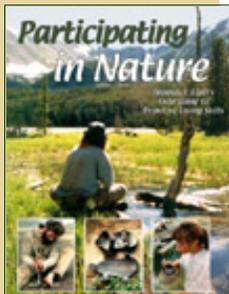
[Botany in a Day](#)



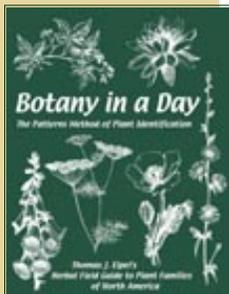
[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



[Botany in a Day](#)

Unscheduled Trips: Stop by Granny's Country Store in Silver Star, Montana any time throughout the summer and our staff will be ready to take you on a guided adventure, ranging from a half-day scenic tour to a week-long primitive skills intensive trip. Better yet, call ahead for guaranteed reservations and let us know in detail what kind of an experience you are looking for. The cost is \$75 per person per day, or \$125 per couple per day. You can even rent a canoe and create your own adventure. (Rental prices have not yet been determined.) Discounts are available for Montana residents.

Availability of canoe trips is subject to river conditions. Sometimes in May and June the river can be too high for safe beginner float trips. By late July and August much of the river water is pulled out for irrigating, and the remaining flows require getting out and dragging the canoes across the shallow parts. All participants will be required to read and sign our **[Liability Waiver and Release Form](#)**. To make advance reservations, please click over to our **[Contact Page](#)** and tell us about yourself, when you can come, and what you would like to learn and experience here.

Living History Programs for Schools

Available in May, September and October

Over the years I have made an effort to work with the local school to get our kids' classes out one time each year for a primitive skills class. Most of these have been day trips, where we built shelters, did flint & steel or bowdrill fire starting, cooked ashcakes over the campfire, told stories, and did stalking games.

In May of 2003 I took the 7th grade class from Harrison School (Cassie's class) out for an overnight camping trip on a ranch on the Jefferson River, the same place where we shot the video "3 Days at the River" last year. The week before I had the 8th grade class (Felicia's class) out there for an overnight trip as well. Everyone had a great time and learned a lot. Working with school kids this way has become my favorite kind of teaching. It is really interesting to work with the same group of kids for one or two days each year over many years. They become comfortable in the woods in a way that you do not see with people that are coming for the first time. The 8th graders wrote journals of their experience, which were compiled into an **[on-line journal](#)**.



We want to work towards building a graduating outdoor skills curriculum for all the local schools, where even kindergarten kids would come out for a field trip, learn a few skills, and build on those skills through subsequent field trips each year until they were quite proficient in the outdoors-- and knowledgeable about ecology issues-- by the time they graduated from school.

With our new facilities in Silver Star we will be able to expand these programs. In May, when the weather is unpredictable, classes will involve skills such as shelter construction and campfire skills. Guided canoe trips will be available for the older grades in September and October. Costs are yet to be determined, but will be intended

to just barely cover our expenses. We may seek outside grants to help make these programs available to the schools.

Primitive & Sustainable Living Skills Internships

Positions Available Starting in April 2004

Are you looking for an extended, in-depth learning experience? Our primitive and sustainable living internships offer the opportunity to become proficient in primitive skills and primitive skills instruction, while long-term participants will also be able to participate in sustainable construction and green-business development projects. As a participant, here is a rough out-line of what you can expect:

April and May: Prepare for and work with school children teaching primitive survival and nature awareness skills with a Lewis & Clark theme. Plan on doing a lot of reading about Lewis and Clark.

June, July and August: Develop proficiency in your primitive skills while giving demonstrations, classes, and guided canoe trips to tourists. Over the course of the summer you will have the opportunity to master a wide variety of skills, from making an entire buckskin outfit to being confident in your plant identification ability. Most of the time you will be able to choose which primitive skills you want to focus on. You will simply be developing proficiency in front of tourists. You will be paid for any classes you teach.

In addition to the teepee encampment, we have a trailer house in Silver Star for rest and relaxation. For variety you can expect to help out part time in Granny's Country Store, and occasionally with construction or maintenance projects there or at our home in Pony. Of course you will also have time off to do whatever you want. Everything is flexible. We will strive to work together to accommodate our mutual needs.

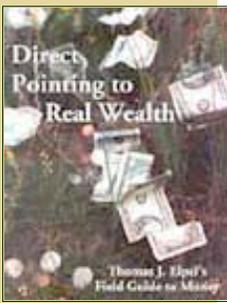
September and October: Plan on doing more work with school kids, including guided canoe trips with teenagers. We may also get you into Rabbitstick Rendezvous in Rexburg, Idaho, where you would be teaching part-time, but also free to take a variety of classes from primitive skills experts across the country.

To the extent that our financial situation and the weather allows, we will begin the process of replacing the trailer house with a passive solar home of stone masonry and strawbale construction. If we can get the footings and stonework completed before the really cold weather hits, then we will be able to continue with the log post-and-beam work, roofing, and strawbale infill throughout the winter... but that may be a tall order!

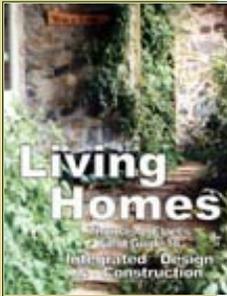
November through March: For those who are interested in a long-term experience, we will continue work on the passive solar home as weather and money permit. At any time during the year, but especially in winter, you will be encouraged to pursue a green business development project. The objective is to figure out how to bring environmentally friendly products and services to market. Possible projects range from the primitive-- such as figuring out how to get our tire sandal pattern into production-- to the industrial, such as helping to launch an environmentally friendly fast-food business. You may have your own green ideas you would rather pursue instead of ours. We will do what we can to help incubate your projects to become financially viable.

Other projects that you can expect to be involved in throughout the year include assisting with product reviews and website development, writing articles, helping out with our non-profit 3rivers Park organization, gardening, weed pulling, and just generally making yourself helpful around the business and community.

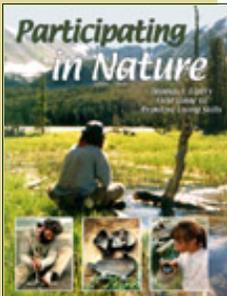
Duration: Internships start in April of 2004 and run through October, with the option of



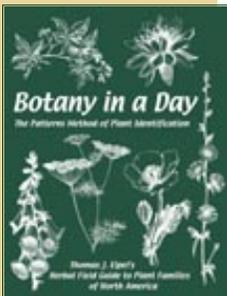
[Direct Pointing to Real Wealth](#)



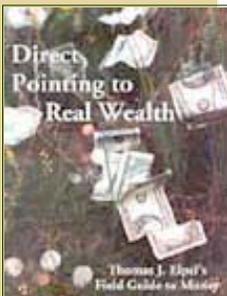
[Living Homes](#)



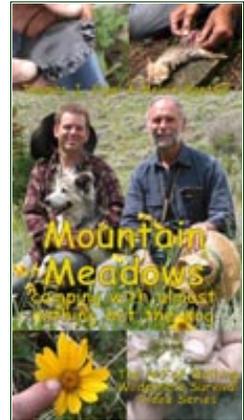
[Participating in Nature](#)

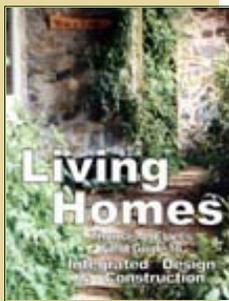


[Botany in a Day](#)

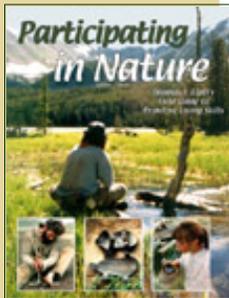


[Direct Pointing to Real Wealth](#)

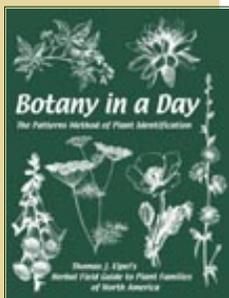




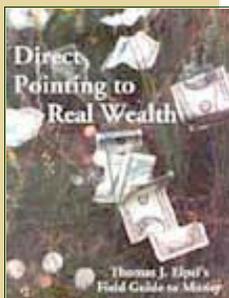
[Living Homes](#)



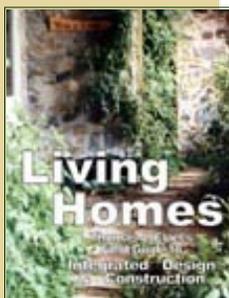
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

staying on after that if you choose. We will accept applicants first that can commit at least from April through October. If space is available, or you have extensive prior experience, then we may be able to accept an internship that starts later or ends earlier.

Cost and Potential Income: There is a one time sign-up fee of \$250. Lodging and basic food staples, (rice, beans, flour, oats, etc.) will be provided. You will have the opportunity to earn a limited income giving classes and canoe trips to tourists. Supplementary salary will be dependent on our financial situation and your skills as an instructor. Prior experience is helpful, but not required. It would also help to read my books, *Participating in Nature*, *Botany in a Day*, *Living Homes*, and *Direct Pointing to Real Wealth*, so you know where I am coming from philosophically. All interns will be required to read and sign our [Liability Waiver and Release Form](#)

Applications: We have already approved three male applicants for our 2004 internship program. Female applicants are still welcome. To apply, first read through our [Primitive & Contemporary Living Skills Internship FAQ's](#). Please give careful consideration before you contact us. When ready, you may click over to our [Contact Page](#) and send us a detailed biography of yourself, and tell us why you would like to serve as an intern here. We are looking for up to five interns this year, some male and some female.

To be notified of upcoming additions and changes to our class schedule, you are invited to join our **HOPS Classes Call List**. Please click over to our [Contact Page](#) and send an e-mail asking to be included on the HOPS Classes Call List. The list is not used for any other purpose, and it will not be shared with any other source. Expect to receive class updates 2-4 times a year.

3Rivers Park Canoe Trip Coming in 2004

This trip is in the initial stages of planning. The purpose is to promote our organization [3Rivers Park](#) and to raise awareness of the need to plan for the future of the Jefferson, Madison and Gallatin Rivers here in southwestern Montana.

The plan is to launch a flotilla of canoes down the Jefferson River to explore this natural wonder. This will Not be a "primitive" trip, as we will be tent-camping at public fishing access sites along the way. Nevertheless, we will cover some primitive skills like fire-starting and plant identification and uses.

There is no cost for the trip, although we would gladly welcome contributions to 3Rivers Park to help buy habitat for people and wildlife along the rivers.

Additional information on this trip, plus an equipment list and canoe rental information will be posted as it comes together. Be sure to sign up for our HOPS Classes Call List (see above) if you want to receive updates on this and other upcoming expeditions.

On-Line Discussion of Botany in a Day

Facilitated by Frank Cook

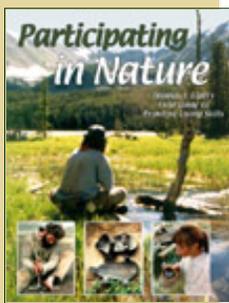
Starting June 2003

(Might be offered again in 2004)

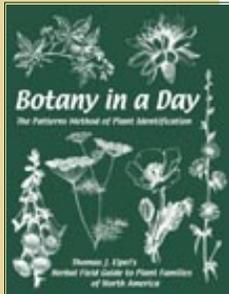
Hi There Friend of the Plants,

Over the past year I facilitated a collective read through of a book called "Botany in a Day" by Thomas Elpel. Though this medium of sharing is new to me, I felt the journey through went well and want to offer another opportunity to go through the book together. This is a wonderful book to serve as a resource for a discussion of plants.

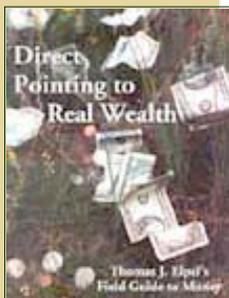
You are invited to join a circle of us reading through "Botany in a Day"-a section a week



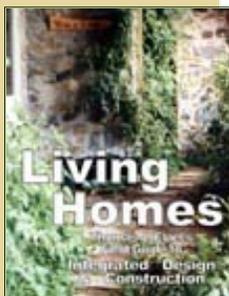
[Participating in Nature](#)



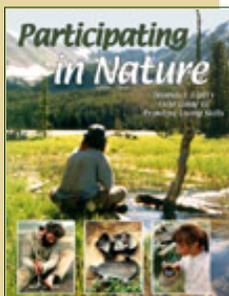
[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)

(or two). I believe it will take about 5 months exchanging an email a few times a month discussing the section read. (4 communications doing an overview of Botany and 8 communications reviewing plant families in North America).

Each week you will receive an email with comments from me of the section read as well as comments from others. You are encouraged to ask questions and contribute comments but are not required to.

If this sounds interesting to you, this is what you need to do: 1) Respond to me at planttalk2004@yahoo.com so I can add you to the circle. 2) Order yourself a copy of **Botany in a Day** Let them know it's for the Online Botany Circle facilitated by Frank Cook. They can get it to you in just a few days (unless they are out camping). 3) When you get the book, look it over and read up to page 3 and the inside covers. I'll be sending you the first email in June.

I look forward to hearing from you and hope you are able to participate in early spring opportunities.

Peace,

Frank Cook.

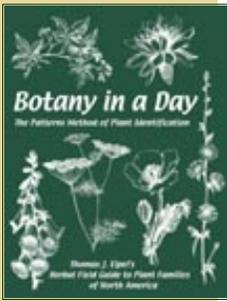
Dear Thomas,

My wife gave me Botany in a Day and Participating in Nature for my birthday in September.

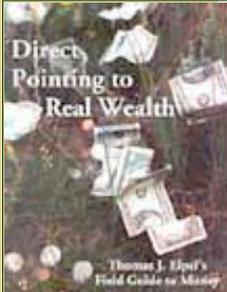
Botany in a Day is a revolutionary approach in the way that way that you introduce the family concept for "non-botanists". I teach botany courses (identification, ecology, conservation, edible and medicinal uses, etc.) at the Rocky Mountain Biological Laboratory near Crested Butte, Colorado. I've taught college students, biologists, land managers, and vacationers. I always try to take the family approach. I think it is a great way to organize the taxonomy of things in one's head instead of just learning about a bunch of plants. This is obviously an old system in the technical resources, but your use of it in a field guide is great.

In Participating in Nature, I particularly like the way you combine your philosophy in a journal style with discussion of specific skills. I also like very much how you emphasize those skills or variations on skills that you have adapted on your own. It is clear that you have spent much creative time in the woods. I have been very much an observer and student of the land in the past 10 years, but it has really only been in the past few years that I am becoming a participant. For example, I have a masters in botany with an emphasis in plant taxonomy. So it is now that I am going back and saying, "Oh, I didn't know that was edible!" or "Dang, I can make rope out of this?". I thought I knew the plants of the Colorado Rockies pretty well, and then I started eating them and realizing that my learning had just begun. I am getting pretty decent with a bow-drill and I've tanned a few dozen hides. But I realize I have the knowledge of about an 8 year-old Cheyenne boy. I am getting better at accepting that tomorrow is another day.

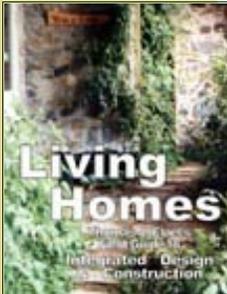
*--Kevin T.
Broomfield, Colorado
(used with permission)*



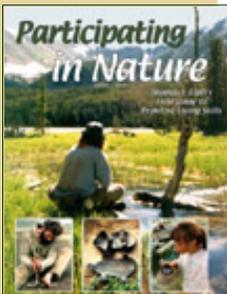
[Botany in a Day](#)



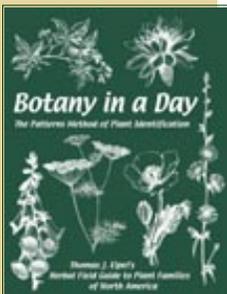
[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



[Botany in a Day](#)



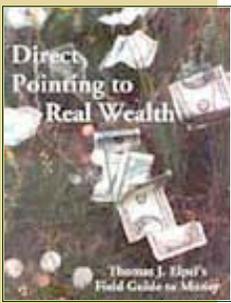
How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

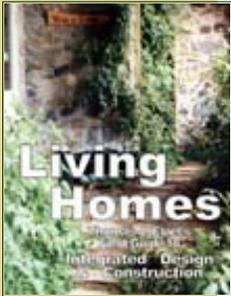
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

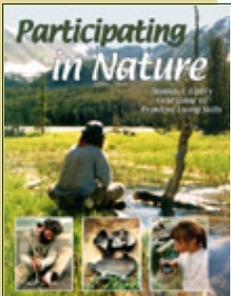
Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



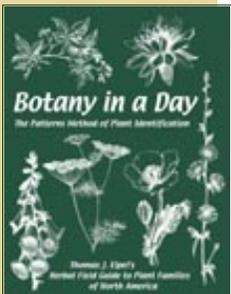
Direct Pointing to Real Wealth



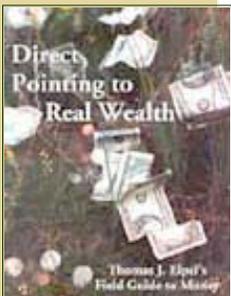
Living Homes



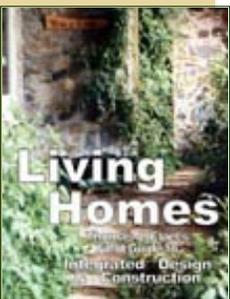
Participating in Nature



Botany in a Day



Direct Pointing to Real Wealth



[Living Homes](#)



Hollowtop Outdoor
Primitive School, LLC **Thomas J.**

Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos
Primitive Wilderness Survival
Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books
Green Goods for the Home
Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**
Tom's Journals
Skills Articles
Directory of Schools

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

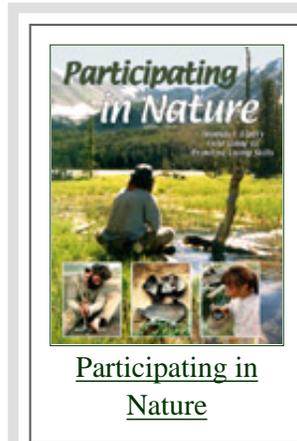
HOPS Press, LLC

website orders
are processed by:

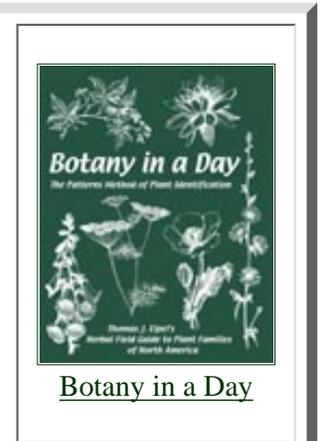
**Granny's
Country Store**

-Thomas J. Elpel's Web World-

www.Grannysstore.com
www.Hollowtop.com
www.HOPSPress.com
www.Wildflowers-and-Weeds.com
www.3riverspark.org
www.Primitive.org
Search Our Websites!



Participating in
Nature



Botany in a Day

A Few Other Search Engines

[Top 100 Sites Network](#)

[Web Crawler](#)

[WhatUSeek](#)

[Jumper Hot Links](#)

[LinkMonster](#)

[WhoWhere?](#)

[What's New](#)

[BizWeb](#)

[Jayde Online Directory](#)

[One World Plaza](#)

[RescueIsland](#)

[Where2Go](#)

[World Announce Archive](#)

[WWW Worm](#)

[YelloWWWWeb](#)

[Lycos](#)

[Excite](#)

[HotBot](#)

[Alta Vista](#)

[Galaxy](#)

[Infoseek](#)

[Access Business OnLine Official Classified Marketplace](#)

[JumpCity](#)

[BizCardz Business Directory](#)

[InfoSpace](#)

[JumpLink](#)

[Net-Announce](#)

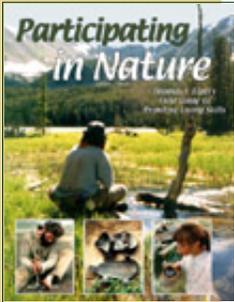
[Northern Light](#)

**PO Box 684
Silver Star, MT 59751-0684
406-287-3605
E-mail Contact Page**

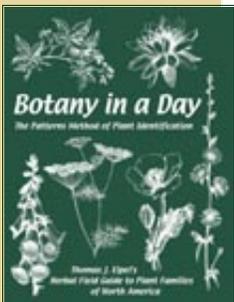


This Website Created on a lovable
Macintosh computer!

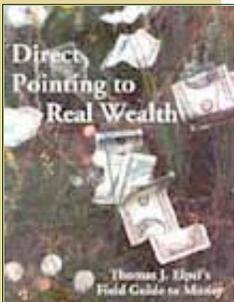
Books authored by
Thomas J. Elpel



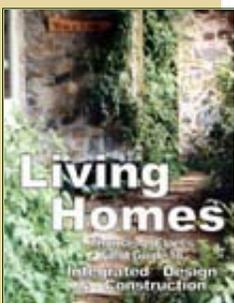
Participating in Nature



Botany in a Day

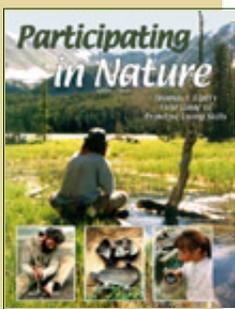


Direct Pointing
to Real Wealth

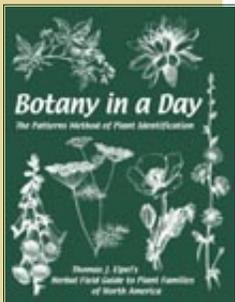


Living Homes

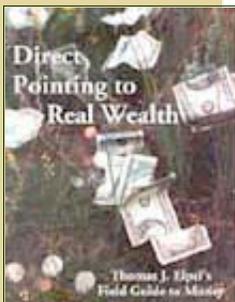
- [TurnPike](#)
- [Unlock:The Information Exchange](#)
- [Search](#)
- [All In One Internet Search Site](#)
- [ALIWEB](#)
- [PeekABoo](#)
- [Scrub The Web](#)
- [WebScout](#)
- [YeeHaa!](#)
- [Super Snooper](#)
- [Open Text](#)
- [Yahoo](#)
- [A N A N Z I](#)
- [Argus/Univ. of Michigan ClearingHouse](#)
- [Asia Trade](#)
- [ATEL's "What's Hot on the Web"](#)
- [BigBook Yellow Pages](#)
- [Starting Point](#)
- [Magellan](#)
- [i-Explorer](#)
- [What's New Too](#)
- [Apollo](#)
- [Self-Help](#)
- [Four 11 Corp.](#)
- [LinkMaster](#)
- [Infohiway](#)
- [Brian's Revised Internet Yellow Pages](#)
- [CANLink Directories](#)
- [City.Net \(virtual tourist II\)](#)
- [Cool Site of the Day](#)
- [Commercial Advertising and Marketing Server](#)
- [Computer and Communications Pages - Company Listings \(e-mail submissions to \[jed@webstart.com\]\(mailto:jed@webstart.com\)\)](#)
- [Scot Finnie\)](#)
- [The Crest Internet Index](#)
- [Darren's Free For All Page](#)
- [> EInet Galaxy](#)
- [Entrepreneurs on The Web](#)
- [The European Directory](#)
- [excite!](#)
- [Four11 White Page Directory](#)
- [Full Disclosure's Cool Links \(e-mail submission to \[glr@ripco.com\]\(mailto:glr@ripco.com\)\)](#)
- [wic@gnn.com\)](#)
- [GTE SuperPages](#)
- [Global On-Line Directory \(GoldSite Europe\)](#)
- [Ground Zero](#)
- [Groupweb Business Directory - InfoResearch](#)
- [Hay's Ways](#)
- [kennw@msn.com\)](#)
- [The Huge List](#)



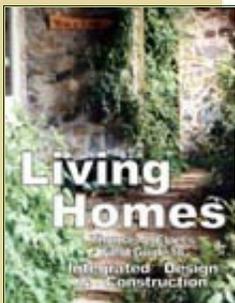
[Participating in Nature](#)



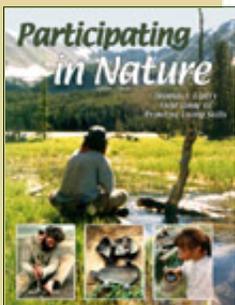
[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)

[InfoResearch - Groupweb Business Directory](#)

[Infoseek](#) (e-mail submission to www-request@infoseek.com)

[Inktomi](#)

[Innovator's Network Yellow Pages](#)

[inSites at iGuide](#)

[Internet Consultants Directory](#)

[Internet Mall](#)

[The Internet Public Library](#) (e-mail resource information to ipl@umich.edu)

[Internet Resources Database - Classified Link](#)

[IntIndex](#) (e-mail submission to gerryh@silverplatter.com)

[iWORLD WebPointer](#) (e-mail submission to webpoint@www.iworld.com)

[Josh's Sanctum Index](#)

[JumpCity](#)

[Lightning Web](#)

[LexiConn](#)

april@olywa.net)

[LinkMaster](#)

[LinkStar](#)

[Magellan](#)

[Manufacturers Information Net](#)

[Marshall's Hotlinks](#)

[The Meeting Place](#)

[MegaMall's Free for All Link Page](#)

[Microsoft Library](#) (e-mail submission to mslib@microsoft.com)

[Mother of All Link Page](#)

[Myanmar Free For All Link Page](#)

[Nerd World Media](#)

csteele@interlog.com)

[Net-Happenings](#)

[NetMall](#)

[Netscape's Escapes](#) (Suggest a Site to be reviewed on the [Netscape Feedback Form.](#))

[NetSearch](#)

[Network Buyer's Guide](#)

[Nihongo Yellow Pages](#)

[One World Plaza](#)

[Open Text Index](#)

[Point's Top 5% Nomination List](#)

[The PostMaster](#)

[PowWow White Pages](#)

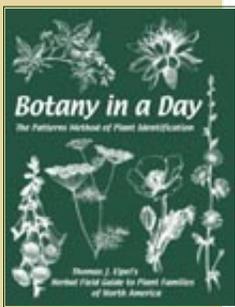
[Pronet International Business Directory](#)

[The Reciprocal Link Exchange!](#)

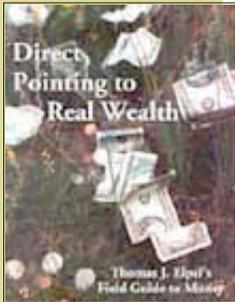
[Recyclinx](#)

[REX](#)

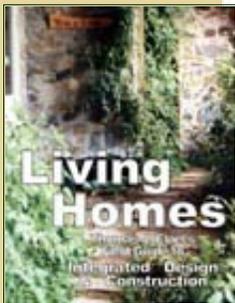
[Spiders Pick of The Day](#)(e-mail submission to boba@wwa.com)



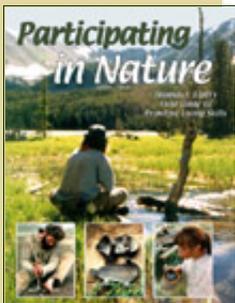
[Botany in a Day](#)



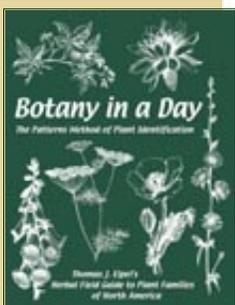
[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



[Botany in a Day](#)

[Starting Point](#)

[Submit It!](#)

[TSG Internet Classifieds](#)

info@tahoeangler.com

[Telvox Teleinformatics](#)

[Thomas Register](#)

[A Thousand Points of Sites](#)

[Too Cool](#)

[Tribal Voice Additions](#)

[Ultra Infoseek](#)

[UK Index](#)

centrifg@keytech.com

[Vancouver On The Net](#)

[Virtual Yellow Pages](#)

[Virtual Tourist \(server ann.\)](#)

[W3 Virtual Library x Subj.](#)

[The Wall](#)

[Webaholics](#)

[WebCrawler](#)

[WebDirect!](#)

[WebNexus](#)

[WebPost96 Lite](#)

[Web Search](#)

[Web Surf](#)

[What's New Too!](#)

[WinMag Netguide](#)

[WinMag HotSpots](#) (e-mail submission to

flanga@pipeline.com)

[Yahoo!](#)

[Yanoff's Internet Services List](#)

[Yell - UK Yellow Pages](#)

TheYellowPages.com

MonkeySweat.com

[Yellow Pages On Line](#)

[Search Engines for Finding People](#)

WhitePages.com

USsearch.com

[Yahoo! People Search](#)

Switchboard.com

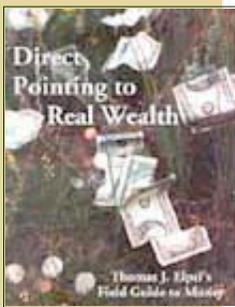
WhoWhere.com

USAfind.com

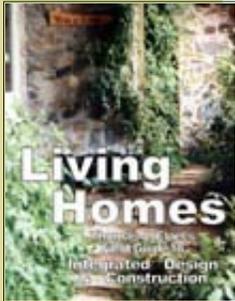
[INFORMER People Search](#)



How to Place Retail Orders



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

Anatomy & Morphology

4 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀



Album: Head

Changed: Oct 06, 2003.

Contains: 18 items.

Viewed: 1573 times.



Album: Thorax

Changed: Jan 07, 2004.

Contains: 9 items.

Viewed: 746 times.



Album: Abdomen

Changed: Sep 18, 2003.

Contains: 20 items.

Viewed: 943 times.



Album: Sting-related

Changed: Jul 28, 2003.

Contains: 11 items.

Viewed: 1159 times.

▷ 1 ◁

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗

Powered by [Gallery v1.3.3](#)

Head

18 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

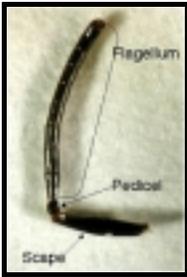
Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Anatomy & Morphology](#)

▶ 1 ◀ 2 ◦



Front view of a worker's head. Notice the hairs on top of the head, and also on the compound eyes.

Viewed: 626 times.



A worker antenna with parts annotated.

Viewed: 354 times.



Top view of the head showing the three ocelli, in a triangular formation.

Viewed: 436 times.



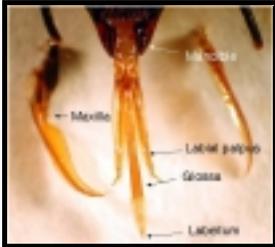
Two mandibles with the tongue in the middle.*

Viewed: 383 times.



Mandibles seeing from behind.
The tongue is in the retracted position.

Viewed: 313 times.



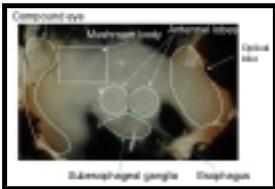
The mouthparts of a worker with annotation.

Viewed: 368 times.



[galea.jpg](#)

Viewed: 329 times.



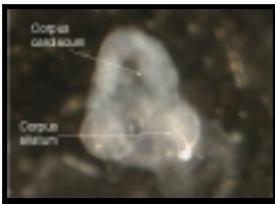
The dissected brain annotated. The optic lobes receive visual input from the two compound eyes. The center of the brain has a mushroom body on each side, where learning and memory occurs in insects. Olfactory inputs go to the antennal lobes. The esophagus (food canal) goes through the hole formed by the fusion of the subesophageal ganglia with the antennal lobes. The CC-CA complex is located here surrounding the esophagus.

Viewed: 365 times.



The mushroombody outlined. This is so called because it does look the cross section of the head of mushrooms.

Viewed: 220 times.



The CA-CC (corpora allata-corpora cardiaca) complex. The CC is usually milky colored, while the CA is round and clear (the photo here shows more white color due to lighting conditions). CA is the source of juvenile hormone, which regulates division of labor in adult workers. CC stores PTTH (prothoracicotropic hormone) and release it when needed, therefore called a neurohemal organ.

Viewed: 258 times.

* Comments available for this item.

▶ 1 ◀ <u>2</u> ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Anatomy & Morphology ↗		

Powered by [Gallery v1.3.3](#)

Thorax

9 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Anatomy & Morphology](#)

▶ 1 ◀



Closeup of hairs on the thorax of a worker bee. Notice that each hair is branched (plumose), enabling it to trap pollen grains more effectively.

Viewed: 285 times.



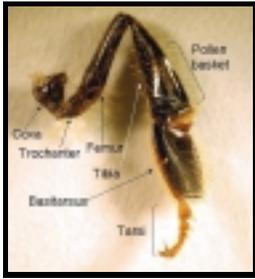
A worker with the top cuticle removed from the thorax to show the thoracic muscles. The middle two (looked like one but it is actually two) are the longitudinal muscles, which run from the head direction to abdomen direction. While the two near the wings are the vertical muscles.

Viewed: 272 times.



front_leg.jpg

Viewed: 216 times.



Hind leg of worker bee. The pollen basket is on the other side of the tibia (see next slide). Here you can see rows of thick bristles on the basitarsus.

Viewed: 225 times.



Pollen basket on the hind leg. The basket has long bristles (curved) on both sides, and there is also a single bristle in the middle.

Viewed: 237 times.



Rake (lower) and pollen press on the hind leg of a worker bee.

Viewed: 222 times.



Closeup of the tip of a leg, showing the two claws on the sides and a soft pad (arolium) in the middle. The claws allow workers to grab on rough surfaces, while the arolium works as a suction pad to hold on to smooth surfaces.

Viewed: 208 times.



Front wing (top) and hind wing (below). The two are synchronized together by a row of small hooks on hind wing and a fold on the rear edge of the front wing.

Viewed: 325 times.



Wing hooks (humuli) on the front edge of the hind wing and the fold of the front wing.*

Viewed: 241 times.

* Comments available for this item.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Anatomy & Morphology](#) ↗

Powered by [Gallery v1.3.3](#)

Abdomen

20 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Anatomy & Morphology](#)

▶ 1 ◀ 2 ◦



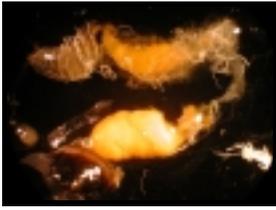
Workers around 6-12 days old can produce wax scales in their four pairs of wax glands. The glands are concealed between the inter-segmental membranes, but the wax scales produced can be seen, usually even with naked eyes. The scales are thin and quite clear. After workers chew them up and add saliva, it becomes more whitish.

Viewed: 292 times.



The digestive tract (intestine) of a worker bee, annotated.

Viewed: 226 times.



Part of the digestive tract of a worker bee. The crop is missing for this one, but the midgut is on the top, connected to the hindgut (bottom) by the small intestine. Notice the rectum is filled with pollen and is quite large. This special feature allows each worker to stay inside a hive for 3 months or longer during winter, without defecation. Healthy workers never defecate inside the hive, they go out during a warm day (>55 F) during Feb or March.

Viewed: 239 times.



Tracheal system (silver-looking networks) on the midgut of a worker. The tracheal tubes branch out smaller and smaller until they go into individual cells directly to deliver oxygen.

Viewed: 179 times.



The white dot near the end of the honey crop is the proventriculus. This device can function as a comb to remove pollen from nectar and also as a valve so no digested food even comes in contact with the nectar in the honey crop.

Viewed: 192 times.



The proventriculus was opened to show teeth like structure that can be used to remove pollen and perhaps also grind up them. In grasshopper and other insects this is even more heavily sclerotized for "chewing" the plant materials up.

Viewed: 206 times.



A ganglion from a worker abdomen, with the small globule like bodies (white) in the background. These are fatbodies, which function as a liver in bees, mainly for energy storage and detoxification.

Viewed: 203 times.



Two ganglia connected by the ventral nerve cord, which is actually two cords (one for each side), each abdomen would have one ganglia. Notice the abdomen muscle (used to control contraction and expansion of the abdomen), running diagonally.

Viewed: 194 times.



A worker, a drone, and a queen. All recently killed by freezing. The queen was laying eggs before sacrificed, as can be seen by her large abdomen.

Viewed: 281 times.



Queen head and worker head, head to head. Can you tell which one is the head of a queen? They are nearly identical in size. Hint: shape of mandibles are different.

Viewed: 239 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Anatomy & Morphology](#) ↗

Powered by [Gallery v1.3.3](#)

Sting-related

11 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Anatomy & Morphology](#)

▶ 1 ◀ 2 ◦



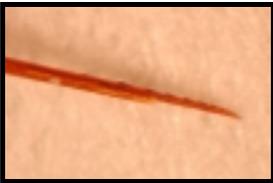
The exuded sting with a small drop of venom on it.

Viewed: 494 times.



The sting and its poison gland attached.

Viewed: 327 times.



Closeup of the sting showing the barbs, which allows the sting to anchor inside the victim's flesh, much like the barb on a fishing hook.

Viewed: 322 times.



The bee has just started the stinging process. This worker is rather weak, so the sting did not penetrate perpendicular to the skin surface and the sting is not deep.

Viewed: 358 times.



A worker bee trying to get away after stinging. The sting has barbs preventing the sting to be pulled out, part of her digestive system is seen dragging behind her.

Viewed: 424 times.



The sting is left behind and the bee is now free. The complex left behind (the sting, the venom gland, and muscles controlling the gland) will work autonomously to pump venom into the victim. Alarm pheromone is also released to "mark" the victim, so expect more bees to sting you if you have got one.

Viewed: 291 times.



A sting stays inside the flesh after the worker has left.

Viewed: 287 times.



The sting on the site.

Viewed: 270 times.



Two minutes after being stung.
The sting is removed to show
the site of sting entry.

Viewed: 270 times.



The site of a sting injury after
24 hours. Light red and
swelling is seen, a small scar
tissue is forming at the site of
sting entry.

Viewed: 316 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Anatomy & Morphology](#) ↗

Powered by [Gallery v1.3.3](#)

Bees on Flowers

11 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀ 2 ◦



Album: Bees Foraging

Honey bees foraging for nectar or pollen on flowers, or other materials.

Changed: Jan 04, 2004.

Contains: 88 items.

Viewed: 3356 times.



Album: Bees on Roses

All flowers here are cultivated roses (*Rosa* spp, Rosaceae). All photos were taken in the Beijing Botanic Garden, March 2002.

Changed: Dec 19, 2003.

Contains: 9 items.

Viewed: 749 times.



Album: Bees on Peonies

All flowers here are cultivated peonies or tree peonies (*Ponia* spp, Paeoniaceae). All photos were taken in the Beijing Botanic Garden, March 2002.

Changed: Jun 04, 2003.

Contains: 9 items.

Viewed: 662 times.



Album: Asian Bees (*A. cerana*)

Apis cerana is the sister species of our bees (*A. mellifera*). It is the original host of the varroa mites (*Varroa jacobsoni*, *Varroa destructor*). Bees are generally smaller and with more striking bands on the abdomen compared to our bees. Most photos taken in China, some in Thailand.

Changed: Sep 08, 2003.
Contains: 24 items.
Viewed: 1226 times.



Album: Giant Bees (*A. dorsata*)

Giant honey bees (*Apis dorsata*, *Apis laboriosa*) occur only in Asia (China, India, Malasia, Nepal, Thailand). They nest in tall trees or under rocks with a single piece of comb. Bees can forage at night with strong moonlight.

Changed: Nov 28, 2003.
Contains: 15 items.
Viewed: 1873 times.



Album: Dwarf Bees

Dwarf honey bees include *Apis florea* and *Apis andreniformis*. Both are about 1/4 of European honey bees and nest in the open with a single comb (about 1-1.5 ft long). *Florea* has the more reddish color while *andreniformis* is totally black in the abdomen when old. The two are so similar that they were considered to be one species until a few years ago.

Changed: May 31, 2003.

Contains: 4 items.

Viewed: 599 times.



Album: Stingless Bees

Changed: Jun 02, 2003.

Contains: 3 items.

Viewed: 631 times.



Album: Bumble Bees

Bumble bees (*Bombus* spp, Apidae) are in the same family as honey bees but have an annual cycle. Queens forage in the spring time, but once the first batch of workers emerge, she stays home to be full time mom. Workers are smaller and also sterile like honey bee workers. In the fall, the new queens mate, survive the winter and begin the cycle again next year.

Changed: Sep 18, 2003.

Contains: 15 items.

Viewed: 2191 times.



Album: Wasps + bees

Wasps and other bees that people often confuse with honey bees.

Changed: Dec 07, 2003.

Contains: 41 items.

Viewed: 5022 times.



Album: Bee-like Flies

Commonly called bee flies, flower flies, . These are syrphid flies in the family Syrphidae and often mimic honey bees or other bees. If you look closely, they have one pair of wings (instead of two) and very short antenna. They can also hover (hence also called hover flies) and fly backwards!

Changed: Aug 16, 2003.

Contains: 7 items.

Viewed: 687 times.

▶ 1 ◀ <u>2</u> °	▶▶	▶▶▶
------------------	----	-----

Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗
--

Powered by [Gallery v1.3.3](#)

Bees Foraging

88 items in this album on 9 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀ [2](#) ◦ [3](#) ◦ [4](#) ◦ [5](#) ◦ [6](#) ◦ [7](#) ◦ [8](#) ◦ [9](#) ◦



A European bee (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002.

Viewed: 649 times.



Three European bees (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002.

Viewed: 437 times.



A European bee (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002..

Viewed: 362 times.



A European bee (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002..

Viewed: 335 times.



A European bee (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002.

Viewed: 318 times.



A European bee (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002.

Viewed: 273 times.



A European bee (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002.

Viewed: 337 times.



Two European bees (*Apis mellifera*) foraging on hyacinth (*Hyacinthaceae*). Beijing, China. March 2002.

Viewed: 266 times.



A European bee (*Apis mellifera*) foraging on iris (*Iridaceae*). Beijing, China. March 2002.

Viewed: 336 times.



A European bee (*Apis mellifera*) foraging on iris (*Iridaceae*). Beijing, China. March 2002.

Viewed: 278 times.

▶ 1 ◀ [2](#) ◦ [3](#) ◦ [4](#) ◦ [5](#) ◦ [6](#) ◦ [7](#) ◦ [8](#) ◦ [9](#) ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

Powered by [Gallery v1.3.3](#)

Bees on Roses

9 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

▷ 1 ◁



All photos were taken April 2001, in the rose garden, Beijing Botanical Garden, China. *

Viewed: 327 times.



A bee on rose.

Viewed: 249 times.



A bee on rose.

Viewed: 262 times.



A bee on rose.

Viewed: 217 times.



Busy bees on roses.

Viewed: 234 times.



A bee on rose.

Viewed: 210 times.



A bee on rose.

Viewed: 231 times.



A bee foraging on a rose (*Rosa* spp, Rosaceae). MSU Tollgate Center. This was taken during a Lilly Teaching Fellow Retreat, Aug 17, 2002.

Viewed: 164 times.



A bee foraging on a rose (*Rosa* spp, Rosaceae). MSU Tollgate Center. This was taken during a Lilly Teaching Fellow Retreat, Aug 17, 2002.

Viewed: 204 times.

* Comments available for this item.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

Powered by [Gallery v1.3.3](#)

Bees on Peonies

9 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

▷ 1 ◁



This photo was published in the April issue of [Science](#) (296: 636), 2002. Credit was missing but appeared on 296:2336, 2002.

All the following photos were taken April 2001, in the Peony Garden, Beijing Botanical Garden, China.

Bees: *Apis mellifera*

Plants: *Paeonia* spp,
Paeoniaceae.

Viewed: 366 times.



Bees on a peony.

Viewed: 226 times.



Bees on a peony.

Viewed: 196 times.



Bees on a peony.
Viewed: 189 times.



Bees on a peony.
Viewed: 188 times.



Bees on a peony.
Viewed: 201 times.



Bees on a peony.
Viewed: 196 times.



Bees on a peony.
Viewed: 188 times.



Bees on a peony.

Viewed: 191 times.

▷ 1 ◁

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

Powered by [Gallery v1.3.3](#)

Asian Bees (A. cerana)

24 items in this album on 3 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀ 2 ◦ 3 ◦



A bee foraging on a begonia (Begoniaceae). Yunnan, China. May 2001.

Viewed: 327 times.



A bee foraging on a begonia (Begoniaceae). Yunnan, China. May 2001.

Viewed: 221 times.



A bee foraging on a dahlia flower (Dahlia spp, Asteraceae). Yunnan, China. May 2001.

Viewed: 232 times.



A bee foraging on Scarlet sage (Salvia splendens, Lamiaceae). Yunnan, China. May 2001.

Viewed: 221 times.



A bee foraging on Scarlet sage
(*Salvia splendens*, Lamiaceae).
Yunnan, China. May 2001.

Viewed: 187 times.



A bee foraging on prevet
(*Ligustrum* spp, Oleaceae).
Yunnan, China. May 2001.

Viewed: 221 times.



A bee foraging on day flowers
(Comelinaceae). This bee
was foraging before there was
full light (around 5 am).
Yunnan, China. May 2001.

Viewed: 236 times.



Three bees foraging on a
poppy (*Eschscholzia* spp,
Papaveraceae). Chiangmai,
Thailand. May 2000.

Viewed: 183 times.



A bee approaching an aster
(Asteraceae). Photo by
Wenquan Zhen.
Xishuangbanna, Yunnan,
China.

Viewed: 200 times.



A bee resting by biting on the anther of *Pichira macrocarpa* (Bombacaceae). Both *dorsata* and *cerana* forage on this plant by hovering and collect pollen. Hoving must be very tiring because you bees taking rests on leaves. This bee becomes smart and is taking a rest on the job. Xishuangbanna, Yunnan, China. April 2002.

Viewed: 287 times.

▶ 1 ◀ <u>2</u> ◦ <u>3</u> ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Bees on Flowers ↗		

Powered by [Gallery v1.3.3](#)

Giant Bees (*A. dorsata*)

15 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀ 2 ◦



Two giant honey bees foraging on a flower of dillenia (*Dillenia turbinata*, Dilleniaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 530 times.



A giant honey bee foraging on a megafruit pachira (*Pachira macrocapa*, Bombacaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 471 times.



A giant honey bee foraging on a megafruit pachira (*Pachira macrocapa*, Bombacaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 273 times.



A giant honey bee foraging on a megafruit pachira (*Pachira macrocarpa*, Bombacaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 300 times.



A giant honey bee foraging on a megafruit pachira (*Pachira macrocarpa*, Bombacaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 425 times.



A giant honey bee foraging on flowers of a Chinese holly tree (*Ilex rotunda*, Aquifoliaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 273 times.



A giant honey bee foraging on a water lily (*Nymphaea lotus*, Nymphaeaceae). I had to wait for about 20 min near this flower before a bee finally came. This is because I did not have a boat and most bees foraged near the middle of the lake.

Viewed: 284 times.



A giant honey bee foraging on flowers of a willow (*Salix* spp, Salicaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 272 times.



A giant honey bee foraging on flowers of a willow (*Salix* spp, Salicaceae). Xishuangbanna, Yunnan, China. April 2002.

Viewed: 270 times.



A giant honey bee foraging on flowers of a willow (*Salix* spp, Salicaceae). The camera was almost seeing the bee totally from the underside. Xishuangbanna, Yunnan, China. April 2002.

Viewed: 280 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

Powered by [Gallery v1.3.3](#)

Dwarf Bees

4 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀



An *Apis florea* worker foraging on Mexican heather (*Cuphea hysopifolia*, Lythraceae). This cultivated plant was popular in Yunnan and I have seen *dorsata*, *florea*, *mellifera* and *cerana* all foraging on the same plant!

Viewed: 310 times.



An *Apis florea* worker foraging on a mimosa (*Fabaceae*), which was planted in a vegetable garden near Jinghong. Again, we found *florea*, *cerana*, and *dorsata* all foraging on this plant at the same time (around noon, April 2002).

Viewed: 227 times.



An *Apis florea* worker foraging on a discarded watermelon. Yunnan, April 2002.

Viewed: 271 times.



Three dwarf honey bees (*Apis florea*) foraging on asters in a Thai flower market. After a bunch of bee scientists discussing the nest should not be far, we found a nest on a tree above the roof not far away. I also saw *Apis cerana* foraging on cabbage flowers but did not get a good shot. We failed to see any *dorsata* foraging in the market, but did see stingless bees also. Chiangmai, Thailand. March 23, 2000.

Viewed: 265 times.

Powered by [Gallery v1.3.3](#)

Stingless Bees

3 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀



A stingless bee (*Trigona* spp) foraging among the gladiolas (*Gladiolas* spp, Iridaceae) flowers. This was in a flower market! Chiangmai, Thailand. March 23, 2000.

Viewed: 241 times.



I am pretty sure that this one is a stingless bee (*Trigona* spp). She seems to be gathering resin from this flower of euphorbia (*Euphorbia milii*, Euphorbiaceae). Xishuangbanna Tropical Botanical Garden, Yunnan, China. April 2, 2002.

Viewed: 227 times.



A stingless bee coming to share a cookie with me. I must be VERY entomophilic (or all the bugs are zachophilic :) -- I have had so many different insects landing on me! or perhaps they just want to have their photo taken...Xishuangbanna, Yunnan, China. April 2, 2002.

Viewed: 206 times.

Bumble Bees

15 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀ 2 ◦



A bumble bee foraging on a five-finger, or sulphur cinquefoil (*Potentilla recta*, Rosaceae) near Boston, MA. Oct. 2002.

Viewed: 764 times.



A bumble bee (*Bombus impatiens*) on a thistle (*Asteraceae*). MSU garden. July 20, 2002.

Viewed: 406 times.



A bumble bee foraging on flowers. MSU garden. July 2002.

Viewed: 329 times.



A bumble bee (*Bombus* spp) foraging on the white pear-like flower (*Rosaceae*). Avignon, France. March 16, 2002.

Viewed: 358 times.



DSCN2872

Viewed: 298 times.



A bumble bee (*Bombus* spp, Apidae) foraging on a dahlia flower (*Dahlia* spp, Asteraceae). Kunming, Yunnan, China. May 2001.

Viewed: 392 times.



A bumble bee (*Bombus* spp, Apidae) foraging on a Caucasian inula (*Inula orientalis*, Asteraceae). MSU Beal Botanical Garden. July 22, 2003.

Viewed: 311 times.



A bumble bee (*Bombus* spp, Apidae) foraging on wild marjoram (*Organum vulgare*, Lamiaceae). MSU Beal Botanical Garden. July 22, 2003.

Viewed: 254 times.



A bumble bee (probably *Bombus affinis*, Apidae, identified by Gary Parsons) foraging on spotted knapweed (*Centaurea maculosa*, Asteraceae). Also called star thistle, it is a good nectar plant for bees, but the plant is considered an aggressive weed because it produces allelopathic chemicals to kill other nearby plants and creating a monoculture of itself. Beal Botanical Garden, MSU campus. August 7, 2003.

Viewed: 331 times.



A bumble bee on a watermelon (*Citrullus lanatus*, Cucurbitaceae) flower. August 7, 2003. MSU Beal Botanical Garden.

Viewed: 292 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

Powered by [Gallery v1.3.3](#)

Wasps + bees

41 items in this album on 5 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀ 2 ◦ 3 ◦ 4 ◦ 5 ◦



Bees or wasps?

From left to right: A yellowjacket, a European paperwasp, a honey bee, and a bumble bee queen.*

Viewed: 1185 times.



Someone left a broken frame out in Sept and bees and wasps are robbing honey from the comb. Amazingly there is some aggression, but not much between the wasps and bees, probably because this comb was outside a hive and it is fair game for both groups. Sept 11, 2002 (!).

Viewed: 590 times.



A solitary bee (most probably in the family Megachilidae) foraging on an aster. Zach's home garden, Michigan, USA.

Viewed: 454 times.



A yellowjacket (*Vespa* spp, Vespidae) foraging on mountain mint.

Viewed: 533 times.



A yellowjacket (*Vespula* spp) stealing honey from honey cells. Yellowjackets nest underground and can be very aggressive. Most people stung by 'bees' around picnic tables are actually stung by them. Michigan, USA.

Viewed: 595 times.



A yellowjacket (*Vespula* spp) stealing juice from an apple I was eating. Yellowjackets nest underground and can be very aggressive. Most people stung by 'bees' around picnic tables are actually stung by them. Michigan, USA. Oct 2002.

Viewed: 548 times.



A sweat bee (Halictidae, *Agapostemon* spp) foraging. Outside Butterfly House, Fort Lauderdale, FL. Nov. 2002

Viewed: 514 times.



A sweat bee (Halictidae, Agapostemon spp) foraging. Outside Butterfly House, Fort Lauderdale, FL. Nov. 2002

Viewed: 403 times.



A sweat bee (Halictidae, Agapostemon spp) foraging. Outside Butterfly House, Fort Lauderdale, FL. Nov. 2002

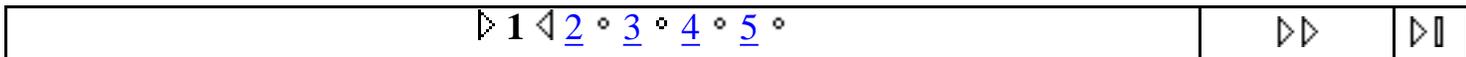
Viewed: 366 times.



A cuckoo wasp (Chrysura spp) foraging on mountain mint flowers. Zach's home garden, Michigan, USA.

Viewed: 519 times.

* Comments available for this item.



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

Powered by [Gallery v1.3.3](#)

Bee-like Flies

7 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees on Flowers](#) ↗

▷ 1 ◁



A syrphid fly on an aster (Asteraceae). Syrphid flies generally feed on aphids as adults, their larvae may also feed on aphids on plant leaves or live inside water. Look closely and you will see they have very short antenna (bees have longer ones), one pair of wings (bees have two pairs), and the wing venation of course is also totally different. Yunan, China. May 2001.

Viewed: 309 times.



This one probably mimics an *Apis cerana* (notice the much higher contrast for color between the abdomen segments), while the one before this one mimics *Apis mellifera*. Beijing, China. May 8, 2002.

Viewed: 189 times.



Another syrphid fly on a vegetable flower (Asteraceae) in a vegetable garden. Changsha, Hunan, China. May 5, 2002.

Viewed: 211 times.



A syrphid fly (this one does not really look like a bee, but hey it is pretty!) foraging on a mustard (Brassicaceae). This is a weed right in front of my parents' house. Shaoshan, Hunan, China. May 5, 2002.

Viewed: 221 times.



A syrphid fly (Syrphidae) foraging on summer raspberry (Rubus spp, Rosaceae). Symanzik's Berry Farm, Goodrich, MI. August 15, 2003, during a MSU Fruit Area of Extertise Summer Fruit Tour.

Viewed: 139 times.



A syrphid fly larva (Syrphidae) feeding on aphids, on a milkweed (*Asclepias syriaca*, Asclepiadaceae) leaf .
Symanzik's Berry Farm,
Goodrich, MI. August 15,
2003, during a MSU Fruit Area
of Extertise Summer Fruit
Tour.

Viewed: 120 times.



A syrphid fly (Syrphidae) foraging on the butterfly bush (*Buddleia davidii*, Logniaceae). These flowers were being sold by the Spicer Orchards, Hartland, MI.
August 14, 2003, during a
MSU Fruit Area of Extertise
Summer Fruit Tour.

Viewed: 162 times.

Flowers Without Bees

28 items in this album on 3 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees on Flowers](#)

▶ 1 ◀ 2 ◦ 3 ◦



Bird's-foot violet (*Viola pedata* L., *Violaceae*). Beal Botanical Garden, MSU. May 21, 2003.

Viewed: 196 times.



Bleeding hearts (*Dicentra* spp, *Papaveraceae*). Morning market, Avignon, France. March 15, 2002.

Viewed: 155 times.



Flowers of Highbush blueberry (*Vaccinium corymbosum*, *Ericaceae*). Beal Botanical Garden, MSU. May 21, 2003.

Viewed: 169 times.



Flowers of Highbush blueberry (*Vaccinium corymbosum*, *Ericaceae*). Beal Botanical Garden, MSU. May 21, 2003.

Viewed: 151 times.



Flowers of Highbush blueberry (*Vaccinium corymbosum*, Ericaceae). Beal Botanical Garden, MSU. May 21, 2003.

Viewed: 143 times.



Flowers of Highbush blueberry (*Vaccinium corymbosum*, Ericaceae). Beal Botanical Garden, MSU. May 21, 2003.

Viewed: 140 times.



Flowers of lowbush blueberry (*Vaccinium angustifolium*, Ericaceae). Beal Botanical Garden, MSU. May 21, 2003.

Viewed: 161 times.



Geraldton waxflower (*Chamelaucium uncinatum* Schauer, Myrtaceae). This is a bee plant -- I have seen bees foraging on it in San Diego, but did not get a good picture with bees on them. This photo was taken on the dinner table of Kellogg Biological Station, MSU while at a Lilly Teaching Fellow retreat. April 18, 2003.

Viewed: 177 times.



White flowers, something very similar to cherry or pear, so I say it must be a Prunus (Rosaceae). As a high bush, this was blooming everywhere in the country side in Avignon, South France. March 15, 2002.

Viewed: 151 times.



Pretty flower with a bug. MSU garden. July 20, 2002.

Viewed: 155 times.

▶ 1 ◀ <u>2</u> ◦ <u>3</u> ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Bees on Flowers ↗		

Powered by [Gallery v1.3.3](#)

Bees Near Entrance

15 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀ 2 ◦



A returning pollen forager in flight. September 2001. Zach's back yard.

Viewed: 654 times.



Two pollen foragers in flight, viewed from top. Notice the wings of the closest bee are in the lowest position, just beginning to be lifted upward.

Viewed: 520 times.



Pollen foragers returning home.

Viewed: 413 times.



Pollen foragers returning home.

Viewed: 381 times.



Two bees greet one incoming pollen forager near the entrance. The greeting can become unfriendly when the incoming bee smells different from other hivemates.

Viewed: 428 times.



A 'guard' bee (left) inspecting an incoming bee to see if she belongs to the family or not. Going into the wrong house may met with rejection and occasionally, death.

Viewed: 403 times.



The bee in the middle is being rejected by several workers. She probably got lost and came to the wrong hive! *

Viewed: 454 times.



Two bees lapping honey on a piece of white paper near the entrance.

Viewed: 131 times.



Two bees lapping honey on a piece of white paper near entrance.

Viewed: 454 times.



A worker and a drone side by side. The drone has his male reproductive organ exposed. This action also causes death to the poor drone! People squeeze the drones to cause this (sort of explosion), collect the semen, and use an instrument to transfer the semen to a virgin queen. The only insect that has artificial insemination!

Viewed: 478 times.

* Comments available for this item.

▶ 1 ◀ 2 ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗		

Powered by [Gallery v1.3.3](#)

Bees @ Home

5 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀



Album: European Bees

Whiteman's flies: *Apis mellifera*

Changed: Feb 27, 2004.

Contains: 7 items.

Viewed: 1783 times.



Album: Asian Bees

Asian hive bees: *Apis cerana*

Changed: Jun 27, 2003.

Contains: 14 items.

Viewed: 1053 times.



Album: Giant Bees

Giant honey bees: *Apis dorsata* + *laboriosa*

Changed: Aug 13, 2003.

Contains: 11 items.

Viewed: 1552 times.



Album: Dwarf Bees

Dwarf honey bees: *Apis florea*
+ *andreniformis*

Changed: Feb 04, 2004.

Contains: 13 items.

Viewed: 966 times.



Album: Wasps and others

Changed: Sep 06, 2003.

Contains: 20 items.

Viewed: 2095 times.

European Bees

7 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees @ Home](#)

▶ 1 ◀



A typical 'Italian' bee (*Apis mellifera ligustica*) busy making honey.*

Viewed: 588 times.



A black bee (perhaps *Apis mellifera carnica*) busy making honey.

Viewed: 463 times.



This is rather rare! One bee is feeding four others at the same time. Can you spot which is giving food? This picture was taken in South Africa, the bees were *Apis mellifera scutellata* (the so called killer bees).

Viewed: 526 times.



Bees on the entrance. This picture was taken in South Africa, the bees were *Apis mellifera scutellata* (the so called killer bees). They looked almost exactly like our gentler bees...

Viewed: 476 times.



Bees busy inspecting and nursing larvae. One bee was marked red on her thorax and tip of abdomen to know her age in an experiment.

Viewed: 472 times.



The queen rarely makes mistakes, but here she did it. An egg is shown here laid on top of a pollen cell.

Viewed: 383 times.



two-cappings.jpg

Viewed: 514 times.

* Comments available for this item.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees @ Home](#) ↗

Powered by [Gallery v1.3.3](#)

Asian Bees

14 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees @ Home](#)

▶ 1 ◀ 2 ◦



Mutual feeding (trophollaxis) between two *A. cerana* workers. The one on the right side is taking food from the left one.

Viewed: 347 times.



The worker in the center (blurred) is performing a 'cleaning dance' to elicit grooming behavior by other workers. Extensive grooming is considered one of the traits that *cerana* has to fight against *varroa* mites.

Viewed: 329 times.



The queen in the center is seeing laying eggs with workers surrounding her.

Viewed: 325 times.



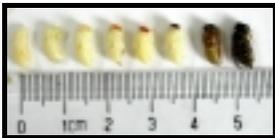
Three cerana workers feeding on honey.

Viewed: 273 times.



Another three gals.

Viewed: 266 times.



Various pupal stages of Apis cerana.

Viewed: 246 times.



Eggs of Apis cerana.

Viewed: 260 times.



Apis cerana larvae, about 2 days before being sealed. Unless you start with brand new foundation for Apis mellifera, you do not see beeswax this white for brood cells. In Apis cerana, they do not seem to recycle the wax for brood cells as much as our bees.

Viewed: 245 times.



Apis cerana workers on capped brood. A. cerana probably never reuses old wax for brood capping (as the mellifera do), since the brood capping is almost as clean as the honey capping.

Viewed: 254 times.



This pictures shows all the brood stages: eggs, young and old larvae, and capped cells. The glistening cells contain honey and one contain pollen. Can you find the pollen cell?

Viewed: 267 times.

Giant Bees

11 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees @ Home](#)

▶ 1 ◀ 2 ◦



A newly emerged *Apis dorsata* on my thumb. Just like all honey bees, newly emerged bees do not sting and cannot fly.

Viewed: 367 times.



Because the giant honey bees nest in the open, they have many more guard bees compared to *A. mellifera*, which just needs 20-100 guards near the entrance. Here you see guard bees around the areas of the nest that is in contact of the roof of the eaves.

Viewed: 385 times.



A giant honey bee nest on the eaves of a library (about 30 ft from ground). the nest is about 6 ft across. Someone has knocked a hole with a rock the day before, trying to steal some honey. Xishuangbanna, Yunnan, China. April 2002.

Viewed: 431 times.



A newly emerged *Apis dorsata* worker. Notice the small mite on the thorax -- this is the notorious 'lesser' mite (*Tropilelaeps clarae*), a large pest in China and other Asian countries on *Apis mellifera*. It jumped host from *dorsata* to *mellifera* there.

Viewed: 369 times.



A drone of *Apis dorsata* emerging from his cell. Unlike in our bees, where the drone cell is much larger than worker's, in this bee there is no difference between the two! Xishuangbanna, Yunnan, China. April 10, 2002.

Viewed: 315 times.



A silk-cotton tree (*Bombax ceiba*, *Bombacaceae*) with about 40-50 nests of giant honey bees. Xishuangbanna, Yunnan, China. April 2002.

Viewed: 382 times.



A closeup of an old giant honey bee (*Apis dorsata*). While their body has similar diameters as mellifera (the average worker cell size is 5.4 mm across), they body is longer and wings has a smoky looking. Bands on abdomen gets darker as workers age.

Viewed: 431 times.



dorsata-newbee

Viewed: 297 times.



It seems that as the workers get larger, the difference in size between workers and drones gets smaller. Here you see the drone (top) is only 1 mm longer than the worker, in *Apis dorsata* (the giant honey bee). There is also no cell size differences between worker and drone cells!
In the dwarf honey bees (*A. florea* and *andreniformis*), the difference between the two is the largest, both in terms of body size and cell size.

Viewed: 330 times.



Change in appearances in Apis dorsata worker, from pupa to adult.

Viewed: 375 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees @ Home](#) ↗

Powered by [Gallery v1.3.3](#)

Dwarf Bees

13 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees @ Home](#)

▶ 1 ◀ 2 ◦



Trick photo! This is a newly emerged dorsata worker on a florea nest. The dorsata was dipped in honey before introduced so workers were licking her, making her looking like a queen! The next day the worker was still in the nest, seemly being accepted by their much smaller cousins.*

Viewed: 428 times.



The queen and her retinue of a florea colony. Note the bee with '77' on her, which I tagged the night before. Because workers form a few layers of curtains, one has to comb through them to find the queen. This one took us about 20 min to find and I just got lucky to have this clear shot, because two seconds later she disappeared again. Both florea and dorsata queens can fly without any preparation. European and Asian honey bee queens would need to be starved for 2-3 days before they can fly because they are too fat when laying eggs.

Viewed: 409 times.



A closeup of workers on a florea nest. Workers form curtains (shingled together) similar to the giant honey bees.

Viewed: 286 times.



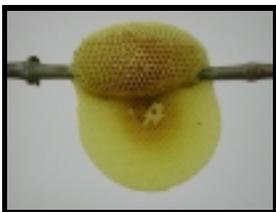
A mature florea nest, about 1 ft across. Honey is stored in a rather cylindric column near the top. Worker brood is solid in the center, separated by a few rows of pollen cells from the much larger drone cells on the outer rim. Notice there are two queen cells hanging down.

Viewed: 339 times.



The same nest held by Zachary. Photo by Darong Yang.

Viewed: 262 times.



A relatively new nest of florea. Some people harvested this colony's old comb about 2 weeks ago, and found their new nest again, this time only about 6 inches across. Brood in the center are only just beginning to be sealed.

Viewed: 298 times.



A closeup of a florea comb. A few rows of pollen are between the brood area and honey below. The honey storage is probably temporary -- the large cells are drone cells and will be used for rearing drones.

Viewed: 302 times.



The same nest, showing the top. The honey storing area wraps around the twig, giving it a lot of strength. Notice the cell orientations have to change all the time to accomplish this.

Viewed: 259 times.



A florea worker trying to sting my finger. The pain is much less compared to the European bees. Most of the time they have trouble getting through my thick skin.

Viewed: 294 times.



An *Apis andreniformis* worker on my fingers. Notice she is totally black, not reddish as *Apis florea*.

Viewed: 300 times.

* Comments available for this item.

▶ 1 ◀ <u>2</u> ◦	▶▶	▶
------------------	----	---

Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Bees @ Home ↗

Powered by [Gallery v1.3.3](#)

Wasps and others

20 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bees @ Home](#)

▶ 1 ◀ 2 ◦



Entrance to a yellowjacket nest. This nest was in my garden, probably from a abandoned ground hog hole. They only showed some agression when we mowed near the nest. Okemos, MI. August 24, 2002.

Viewed: 356 times.



Entrance to a yellow jacket nest, in a pile of twigs just behind my house.

Viewed: 371 times.



The nest of the yellowjackets shown in the previous picture. This is Nov. 23, 2001 and nearly all workers are dead due to the temperature. Only mated queens survive winter and start new nests the next year.

Viewed: 413 times.



Starting up a new nest by a queen *Polistes dominulus*. New nests are usually started May-June. This picture was taken on June 8, 2002.

Viewed: 368 times.



A nest of European paper wasps (*Polistes dominulus*). This is an invasive species in Michigan. It has become much more common than the grey paper wasp (*P. fuscatus*), which is not as aggressive. MSU apiary, USA. August 20, 2001.

Viewed: 418 times.



A very young nest of the baldfaced hornet (*Dolichovespula maculata*). Can be very aggressive but prey on other insects for a living. Michigan, USA.

Viewed: 375 times.



The European paper wasps (*Polistes dominulus*, Vespidae) will nest anywhere they please. Here they are nesting inside a horizontal metal pipe (diameter about 3 inches). MSU apiary, USA. August 5, 2002.

Viewed: 435 times.



A nest of *Polistes dominulus* (European paper wasp) underneath the wax melter. The surface it attached to was metal.

Viewed: 365 times.



A bee on my palm. I am not sure what kind of bee it is (next time I have to sacrifice all the nice bugs to science! Must collect specimens to have correct identification, I was told, photos are not good enough). Xishuangbanna, Yunnan, China. April 7, 2002.

Viewed: 340 times.



Defecation (droppings)
underneath the nesting hole of
a carpenter bee (*Xylocopa* spp,
Apidae). Photo and
copyrighted by Chris Earley.
July 23, 2003.

Viewed: 301 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bees @ Home](#) ↗

Powered by [Gallery v1.3.3](#)

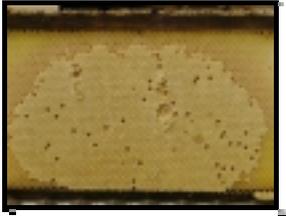
Disease & Pests

12 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀ 2 ◦



Album: Brood patterns

Changed: Dec 07, 2003.

Contains: 4 items.

Viewed: 267 times.



Album: Varroa mites

Changed: Dec 08, 2003.

Contains: 14 items.

Viewed: 578 times.



Album: American Foulbrood

American Foulbrood disease is perhaps one right next to Varroa as the 2nd worst pest/disease on European honey bees. Photographed and copyrighted by Prof. M.V. Smith, University of Guelph.

Changed: Dec 07, 2003.

Contains: 8 items.

Viewed: 246 times.



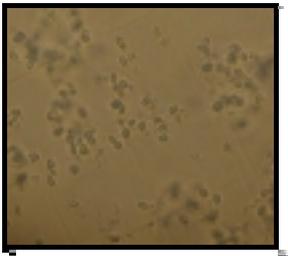
Album: European Foulbrood

European Foulbrood photos, all photographed and copyrighted by Prof. M.V. Smith, University of Guelph.

Changed: Dec 07, 2003.

Contains: 3 items.

Viewed: 155 times.

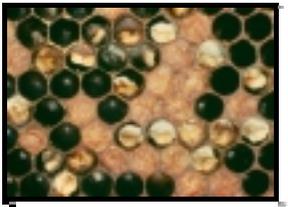


Album: Nosema disease
nosema disease

Changed: Dec 07, 2003.

Contains: 1 item.

Viewed: 198 times.



Album: Chalkbrood disease
Chalkbrood disease

Changed: Dec 07, 2003.

Contains: 4 items.

Viewed: 139 times.



Album: Wax Moths

Wax moths: the greater and the lesser wax moth.

Changed: Dec 08, 2003.

Contains: 6 items.

Viewed: 204 times.



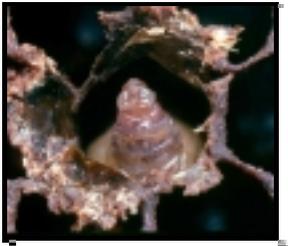
Album: Tracheal mites

Tracheal mites

Changed: Dec 07, 2003.

Contains: 2 items.

Viewed: 182 times.



Album: Sacbrood disease

Sacbrood disease

Changed: Dec 07, 2003.

Contains: 5 items.

Viewed: 123 times.



Album: Laying workers

Changed: Nov 06, 2003.

Contains: 3 items.

Viewed: 149 times.

▶ 1 ◀ <u>2</u> °	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗		

Powered by [Gallery v1.3.3](#)

Brood patterns

4 items in this album

[\[slideshow\]](#) [\[login\]](#)

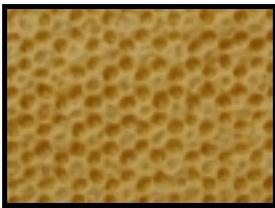
Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▶ 1 ◀



A healthy colony, with a young queen, should produce brood like this. While the brood is healthy. There are something usual about the pattern of capping. Have you seen anything different? Next photo explains why.

Viewed: 394 times.



Well, this capping is not 'normal' or 'usual'. Notice the rosette pattern? one normal looking brood cell was surrounded by six sunken cells. Normal brood should all look like the center cell. After seeing this in my observation colony, I was betting with my lab members that there were probably no brood in these sunken cells. I was wrong! there were normal worker pupae in all cells. Genetic? when the colony swarmed, I harvested it and the same queen produced similar pattern in the new colony! I should have saved a frame in the freezer and could have published another paper...Prof. Randall Hepburn (South

Africa) has written a book on wax of bees and showed many strange patterns but he has not seen this type either. He did see rosette patterns before, but usually the center cell is a 'false' cell (no larva). Here all cells have larvae. MSU observation hive, May 3, 2000. Note, I have discovered (on June 3rd, 2003, three years and one month later...) another queen is doing this again, in the same observation hive! We will try to 'study' what causes these wierd cappings to occur.-- Zachary Huang

Viewed: 606 times.



Brood of *Apis mellifera* uncapped by workers. Pupae seem to develop normally within these uncapped cells. The significance of this is not clear. Some think bees maybe uncapping the cells when they detect varroa mites there. It is true also in *Apis cerana* this phenomenon is more common, where varroa is not a problem. MSU apiary. July 17, 2002.

Viewed: 315 times.



A frame of brood that is not so healthy. The white stuff in cells are chalkbrood mummies. This colony is probably infected with chalkbrood, possibly also brood disease (AFB or EFB), and perhaps also varroa mites. When varroa mite infection is severe, it often causes frames like this, which is called bee PMS (parasitic mite syndrome). Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 121 times.

Varroa mites

14 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Disease & Pests](#)

▶ 1 ◀ 2 ◦



Varroa mites (Varroa destructor) on a drone pupa that was removed from its cell.

Viewed: 515 times.



No, this is NOT a staged picture! Last October some colonies were dying and being robbed. On close inspection they were having very severe cases of PMS (parasitic mite syndrome). Very few brood cells were left and when I opened these cells, some had more than 20 mites per cell! This one had like 12 mites just near the top. Most of the time the larvae were already dead inside cells (this one looks alive). MSU apiary. Oct 14, 2002.

Viewed: 556 times.



Another larva with 5 varroa mites on one side, I am sure a few ran away... You can tell that the larva was dead by its abnormal coloration. MSU apiary. Oct 14, 2002.

Viewed: 440 times.



A varroa mite (*Varroa destructor*) and a "lesser mite" (as is called in China), *Tropilaelaps clarae*, side by side. *Tropilaelaps* jumped host from *A. dorsata* to *A. mellifera* in Asia. Hopefully it will never make its way to North America because in southern China it is sometimes more serious than varroa.

Viewed: 441 times.



A varroa mite (*Varroa destructor*) on the back of a worker bee. The bee on the bottom has her wings unexpanded -- a sign of varroa damage during her pupal stage.

Viewed: 410 times.



Varroa mites (*Varroa destructor*) floating in alcohol under a dissecting scope.

Viewed: 406 times.



Stages of varroa (Varroa destructor) mites. Younger ones on left, all white mites will die when a bee emerges out. The 2nd one from right would be able to live. Her cuticle will become redder after 2-3 more days of hardening. Beijing China. May 15, 2001.*

Viewed: 402 times.



A varroa mite (Varroa destructor) on the back of a worker bee (the one in the center).

Viewed: 358 times.



Various stages of mites. The two rounder mites on the lower right are males. They never become red like the female and die soon after a worker or drone cell is open, perhaps due to dehydration. May 15, 2001.

Viewed: 342 times.



The white defecation of a varroa mother mite on a worker pupae (near the tip of abdomen). This is usually a sign that the mite did not reproduce. Reproducing mites defecate on cell walls, not on the developing bee.

Viewed: 422 times.

* Comments available for this item.



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Disease & Pests](#) ↗

Powered by [Gallery v1.3.3](#)

American Foulbrood

8 items in this album

[\[slideshow\]](#) [\[login\]](#)

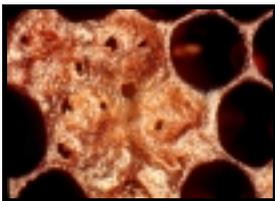
Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▶ 1 ◀



Spotty brood usually means the queen is old or there is brood disease. Sunken brood capping with holes suggest most likely American Foulbrood, which can be a serious disease if left to develop. In most states, the bacteria causing this disease (*Paenibacillus larvae*) has become resistant to oxytetracycline (Terramycin). New medications (lincomycin and tylosin) are being applied for bee use. Photo by Zachary Huang.

Viewed: 344 times.



On close inspection, AFB killed capped brood would have many small holes on the cap. The cappings are also "sunken" and not perfectly flat as normal healthy cappings.

Viewed: 99 times.



A late stage larva killed by AFB. The larva has been capped, becomes standing (instead of coiled flat on the cell bottom), then died. This is in contrast with EFB infected larvae which usually die at the coiled stage.

Viewed: 91 times.



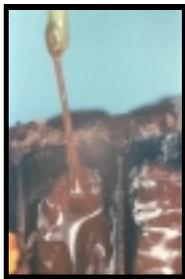
A dead larva killed by AFB usually forms a "false tongue", with tongue pointing upward.

Viewed: 91 times.



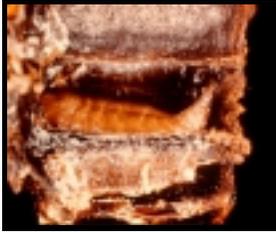
The false tongue viewed normally from the cell opening.

Viewed: 84 times.



The goo left by AFB killed larva can be drawn to form a "rope". This is commonly called a ropiness test. EFB killed larva does not form rope easily.

Viewed: 91 times.



The dead larva now dehydrates, soon will become a "scale" which is completely dried, difficult for bees to remove, and contains millions of spores which remain infective for many years (up to a decade).

Viewed: 92 times.



Fire is still the best way to control AFB. In New Zealand where any colony with visible AFB symptoms is burned, the recurring rate is about 2% colonies each year. When burning, dig a hole about 1-2 ft deep (depending the # of hives), put hives in, douse with gasoline or BBQ light fluid, start fire, then cover with at least 6 inches of dirt. Check with you state law before doing so, because open burning is banned in many states.

Viewed: 91 times.

European Foulbrood

3 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) [🏠](#) Album: [Disease & Pests](#) [🏠](#)

▶ 1 ◀



Larvae showing typical European foulbrood (EFB) symptoms. These larvae die earlier than those of AFB, while the larvae are still coiled (AFB larvae die in straight, upright position.) and show yellow streaks first which then turn brown. Caused by a bacterium *Melissococcus pluton* (formerly *Streptococcus pluton*). Photo by M.V. Smith, University of Guelph.

Viewed: 90 times.



Photo showing larvae infected with European foulbrood, when removed from the cells. Caused by a bacterium *Melissococcus pluton* (formerly *Streptococcus pluton*). Photo by M.V. Smith, University of Guelph.

Viewed: 79 times.



"Scale" formed by a dead larva which was killed by EFB. Dead larva killed by EFB usually does not form a "rope" when stirred and then drawn with a small stick (toothpick or match stick). Photo by M.V. Smith, University of Guelph.

Viewed: 73 times.

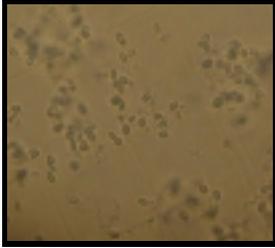
Nosema disease

1 photo in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▷ 1 ◁



Spore stage of *Nosema apis*, the protozoan that causes Nosema disease in honey bees. Magnified about 400 times, on a hemocytometer which has small squares to quantify the spores. Photo by Yuchuan Qin. 2003, MSU.

Viewed: 86 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Disease & Pests](#) ↗

Powered by [Gallery v1.3.3](#)

Chalkbrood disease

4 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▷ 1 ◁



Chalkbrood, whereby the larvae becomes mouldy with white hyphae (vegetative body of fungi), then hardened to be similar to pieces of white chalk (hence the name). Caused by a fungus (*Ascosphaera apis*), this disease is mostly considered a "stress" disease, only occurring in weak, or in otherwise stressed colonies (pesticide kill, not enough workers, sudden cold spell in spring etc). The spores are ubiquitous but can only germinate in larvae when the core brood temperature is 2-3 degrees below normal (35 C or 95 F). There is no chemical treatment. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 82 times.



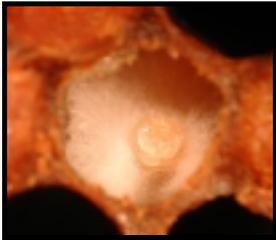
Chalkbrood mummies removed from cells. The two on the top are producing spores, while the three below are at a slightly earlier stage. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 65 times.



Chalkbrood mummies removed from cells. The mummies in the top row are producing many spores, which make the mummie totally black. This stage is now contagious. The mummies in the bottom row are not producing spores yet and if workers remove them now, the reinfection cycle is broken. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 68 times.



DSCN4808.JPG

Viewed: 44 times.

▷ 1 ◁

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Disease & Pests](#) ↗

Powered by [Gallery v1.3.3](#)

Wax Moths

6 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▶ 1 ◀



The greater wax moth (*Galleria mellonella*) larvae, shown with various instars. Photo by former graduate student Anne Hanley.

Viewed: 178 times.



Closeup view of the emptied cocoons from where the adult moths have emerged. Photo by Prof. Zachary Huang, Michigan State University.

Viewed: 174 times.



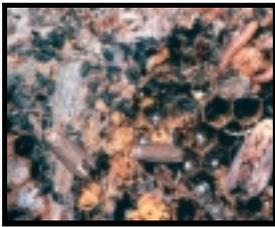
A comb severely infected with the greater waxmoth. The white ones are the cocoons spun by mature larvae just before they pupate. Silk and frass are everywhere making this frame not usable for extraction of honey if this were a honey frame. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 81 times.



Just before the wax moth larvae spun their cocoons, they use the mandibles to chew an indentation on wood so that the cocoon would attach better. Notice the dead workers near the lower left of the photo. Workers often die inside cells because they cannot get out due to the silk left by small wax moth larvae when tunnelling beneath the workers. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 73 times.



The lesser wax moth (*Achroia grisella*, Pyralidae), causing similar damage to the greater wax moth but is not as common in Michigan. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 78 times.



DSCN4803.JPG

Viewed: 51 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Disease & Pests](#) ↗

Powered by [Gallery v1.3.3](#)

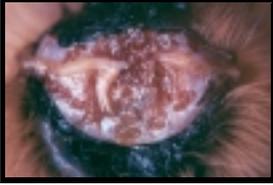
Tracheal mites

2 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▶ 1 ◀



A cross section of the thorax of a worker, showing the main thoracic trachea of each side. Trachea from healthy workers should be white with a silvery reflection. The ones here are infected with tracheal mites (*Acarapis woodi*) and has become brownish or black due to the scar tissue from mite feeding and the presece of many mites. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 99 times.



Two tracheal mites (*Acarapis woodi*) inside a worker trachea. Too many mites in there obviously blocks the airway of workers and workers become physically weaker and cannot fly as far and die earlier compared to healthy bees. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 97 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Disease & Pests](#) ↗

Powered by [Gallery v1.3.3](#)

Sacbrood disease

5 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▶ 1 ◀



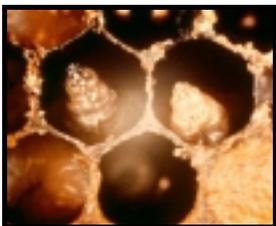
Sacbrood is caused by a bee virus (*Morator aetotulas*). Larvae die right before or shortly after the cells are capped. Here is a dead larva right before the cell is fully capped. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 58 times.



A closeup of the head of sacbrood virus killed larva. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 62 times.



The heads of larvae killed by sacbrood virus, with the cell capping removed. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 60 times.



The sacbrood killed larva (actually a prepupa) removed from the cell. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 56 times.



Side view of dead larva killed by sacbrood virus. Notice the discoloration and hardening of cuticles near the head. Photo by Prof. M.V. Smith, University of Guelph.

Viewed: 69 times.

Laying workers

3 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) [🏠](#) Album: [Disease & Pests](#) [🏠](#)

▶ 1 ◀



On a side view you can see better these cells (even though they are worker-sized) are capped as drone cells. One closest to the camera seems to be capped as a worker though, and this is intriguing. May 30, 2003.

Viewed: 209 times.



A laying worker colony. When a colony beomes 'hopelessly queenless', workers will eventually develop their ovaries (without the inhibition from the open brood and queen pheromone) and lay eggs. The eggs are all unfertilized so all develop into drones. Such colonies are usually doomed unless a miracle happens (about 1% of time some unfertilized eggs will become diploid through a process called thyletoky, but this process is very common in the cape bees, *Apis mellifera capensis*). May 30, 2003.

Viewed: 222 times.



Many drones are reared in worker cells, making them small drones. Here you see a drone in the center which is about the same length of a worker next to him. May 30, 2003.

Viewed: 206 times.

Other pests

9 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▶ 1 ◀



Typical damage done by bears. Contrary to popular misconception, bears go for the brood as protein source, although they do eat honey, but more as a side dish.

Viewed: 50 times.



Bee louse is actually a wingless fly (*Braula coeca*, Braulidae, Diptera), not a louse. Not very common to find.

Viewed: 58 times.



A preying mantis taking its meal. Foragers become meals of other animals (birds, spiders and other insects) quite often.

Viewed: 58 times.



A worker infected with paralysis virus, showing the typical K-wing symptom. Photo and copyrighted by Prof. M.V. Smith, University of Guelph.

Viewed: 63 times.



Skunks prey on honey bees near the entrance after dark. They usually roll the bees on soil to get rid of their stingers (perhaps by getting stung on paws are better than stung inside the mouth). One can use a board with nail-tips pointing outward to discourage skunks. Photo and copyrighted by Prof. M.V. Smith, University of Guelph.

Viewed: 58 times.



A hive skeleton left at the mercy of termites. Photo and copyrighted by Prof. M.V. Smith, University of Guelph.

Viewed: 55 times.



Tiny ants attacking an *Apis dorsata* pupa. Yunnan, China. April 7, 2002.

Viewed: 213 times.



One colony was dead and we found a mother mouse with 5 babies on the bottom board. She ran away, dropping the babies everywhere. I became too softhearted (to a bee pest!) and carefully picked each one, putting them back into the nest, hoping the mother would return. She did return and would run away each time I checked (although the babies got bigger and attached to her quite tightly in later times) but always returned. April 26, 2003.

Viewed: 197 times.



The mice are now big! almost ready to be weaned. They did disappear totally from the empty bee hive when I checked again around mid May. MSU apiary. May 5, 2003.

Viewed: 205 times.

Small hive beetle

1 photo in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Disease & Pests](#) 

▷ 1 ◁



A larva of the small hive beetle (*Aethina tumida*, Nitidulidae). Larvae cause damage by destroying combs and making honey un-usable. This is a new pest recently introduced from Africa (first reported in Florida in 1998). It has been repeatedly introduced into Michigan the last few years from Georgia or Florida, but has not been widely established here yet.

Viewed: 166 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Disease & Pests](#) ↗

Powered by [Gallery v1.3.3](#)

Beekeeping

11 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀ 2 ◦



Album: Apiary Scenes

Changed: Aug 21, 2003.

Contains: 9 items.

Viewed: 1130 times.



Album: Beekeeping Equipment

Changed: Nov 14, 2003.

Contains: 18 items.

Viewed: 1330 times.



Album: Package installation

Changed: Jun 01, 2003.

Contains: 13 items.

Viewed: 671 times.



Album: Swarm-Catching (Easy)

Changed: May 27, 2003.

Contains: 13 items.

Viewed: 887 times.



**Album: Swarm-Catching
(Hard)**

Changed: May 27, 2003.

Contains: 15 items.

Viewed: 738 times.



**Album: Swarm-Catching
(Impossible)**

Changed: May 27, 2003.

Contains: 5 items.

Viewed: 504 times.

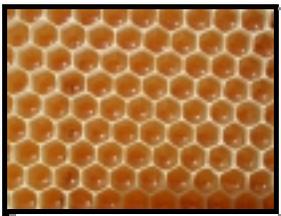


Album: Bee Removal

Changed: Feb 24, 2004.

Contains: 13 items.

Viewed: 2281 times.



Album: Honey Harvest

Changed: May 30, 2003.

Contains: 3 items.

Viewed: 715 times.



Album: Observation Hive
Installation of an observation
hive.

Changed: Sep 26, 2003.
Contains: 14 items.
Viewed: 892 times.



Album: Moving Bees

Changed: Jun 04, 2003.
Contains: 5 items.
Viewed: 564 times.

▶ 1 ◀ <u>2</u> °	▶▶	▶
------------------	----	---

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗

Powered by [Gallery v1.3.3](#)

Apiary Scenes

9 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀



University of Guelph apiary, behind the bee lab. This photo was taken around 1987-1988 (during my time as a Ph.D. student under the supervision of Dr. Gard Otis), during the fall.

Viewed: 339 times.



An apiary of *Apis mellifera* near the rubber tree forests in Yunnan, China. Rubber trees have extra-floral nectaries and can produce high yield (but considered so so quality) honey. The owner tells me he sells only about 400 yuan (\$50 US) per ton of honey. March 28, 2002. Xishuangbanna, Yunnan, China.

Viewed: 554 times.



Streetside beekeeping.
Migrating beekeepers have their bees, a portable wooden house, in Beijing, right on the road side. I was told that they were move north soon so here is more like a rest stop.
Beijing, China. June 7, 2001.

Viewed: 460 times.



There were about 6-7 different bee-houses each representing a family (usually a couple) in a small stretch of road near the outskirts of Beijing. Beijing, China. June 7, 2001.

Viewed: 412 times.



A high security bee yard in South Africa. Apparently bee colonies get stolen quite often there, requiring this for theft prevention. South Africa. Oct 31, 2001.

Viewed: 432 times.



Apis cerana kept in fixed wooden boxes. These were then left in the balcony of a government office building and apartment. In the far background you can see a similar hive on a stand. Out of the 2 million colonies of Apis cerana in China, some are still kept this way, in hives with non-movable frames. Yunnan, China. May, 2001.

Viewed: 374 times.



Front yard beehkeeping of Apis cerana colonies. This is at Puwa, a place about 100 km from Beijing. With very tough terrain, it took us about 4 hours to travel there from Beijing. We were there to look for varroa mites (nothing) and to buy two colonies for research. May 12, 2001.

Viewed: 351 times.



Colonies of the now famous Russian bees (imported from Russia to fight against the varroa mites) at the Baton Rouge USDA bee lab apiary. May, 1999.

Viewed: 344 times.



Small experimental colonies at the Baton Rouge USDA bee lab apiary. May, 1999.

Viewed: 308 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Beekeeping](#) ↗

Powered by [Gallery v1.3.3](#)

Beekeeping Equipment

18 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀ 2 ◦



A solar wax melter to melt old wax from old combs. *

Viewed: 350 times.



An electrically heated knife is used to remove the honey cappings here. Bees cap honey when the honey is "mature" (moisture < 18%). The cappings must be removed before honey can be spun out by centrifugal force.

Viewed: 304 times.



A electrically powered, radial extractor. Frames are put into the extractor radially and honey flies out from both sides of the frame.

Viewed: 304 times.



Pre-cut wood pieces for a hivebody. These must be assembled by the user, painted, and then used over a colony. They can either be used as a "broodbox" (for brood rearing), or for "honey super" (for storing honey that is to be harvested).

Viewed: 246 times.



Erick Forster, then (June 2000) an undergraduate student working on a honey bee research project, assembling a hivebody.

Viewed: 246 times.



Water feeder near the hive entrance. This is a good idea if you have neighbors who have swimming pools! Beijing, China. August 19, 2000.

Viewed: 283 times.



honey-house

Viewed: 267 times.



jentor-frame

Viewed: 244 times.



jentor-sys

Viewed: 236 times.



queenbank6

Viewed: 260 times.

* Comments available for this item.

▶ 1 ◀ 2 ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Beekeeping ↗		

Powered by [Gallery v1.3.3](#)

Package installation

13 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Beekeeping](#)

▶ 1 ◀ 2 ◦



I was asked to show and tell package installation to some cub scouts. May 5th, 2003, MSU apiary. All Photos by Thomas Valli (except two), the den leader.

Viewed: 238 times.



The first step is to spray some light sugar water to the bees to calm them down. When they are wet and heavy, they do not fly as much.

Viewed: 218 times.



A bit of lecturing.

Viewed: 184 times.



Cracking open the cover.

Viewed: 197 times.



Check that the queen is alive (can you find her?). Then remove the metal plate (facing my hand), exposing the hole through which the bees can chew out (through the candy) and release the queen. Some people push a nail through the candy in this hole to accelerate the chewing through, others leave it alone. The hole away from my hand was plugged by a cork. Put this cage between two frames, leaving the sugar side up -- this way dead workers inside will not block the hole, which is facing up. Photo by Zachary Huang.

Viewed: 253 times.



Place the queen cage (again, candy side up, with the hole unplugged) between two frames, with screen not facing the frames so bees in the colony can transfer the queen pheromone out through the screen. This picture was taken in another package colony (with older frames). Photo by Zachary Huang

Viewed: 215 times.



Now the hard part: removing the can (which holds sugar syrup) out. Sometimes this is difficult because bees may build some wax around it. By keeping the can flat, or even a bit upsidedown, as shown here, makes it easier to get it out.

Viewed: 199 times.



The can is out!

Viewed: 205 times.



Gave it a good shake and the bees should all come out...then they magically 'flowing' down between the frames. Very few bees would fly if you have sprayed enough.

Viewed: 228 times.



The package cage is almost empty now.

Viewed: 224 times.

Powered by [Gallery v1.3.3](#)

Swarm-Catching (Easy)

13 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀ 2 ◦



Swarm discovered: 9:19am,
6/13/2002. At the MSU apiary
near the Lake.

Viewed: 290 times.



A closeup of the swarm.

Viewed: 381 times.



9:20:49 am, the swarm before
being hived.

Viewed: 290 times.



9:21 am, Sandie Michalek, my
beekeeping technician, starts
putting a hive box directly
below the swarm.

Viewed: 252 times.



9:21am, this includes a hive stand, a bottom board, and a brood box with 10 frames.

Viewed: 225 times.



9:22 am, she tried to cut the branch off, thinking that would be easier. But gave up because it was too thick to cut.

Viewed: 240 times.



DSCN9852

Viewed: 231 times.



DSCN9853

Viewed: 214 times.



9:22:49 am, She shook the
brank to let the swarm fall
directly into the box.

Viewed: 267 times.



9:22:55 am, Most of the bees
are now inside the hive box.
Bees usually "flow" into the
spaces between the frames
when shaken down.

Viewed: 286 times.

▶ 1 ◀ 2 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Beekeeping](#) ↗

Powered by [Gallery v1.3.3](#)

Swarm-Catching (Hard)

15 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀ 2 ◦



Time is 11:52:24 am, June 21, 2000. 'Actors': Prof. Fred Dyer, Joeg Schmidt-Bailey, Micah Gill, and Dina Grayson, all of Michigan State University. At MSU apiary. Photographed by Zachary Huang.

Viewed: 219 times.



A closeup of the swarm.

Viewed: 228 times.



The swarm is pretty high (~10 ft off the ground), on a cedar tree.

Viewed: 210 times.



11:53:09 am, Micah tries to cut the branch, but the swarm is clustered on the main trunk of the tree.

Viewed: 206 times.



11:58:53 am, Prof. Dyer sprays some sugar water to calm down the bees, knowing that he would have to shake the swarm off the big tree.

Viewed: 205 times.



12:00:26 pm Bending down the tree.

Viewed: 207 times.



12:00:30 pm Ready to do the big shake.

Viewed: 205 times.



12:00:33 pm. Prof. Dyer must be strong!

Viewed: 184 times.



12:00:36 pm Bingo! most bees are off the trunk and into the bee hive.

Viewed: 222 times.



12:00:42 pm. The smoke is probably not necessary and may have caused more bees to fly out.

Viewed: 209 times.

▶ 1 ◀ <u>2</u> ◦	▶▶	▶
------------------	----	---

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Beekeeping](#) ↗

Powered by [Gallery v1.3.3](#)

Swarm-Catching (Impossible)

5 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀



It was June 6, 2000. I got a call from someone who says bees nesting in his house swarmed. Might be mite resistant? Could give it try. But the swarm is like 30 ft up in a tree!

Viewed: 221 times.



I was smiling when going up the ladder. But after being stung a few times up there, 30 feet up in the tree, I thought it was not a good idea to risk my life for the bees, mite-resistant or not... The swarm was too far from the main trunk, and we had trouble cutting the branch. I ended up trying to shake the branch and let bees drop. Most workers did drop, but then they flew back in the mid-air. This must be awesome to watch on a video (but I think David Wang, the video-cameraman, ran away with others when they saw bees rained down!).

Viewed: 212 times.



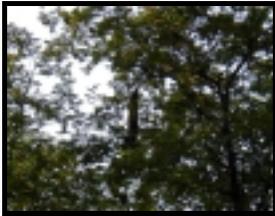
The owner of the house tried to shake more bees down. I was inspecting the cardboard box to see how many bees we got.

Viewed: 191 times.



hmmm. Not that many bees!

Viewed: 179 times.



The swarm looking about the same size when we left...

Viewed: 193 times.

Bee Removal

13 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Beekeeping](#)

▶ 1 ◀ 2 ◦



A student from MSU called me saying there was a large nest of wasps in her house and one can reach it. After seeing her picture, I told her it was honey bees, but if she really wanted to get rid of them, I could help. I thought it was about 6 ft from the ground and it would be easy since the nest was exposed. All my students decided to join the adventure and learn something about bee removal. Sept 5, 2002. 6:30 pm.*

Viewed: 442 times.



A closeup of the bee nest. It looked like there would be a good 30,000 workers there (but in the end, my estimate would be about 20,000 max).

Viewed: 562 times.



A bit of smoke and bees retreated between the combs.
6:38 pm

Viewed: 482 times.



I had three students (who were taking my bee course) who volunteered with me: Emily Jackson, William (Nate) Sneller and Bartek Majewski. I modified a nuc box so that bees can be trapped inside when hooked up to a vacuum. The bees are actually located on the 2nd story and we had to stay on a roof, and even then, the best is about 10 ft from us.

Viewed: 428 times.



We took turns to be the 'bee-vaker' because hands (and neck!) got tired easily. Notice the long handle we put to guide the hose because it is simply too far for the soft vacuum hose to reach the bees. 6:42 pm

Viewed: 359 times.



And more vacuuming. 6:50 pm

Viewed: 256 times.



By now we figured we had 80% bees trapped inside the box. 6:54 pm

Viewed: 373 times.



Nate is brave! Even though he is allergic to bee stings, he still volunteered to be on the roof to cut the combs off so bees would not return the next day.

7:07 pm

Viewed: 336 times.



With half of the combs gone. 7:27 pm.

Viewed: 334 times.



We kept vacuuming the bees off while Nate was sitting above cutting combs. I would be scared in his position because the roof was not flat and his center of gravity was such that he could easily fall...17:30 pm

Viewed: 361 times.

* Comments available for this item.

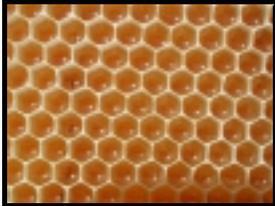
Honey Harvest

3 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀



Glistening honey in the cells -- almost harvest time! Bees remove water and chemically convert sucrose into simple sugars (fructose and glucose) to make honey. When the honey is 'ripe' (water content is <18%), the workers seal each cell with a cap. Well, if we can breed bees that do not cap their honey. it would make extraction much easier. I am ordering an uncapper today (May 28, 2003), which will cost \$1,200 (the cheapest that I can afford!). July 2002.

Viewed: 330 times.



sealed honey has to be uncapped using a tool.

Viewed: 298 times.



students having fun working on the sweet stuff

Viewed: 310 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Beekeeping](#) ↗

Powered by [Gallery v1.3.3](#)

Observation Hive

14 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Beekeeping](#)

▶ 1 ◀ 2 ◦



It is time again to put an observation hive in the bug house -- the MSU insect showcase that attracts hundreds of grade school kids each year. Workers: Mr. Gary Parsons, Insect Collection Manager and George Ayers, Professor of Entomology (He writes 'The other side of beekeeping' for American Bee Journal. Photo by Zachary Huang. May 23, 2003. Time was 11:05:46 am.

Viewed: 158 times.



Gary and George taking segments of the observation hive from the cardboard box.

Viewed: 191 times.



This observation hive has a 'modular' design. Each frame is contained in identical boxes with two sides with glasses and two sides of wood. The top and bottom are open. Therefore after the frame was moved in, they have to be covered with two thin metal plates. Here Gary is removing the duct-tape.

Viewed: 201 times.



Then you can simply slides in the first box.

Viewed: 174 times.



The first frame is nearly in place.

Viewed: 200 times.



Here comes the second frame, inside the second box.

Viewed: 185 times.



Removing rubber bands on the third frame.

Viewed: 176 times.



The third one is in place.

Viewed: 187 times.



Sliding in the fifth and the last one -- if you want to have 10 frames, you simply modify the two end vertical bars so it is longer and can accommodate 10 frames...

Viewed: 185 times.



All the frames are in place, but each is still closed to their own cage. One now has to remove all the metal pieces separating them.

Viewed: 173 times.

Moving Bees

5 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▷ 1 ◁



Moving bees: (photo by Bartek Majewski)

Step 1: seal the hole in the inner cover with screen in case workers come out there. For long distance travel (longer than 5 hour drive, during summer), you may want to replace the whole lid with a screen for better ventilation. Bees can overheat and die when excited during the move.

Viewed: 167 times.



Moving bees: (photo by Bartek Majewski)

Step 2: Screen the entrance with a hardware cloth (must be smaller than 8 mesh), so bees can still ventilate but not escape. Best to use a staple gun for this purpose. The screen shown here is not perfect: it is better that the screen be the exact length as the hive width so no wrapping around is needed, which can create leaking spaces (see the grass here?).

Step 3: to make sure the hivebodies do not shift during travel, you can use the hive

staples to fix the two hivebodies together. Again, this is usually done on the side.

Viewed: 188 times.



Moving bees: (photo by Bartek Majewski)

Step 4: Use tie downs to tie each hive together

Step 5: Load onto the truck

Step 6: Also use tiedown to keep the hives from moving on the truck.

Viewed: 191 times.



Moving bees: (photo by Bartek Majewski)

Step 7: Upon arrival, open the screen to let bees free. Make sure you have a veil! Bees are usually angry after a ride. You would too if you just had a ride with 40,000 of your sisters in a dark, enclosed box :)

Viewed: 178 times.



All done! The hive is now in business. If the move is >3 miles away, you do not lose any bees. If <1 mile, many of the foragers will return to the old site, trying to find a hive in the old location...

Viewed: 179 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Beekeeping](#) ↗

Powered by [Gallery v1.3.3](#)

Queen Cells + Royal Jelly

15 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Beekeeping](#) 

▶ 1 ◀ 2 ◦



Transferring larvae into queen cells, this is the first step for royal jelly production (the same as large scale queen rearing). Beijing, China. May 13, 2001.

Viewed: 314 times.



Workers taking care of a queen cell, the white larva can be seen partially.

Viewed: 310 times.



When the queen is removed or killed in a colony, workers will change worker cells into 'emergency queen cells'. These cells may not have the best quality. The five cells here are all pretty small, for example, perhaps because workers did not use the youngest larvae available. May 30, 2003.

Viewed: 273 times.



Here you see the 'queen' pupa is not that much bigger than the worker pupa, because the larva used for emergency cell was already too old. May 30, 2003.

Viewed: 247 times.



A queen cell near the edge of a frame. A worker has most of her body inside to either inspect or feed the queen larva.

Viewed: 332 times.



When a very young queen cell was opened to expose the larva and the creamy food (royal jelly), workers come to eat the jelly.

Viewed: 285 times.



A queen cell in the center of the nest. This is usually a supercedure cell -- when the queen is getting too old workers rear a new one to replace her. When this happens, the two queens do not fight with each other.

Viewed: 315 times.



Well, I thought, this queen cells seems to be too long! There must be something different...I proceeded to open the cell.

Viewed: 244 times.



It appears that the larva had inadvertently dropped near the mouth of the original cell, so the bees just made the cell longer. normally the larva should sit near the bottom of the cell, but because all queen cells point upwards, I suppose gravity sometimes plays tricks with bees also. The cell on right, on the other hand, appeared to be too small. Several of these sealed cells had a tiny larva in them. Not sure what is wrong. It is possible that workers have used drone larvae for emergency cells, since all other brood closeby are drones.

Viewed: 246 times.



P6020007

Viewed: 226 times.

Honey for Sale

28 items in this album on 3 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀ 2 ◦ 3 ◦



Honey for sale: do you want Pepsi, Sprite, or Coke flavor?

:)

Front yard honey (and pollen) sale in front of a house whose owner rents his back yard to beekeepers. Recycled bottles mean less expensive products for the consumers. Yunnan, China. May 22, 2001.

Viewed: 395 times.



Roadside honey sale, and a few jars of pollen. This is in a apiary next to the rubber tree forest. Beekeepers live in a tent (3-4 of them) and complained of boredom because they have no where to go at night, no electricity, no TV, no villages closeby. This place is about 20 miles from the Xishuangbanna Tropical Botanical Garden, where I stayed for a month last year. Xishuangbanna, Yunnan, China. March 28, 2002.

Viewed: 296 times.



Dried bee pollen in a store. The store belongs to a friend who finished a Master's degree under the same professor who also supervised me temporarily before I left China for Canada for my Ph.D. degree in 1983. Beijing, China. Aug 9, 2000.

Viewed: 256 times.



Honey for sale in recycled water bottles. In the background was a road side apiary, along the sides of a main road of outskirts of Beijing. Beijing, China. June 7, 2001.

Viewed: 210 times.



A lady selling honey harvested from *Apis cerana*. The price is about 5 yuan per half kilo (\$0.60 per lb). The honey is usually robbed from unmanaged colonies. I have also seen honey and brood sold from dorsata colonies. Xishuangbanna, Yunnan, China. April 8, 2002.

Viewed: 265 times.



A closeup of look at the honey from Apis cerana.

Viewed: 279 times.



Honey for sale in recycled water bottles. A lady was reading news in front of her portable house (or a tent). The white chalk characters were 'roal jelly'. Beijing, China. June 7, 2001.

Viewed: 252 times.



Honey for sale at the Schlossplatz market, Stuttgart, Germany. Prices ranged from 8.50 to 13 DM per 500 gram. Most buyers (form what I could tell) are local people, not tourists since it started like 6 am!). Nov. 6, 2001. This was during a 10 day missionary trip (my first one) to reach the Chinese students in Stuttgart.

Viewed: 244 times.



Deutscher Honig (German honey) in a market (Schlossplatz, Stuttgart), Germany. I wish US honey fetch as good a price. Nov. 6, 2001.

Viewed: 275 times.



Bee pollen for sale at the
Schlossplatz market, Stuttgart,
Germany. Nov. 6, 2001.

Viewed: 234 times.

▶ 1 ◀ <u>2</u> ◦ <u>3</u> ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗		

Powered by [Gallery v1.3.3](#)

Non-bees

3 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▷ 1 ◁



Album: Bug me not!

Bugs on my body parts.

Changed: Aug 16, 2003.

Contains: 7 items.

Viewed: 694 times.



Album: Bugs on flowers.

Changed: Aug 12, 2003.

Contains: 1 item.

Viewed: 244 times.



Album: Bugs at other places.

Insects (non bees, non wasps) that are not on flowers or on me.

Changed: Feb 17, 2004.

Contains: 12 items.

Viewed: 370 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗

Powered by [Gallery v1.3.3](#)

Bug me not!

7 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Non-bees](#) 

▶ 1 ◀



fly-on-finger

Viewed: 280 times.



ant-bite

Viewed: 163 times.



bug-on-hand

Viewed: 123 times.



P7040152

Viewed: 140 times.



DSCN3028

Viewed: 124 times.



7-stinglessbee

Viewed: 192 times.



A syrphid fly on my leg.
August 14, 2003.

Viewed: 157 times.

Bugs on flowers.

1 photo in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Non-bees](#) ↗

▷ 1 ◁



Japanese beetles (*Popillia japonica*, Scarabiidae) on basswood (*Tillia* spp) tree flowers. I was really disgusted when I was trying to take pictures of honey bees on basswood, but instead seeing a ration of 1:5,000 (bees : beetles).

Viewed: 151 times.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Non-bees](#) ↗

Powered by [Gallery v1.3.3](#)

Bugs at other places.

12 items in this album on 2 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Non-bees](#) ↗

▶ 1 ◀ 2 ◦



beepollen

Viewed: 105 times.



dorsata-pollencells

Viewed: 124 times.



hatching-ladybeetle

Viewed: 97 times.



ladybeetle*

Viewed: 116 times.



termites-marching

Viewed: 86 times.



treelice

Viewed: 101 times.



weaver-ant

Viewed: 108 times.



weaver-ant2

Viewed: 89 times.



10-4david

Viewed: 111 times.



10-dav_id

Viewed: 76 times.

* Comments available for this item.

▶ 1 ◀ <u>2</u> ◦	▶▶	▶
------------------	----	---

Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Non-bees ↗
--

Powered by [Gallery v1.3.3](#)

Bee research

6 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 

▶ 1 ◀



Album: The Academics.

Zach's photo of bee scientists around the world.

Changed: Jan 09, 2004.

Contains: 10 items.

Viewed: 694 times.



Album: The Keepers.

The people who get the honey, from the bees...

Changed: Sep 11, 2003.

Contains: 1 item.

Viewed: 273 times.



Album: This Webmaster's Bee Lab.

Changed: Aug 19, 2003.

Contains: 5 items.

Viewed: 288 times.



Album: Protocol: Mite Experiment.

How do you create colonies of equal strength, genetic makeup, and mite load?

Changed: Aug 19, 2003.

Contains: 7 items.

Viewed: 270 times.



Album: Protocol: Bee Bleeding

How to be a perfect phlebotomist, for our cute little bees...

Changed: Aug 19, 2003.

Contains: 25 items.

Viewed: 433 times.



Album: Protocol: juvenile hormone measurement.

Changed: Feb 06, 2004.

Contains: 22 items.

Viewed: 302 times.

▷ 1 ◁

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗

Powered by [Gallery v1.3.3](#)

The Academics.

10 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bee research](#)

▶ 1 ◀



Prof. Marla Spivak cleaning a hive body in front of her bee lab. She has an annual equipment cleanup with picnic, with many beekeepers participating. Marla is best known for her effort in breeding the hygienic bees which have shown to be useful against varroa mites, American foulbrood, etc. Sept. 18, 2002.

Her web page is at:

<http://www.entomology.umn.edu/Faculty/spivak/spivcv.htm>

Viewed: 210 times.



Dr. Wyatt Mangum enjoying the sunset at the American Bee Research Conference at Port Deposit, MD. Wyatt teaches mathematics at a college and has done a lot of applied research on honey bee biology. He has a bee equipment museum and his privately-owned beelab has 20 observation hives! Sept. 7, 2001.

Viewed: 143 times.



Dr. Wyatt Mangum and Dr. Tom Webster enjoying the river view at the American Bee Research Conference at Port Deposit, MD. Tom has done work on queen cell feeding behavior, nosema disease and recently on selecting bees that have become naturally resistant to varroa mites. Sept. 7, 2001.

Viewed: 142 times.



Dr. John Harbo performing artificial insemination on queen bees. John is best known for his efforts to breed the SMRD (pronounced as "smart") bees that suppress mite reproduction in a delayed fashion. His SMRI (samuri!) bees has an immediate suppression on mite reproduction. John works at the Baton Rouge USDA bee lab. May 20, 1999.*

Viewed: 156 times.



Prof. Gard Otis checking bees in early spring at the University of Guelph apiary. Gard was a student of Prof. "Chip" Taylor and worked with Africanized bees as a student. Since then he has worked on a variety of research topics, from the biology of newly re-classified Apis species, to breeding bees for tracheal mite resistance. He has an extensive collection of Asian Apis species. March, 1999. His web address is:

<http://www.uoguelph.ca/OAC/env/bio/otis.htm>

Viewed: 157 times.



Prof. Zachary Huang measuring brood cell volume of the Asian hive bee (*Apis cerana*) using a syringe. Zachary obtained his Ph.D. (1988) with Dr. Gard Otis at University of Guelph, Canada. Zachary works on honey bee and varroa mite biology. His best known work is the "social inhibition" model for explaining how workers inside a colony "know" when to become foragers. With his collaborators, he was the first one successfully to accomplish the following in acarines (mites): characterization of neurotransmitter receptors (1990) and cloning and sequencing of a sodium channel gene (2002) . Yunnan, China. April 2002, photo by Guangmin Zhang.

Zach has many web pages:

Dept profile www.msu.edu/~bees

Bee Lab bees.msu.edu

Extension cyberbee.msu.edu

Invention: www.mitezapper.com

Bee Photos photo.bees.net

Bug eating eat.bees.net

Viewed: 210 times.



Dr. Yves Le Conte taking a photo of his indoor hives at his lab. Yves works on honey bee division of labor, semiochemistry and varroa mite biology. He is best known for identifying brood pheromone, a group of 10 simple esters that are secreted by larvae and pupae to signal their age, so that workers can cap them at the right time. These chemicals have many other functions, one of them is to act as attractant for varroa mites to enter the cells, just before worker or drone larvae are sealed. March 16, 2002.

Viewed: 140 times.



Dr. RWK Punchihewa checking his bees at the Baton Rouge USDA bee lab. Puchi did his Ph.D. at Guelph around the same time as me (1983-1988). If you want to learn more about the Asian hive bees (*Apis cerana*), read his book (Beekeeping for honey production in Sri Lanka: Management of asiatic hive honeybee *Apis cerana* in its natural tropical monsoonal environment, ISBN 955-9282-01-8, pp 232, Printed by Sarvodaya Vishva Kekha, Tamalana, Sri Lanka). He is now a senior lecturer at University of Ruhuna, Sri Lanka. Baton Rouge, May 19, 1999.

Viewed: 185 times.



Prof. Gene Robinson in his office, next to an observation hive. He obtained his Ph.D. (1986) with Prof. Roger Morse from Cornell University, did a short postdoc with Prof. Robert Page at Ohio State University, then started his career at University of Illinois at Urbana-Champaign fall of 1989. He spearheaded the honey bee genome project and has been making many splashes in the "sociogenomics" of honey bees. Oct. 10, 2003.

His web page is at: <http://www.life.uiuc.edu/robinson/>

Viewed: 64 times.



Prof. Guy Bloch (right) with Zachary Huang at UIUC. One time they were both postdoctors of Gene Robinson, sharing the same office. Guy now works with honey bee circadium rhythm and how that related to division of labor. Either Dave Schulz or Yehuda Ben-Shahar (now both Drs.) took this photo. May 28, 1999.

His web page is at:

http://www.bio.huji.ac.il/Lec_Details.asp?Lecturer_ID=136

Viewed: 59 times.

* Comments available for this item.

▶ 1 ◀

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) 🏠 Album: [Bee research](#) 🏠

Powered by [Gallery v1.3.3](#)

The Keepers.

1 photo in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Bee research](#) 

▶ 1 ◀



An extension officier showing us his *Apis cerana* bees kept in movable hives. He is trying to pursude beekeepers to switch to movable hives. Yunnan, China. May 22, 2001.

Viewed: 252 times.

▷ 1 ◁

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bee research](#) ↗

Powered by [Gallery v1.3.3](#)

This Webmaster's Bee Lab.

5 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bee research](#) ↗

▷ 1 ◁



Zachary Huang, when he was young, sitting in front of an observation hive. This was during his time as a Ph.D. student at University of Guelph. Photo about 1983. I forgot who took this photo.

Viewed: 158 times.



Zachary Huang sampling *Apis cerana* workers. Yunnan, China. April 2002.

Viewed: 203 times.



Zachary Huang measuring cell diameters of *Apis cerana*. Yunnan, China. April 2002.

Viewed: 170 times.



Anne Hanley examining the status of wax moth larvae. This project was to determine whether transgenic pollen can be used to control wax moth larvae. In our lab study, young larvae had 100% mortality when Cry1F pollen was used to rear wax moth larvae. MSU, Feb 8, 2001.

Viewed: 134 times.



6bee-marking

Viewed: 111 times.

Powered by [Gallery v1.3.3](#)

Protocol: Mite Experiment.

7 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#)  Album: [Bee research](#) 

▶ 1 ◀



Dr. John Harbo, Dr. Jeff Harisson and Dr. RWK. Punchihewa (right to left) at the lab sign of the Baton Rouge USDA Bee Lab. The following is a photo-assay showing how to prepare bees for an experiment. I think that different queens were being evaluated for their ability to suppress mite reproduction. To do so one must start with many colonies as similar as possible (mite levels, number of bees, genetic makeup of bees etc) and the only variable would be the queen genetics. May 19, 1999.

Viewed: 146 times.



A large screen cage is used to hold tens of thousands of bees. The bees were shaken the day before from many colonies. The colonies were untreated for mites so the bees from this pool have many mites. May 18, 1999.

Viewed: 120 times.



The large cage is opened. There are a few frames there to keep the bees happy. If I remembered correctly a few queen cages on different places to keep the bees in.

Viewed: 133 times.



Bees were then scooped into a plastic cup from many different places inside the large cage, to provide bees as homogeneous as possible. These bees were then put into wooden cages, each with a number.

Viewed: 124 times.



Bees are dumped into the wooden caged through a big metal funnel. The cages all have sliding doors that can be shut off to keep the bees inside. These cages are then each weighed, the data entered into a computer. Then the weight is sorted out. Each experimental hive then received two cages, the lightest combined with the heaviest, then the next pair... This way, each colony will end up with very similar number of bees. A subsample of bees are taken to count the mite/bee ratio, so the number of mites can be calculated.

Viewed: 121 times.



Cages are transported in a truck to the experimental apiary.

Viewed: 130 times.



At the apiary, the two cages are open to release the bees. There are three frames in each hive body. A caged queen is also provided. Essentially the experimental colonies are similar to new colonies started from package bees, but each colony now has similar mite levels, genetic make up and age etc.

Viewed: 151 times.

Protocol: Bee Bleeding

25 items in this album on 3 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bee research](#)

▶ 1 ◀ 2 ◦ 3 ◦



Equipment/Supplies (1)

70% alcohol for cleaning fingers and wiretrol.
Wax dishes for fixing bees.
A good ruler for measuring length of hemolymph.

Viewed: 88 times.



At least one insect pin, which is bent so that it is easier to orient to the bee body axis.

Viewed: 76 times.



Equipment/Supplies (2).

We use this type of modelling clay for fixing bees. Available from most hobby stores.

Viewed: 79 times.



Equipment/Supplies (3).

We use this type of acetonitrile from EM Science. Any brand would work as long as they are HPLC grade or higher.

Viewed: 78 times.



Equipment/Supplies (4).

We use Drummond wiretrol capillary tubes. Each 100 tubes come with one plunger (with the white handle). The tubes are marked for 1-5 microliters. However, because we bake all glassware that come into contact with hemolymph or JH, the marks do not stay. We use a ruler to measure the length of blood in millimeters instead. Make sure you know 5 microliters = how many millimeters. In this case, 5 ul = 27 mm, so we know later how convert mm back to ul (1 ul = 5.4 mm).

Viewed: 96 times.



Equipment/Supplies (5)

We use 12 x 125 mm cultures like this. The most important thing is that the lids **MUST** be Teflon lined. Teflon is resistant to chemical solvents and also JH is less likely to stick to it. Never use plastic tubes or lids with plastic lining.

Viewed: 82 times.



Equipment/Supplies (6):

You need a compound scope for pricking the hole and drawing blood. You do not need a high quality one (as shown here), simply 5-7 x magnification to see clearly. I have used naked eyes to do the whole process, but it is very hard on the eyes.

Viewed: 81 times.



Put 500 ul of acetonitrile into each tube and cap the tube tightly.

Viewed: 72 times.



Clearly label each tube before the blood is put in. Otherwise you will easily forget to label it after blood is put in and your sample is wasted.

Viewed: 83 times.



We use an insect vacuum to collect bees from a colony. This photo shows the entrance is blocked with a piece of hardware cloth and the vacuum is used to collect returning foragers.

Viewed: 93 times.

▶ 1 ◀ <u>2</u> ◦ <u>3</u> ◦	▶▶	▶
Gallery: Zach's Bee Photos [(c) Zachary Huang] ↗ Album: Bee research ↗		

Powered by [Gallery v1.3.3](#)

Protocol: juvenile hormone measurement.

22 items in this album on 3 pages

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) Album: [Bee research](#)

▶ 1 ◀ 2 ◦ 3 ◦



5{ ntaining blood (in .5 ml acetonitrile) are extracted for juvenile hormone (JH) by adding 1 ml hexane and 0.5 ml 0.9% NaCl solution. JH ends up mostly (about 98%) in the top hexane phase because JH is more fat soluble (less polar).

Viewed: 4 times.



The tubes are put on ice for 10 min and then centrifuged at 2000 g to give a better separation of the aqueous and hexane phases.

Viewed: 49 times.



The hexane phase is easily removed by using a pipette.

Viewed: 60 times.



Each sample would have its own pasteur pipette (with a bulb) to avoid cross contamination.

Viewed: 4 times.



We repeat the hexane extraction a 2nd time. The hexane (2 ml) must be dried down to concentrate the JH in the sample. We use a Savant solvent drying system (SS21), which includes a vacuum pump (left), a centrifuge (right), and a cold trap [next photo].

Viewed: 3 times.



The cold trap cools to below 100 degrees C to condense the hexane so it does not ruin the vacuum pump.

Viewed: 57 times.



When the vacuum meter shows 300 milli-torr or below, it generally means all hexane is dried off and we can remove the JH tubes.

Viewed: 57 times.



The dried tubes (containing JH) are put on ice to minimize JH loss (JH can be oxidized to become JH acid).

Viewed: 51 times.



We then add 100 microliter (ul) of methanol to the sample tubes and vortex vigorously to wash the JH from the tube.

Viewed: 55 times.



We now take an aliquot (10 ul or 20 ul) out, dry the alcohol, then add 200 ul mixture of JH antibody and radio-labeled JH. JH in the sample will compete with labeled JH to bind to the antibody. Because binding sites are limited, the more JH we have in a sample, the more radiolabeled JH will be displaced from the antibody. Incubation is carried out for 2 hours at room temperature.

Viewed: 54 times.

▶ 1 ◀ 2 ◦ 3 ◦



Gallery: [Zach's Bee Photos \[\(c\) Zachary Huang\]](#) ↗ Album: [Bee research](#) ↗

Powered by [Gallery v1.3.3](#)



About Gallery

- [Features](#)
- [Requirements](#)
- [Screen Shots](#)
- [Download Now!](#)
- [User Testimonials](#)
- [Sample Galleries](#)
- [Web Hosting Referrals](#)

Support

- [I Need Help!!!](#)
- [Documentation](#)
- [Gallery FAQ](#)
- [Discussion Forums](#)
- [Search This Site](#)
- [Features and Bugs](#)
- [Paid Support](#)
- [Wiki](#)

Support Gallery!

Gallery is freeware
 We've spent thousands of hours developing and supporting it. If you enjoy the product, please [send in a donation](#) to help support further development and webserver costs!



Welcome to the Gallery Project Page

Gallery is a web based software product that lets you manage your photos on your own website. You must have your own website with PHP support in order to install and use it. With Gallery you can easily create and maintain albums of photos via an intuitive interface. Photo management includes automatic thumbnail creation, image resizing, rotation, ordering, captioning, searching and more. Albums can have read, write and caption permissions per individual authenticated user for an additional level of privacy. Give accounts to your friends and family and let them upload and manage their own photos on your website!

We hope you will enjoy using Gallery,
 - [The Gallery Development Team](#)

Need help installing Gallery?
[Here's where to start.](#) We do our best to respond to every request for help!

[Gallery v1.4.2 and Gallery Remote v1.3.1 Released!](#)

Posted by: beckett on Thursday, February 12, 2004 - 03:40 AM

Random Images

[Samples- Personal & Family](#)



The Hernandez Family Picture Gallery [\[go\]](#)

::

[Samples- Special Interests](#)



Conan! [\[go\]](#)

Survey

How many albums do you have?

- <10
- 10-100
- 100-1000
- >1000

[[Results](#) | [Polls](#)]

Votes: **1878**
 Comments: **0**

Your Account

- [Register](#)
- [Login](#)
- [Lost Password!](#)

Related Websites

- [NukedGallery.net](#)
- [XoopsGallery](#)
- [Gallery/phpWebsite](#)
- [JadeDragon's Skins](#)

For Developers

- [Gallery Team](#)
- [Project Vision](#)
- [Dev Documents](#)
- [Source Code](#)
- [Mailing Lists](#)

Who's online

We have 475 guests and 13 members online

You are an anonymous user. You can register for free by clicking [here](#)



Gallery v1.4.2 is mostly focused on bugfixes and minor improvements.

Some of these include::

- Improved voting/ranking features
- Gallery internationalized in even more languages!
- Config. Wizard is more informative and friendly
- Improved skins capabilities (more customizable)
- EZ-Prints service updated to their new, friendlier interface
- Tons of small improvements and bugfixes

This version also has security improvements. Gallery v1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.4-pl1, 1.4, 1.4-pl1, 1.4-pl2 and 1.4.1 have a major security flaw, so we recommend that all users upgrade to v1.4.2.

Gallery Remote v1.3.1 is also available now, and has some wonderful new features:

- Major UI change: the albums are now displayed in a tree control.
- New album inspector lets you override upload settings, move albums, download images already in the album, and display full-screen slideshows of the album.
- Drag and drop of pictures between albums are now possible.
- Saving and loading state is now easier and more streamlined; a menu

User Testimonial

"I Love Gallery...as a newbie to installing anything on my server I found it relatively easy to get up and running. I've been running Gallery for 7 months and it's the most popular destination on my site.
www.hosking.org/gallery
I've made my contribution and encourage anyone who hasn't to JUST DO IT! The Windows XP publish feature in 1.3.3 works like a dream. "

Mike
3/15/2003

[\[255 testimonials! \]](#)

Old Gallery News

Friday, January 23

- [Gallery on the political scene](#) (1)

Thursday, January 08

- [Gallery Remote 1.2.1 Released!](#) (0)

Thursday, December 18

- [Gallery Remote for Mac](#) (20)

Monday, December 08

- [We have a winner!](#) (6)

Tuesday, December 02

- [Gallery Remote 1.2 Released!](#) (8)

Wednesday, November 26

- [Gallery 1.4.1 Released!](#) (5)

Friday, November 21

- [Language Packs 1.4.1](#) (10)

Thursday, November 20

remembers the last n saved states.

Download Gallery v1.4.2 and Gallery Remote v1.3.1 from the [Gallery Download Page](#) now!

Update: a couple of mostly UI bugs have been found by early testers of Gallery Remote 1.3; we have re-released 1.3.1 which fixes these bugs. Sorry if you already downloaded it.

11 Comments   19531 Reads

[Available Now: Gallery v1.4.2 Release Candidate 2](#)

Posted by: beckett on Monday, February 02, 2004 - 03:38 PM



The second *release candidate* for **Gallery v1.4.2** is now available.

Changes from RC1 are just a small number of bugfixes and cleanups.

Download Gallery v1.4.2-RC2 from the [Gallery Download Page](#) now!

Please read the [1.4.2 RC1 news item](#) for information on security issues in old Gallery versions as well as backup instructions for your data before installing this release candidate.

4 Comments   7647 Reads

[Gallery 2 Needs a Project Manager](#)

Posted by: bharat on Wednesday, January 28, 2004 - 08:42 PM

- [Gallery Logo Semi-Finalists Chosen](#) (0)

Monday, November 10

- [Gallery Logo Contest Entries Posted!](#) (2)

Saturday, October 25

- [Gallery Logo Contest Deadline Extended!](#) (3)

[Older Articles](#)



One of the most common questions I'm getting now is "When will Gallery 2 be released?".

My answer is generally, "when it's done". Unsurprisingly, this is not a very satisfactory answer for most people, but right now it's the best one that I've got. The reason for this is that the Gallery 2.0 team is still pretty small and we're trying to focus on creating a quality product. None of us are particularly good (or motivated) at project management so it's been very easy for us to keep working on the product and not worry about timelines, deadlines, feature lists, etc.

However, Gallery 2 has become a stable and reliable product so it's getting to be time to figure out the timeline for actually releasing it to the world. Here's where you come in...

2/11 Update: We've heard back from 12+ qualified candidates already! We are in the process of interviewing them and moving forward so we are not entertaining new candidates at the moment.

[Read more...](#) (821 bytes more) 4

Comments   5520 Reads

[Gallery v1.4.2 Release Candidate 1 Available!](#)

Posted by: beckett on Monday, January 26, 2004 - 01:20 AM



The first
*release
candidate* for
Gallery
v1.4.2 is now
available.

This version
is mostly focused on bugfixes
and minor improvements. Some
of these include:

- Improved voting/ranking features
- Gallery internationalized in even more languages!
- Config. Wizard is more informative and friendly
- Improved skins capabilities (more customizable)
- EZ-Prints service updated to their new, friendlier interface
- Tons of small improvements and bugfixes

This version also has security improvements. Gallery v1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.4-pl1, 1.4, 1.4-pl1, 1.4-pl2, and 1.4.1 have a [major security flaw](#), so we recommend that all users upgrade either to 1.4.1-pl1 or to this 1.4.2-RC1 immediately.

Download Gallery v1.4.2-RC1 from the [Gallery Download Page](#) now!

Note: This is a *pre-release* version, and you should be sure to **BACK UP YOUR GALLERY** *before* installing and upgrading your current Gallery. **Read on** for information on how to back up critical data...

[Read more...](#) (1478 bytes more)
comments?   10757 Reads

[Gallery v1.4.1-pl1 Security Patch Release](#)

Posted by: beckett on Saturday, January 24, 2004 - 10:40 PM



Notice if you use Gallery versions 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.4-pl1, 1.4, 1.4-pl1, 1.4-pl2, and 1.4.1 (current release):

We have discovered a well-hidden but potentially serious security flaw in these versions of Gallery which can allow a hacker to remotely exploit your webserver. All Gallery users are *strongly* urged to upgrade to 1.4.1-pl1 immediately, which fixes this serious problem and will secure your system.

Thanks to Fred (vrotogel) for quickly alerting us to this issue.

Gallery 1.4.1-pl1 can be downloaded from the [Gallery Download Page](#).

If you use version 1.4.1 and would like to patch your existing installation rather than downloading the full updated version, click to read on...

[Read more...](#) (2045 bytes more)

9 Comments   10658 Reads



We use Sourceforge to manage our project. You should, too!

Theme design by Tony Mayer of [tonicmedia](#)

All logos, trademarks and content in this site are property of Bharat Mediratta © 2000-2003.



Cyberbee.msu.edu

Home

About

Bees@msu

Bees4Kids

Beebase

BeeBiology

BeeCalendar

BeeContact

BeePhotos

BeeProducts

BeeResearch

BeeStats

General News

Research News

Zach's Column

CoolBeeLinks

SearchCyberbee

BeeMyGuest

CyberBee is a service
provided by
Zachary Huang
Dept Entomology,
MSU

©Zachary Huang

[Site statistics](#)

Welcome to cyberbee.msu.edu!
please click [here](#) for another picture
Also checkout the new searchable
[photobase](#).

Photos copyrighted, all rights reserved by Zachary Huang
Main photo page viewed 19234 times since May 12, 2003



HOPS Press, LLC

Thomas J. Elpel's
Web World Portal



Granny's Country Store

- Primitive Living Supplies
- Plant ID and Ecology Guides
- Home-Building Books
- Green Goods for the Home
- Books & Gifts for Kids

HOPS Press, LLC

Self-Service
Instant Wholesale Discounts

Primitive Living Skills

- Hollowtop Outdoor
- Primitive School, LLC
- Tom's Journals
- Skills Articles
- Directory of Schools

Sustainable Living

- Alternative Construction
- House-Building Classes
- Articles & Resources
- Ecological Economics

Wildflowers & Weeds

- Plant Identification & Edible Plants
- Rangeland Ecology
- Weed Control Alternatives

Society of

Primitive Technology

- Bulletin of Primitive Technology
- On-line Articles
- Subscription Information

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new on all our websites!

HOPS Press, LLC

website orders are processed by:

Granny's Country Store

PO Box 684



Mariposa Lily
From The Wild Flowers of California, 1927

HOPS Press, LLC
www.hopspress.com



Illustration by
Roger J. Yazzie
© 1998

**HOPS Press, LLC
& Granny's Country Store
-Working for a Better World-**

"In order to create a truly sustainable economy we must mimic the ecosystem so that the waste of every household and business becomes resource inputs to other enterprises, and the only waste produced is diffuse, low-grade heat from renewable resources like solar."

**--Thomas J. Elpel
Direct Pointing to Real Wealth**

If you have read my books, then you know that making the world a better place is the one thing that motivates me to get up and go to work each day. I write and teach about plants and primitive skills to bring people closer to nature. We built our own home for maximum resource efficiency, and wrote about next generation home building in my book *Living Homes*. I research and write on economics and ecology to help steer the world towards sustainable development. My whole reason for writing books or being in business is to help make a greener world. The way I see it, business and money are powerful tools with the potential to make positive change in the world.

All this leads to the question: What is our environmental record in business? How effective have we been at closing the loop on waste and supporting earth-friendly causes?

About HOPS Press, LLC

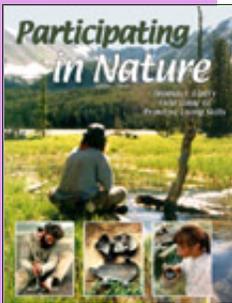
When we first started HOPS Press, LLC, we didn't worry too much about the recycled content in our books, simply because we were learning the ropes of the publishing business and had all we could handle at once. But each time we returned to the printer we asked for more earth-friendly production. Direct Pointing to Real Wealth includes about 30% post-consumer recycled content. With Living Homes, everything but the cover is printed with soy ink on 100% post-consumer recycled paper, bleached without chlorine. Botany in a Day is now printed with soy ink on 100% recycled content as well. And the newest printing of Participating in Nature (November 2002) is our greenest book yet. Even the cover is

Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

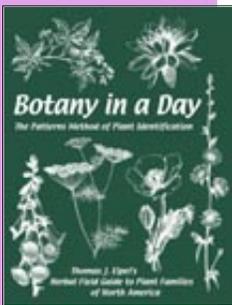


This Website Created on a lovable
Macintosh computer!

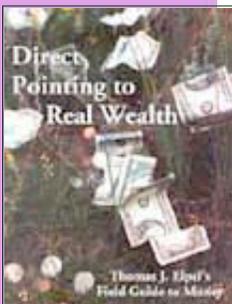
Books authored by
Thomas J. Elpel



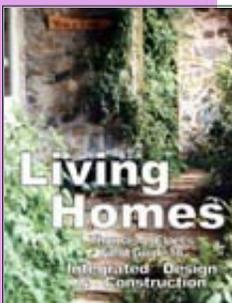
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

printed on 100% recycled paper.

- \$1 from every copy of [Living Homes](#) sold is donated to the Institute for Solar Living to support their work promoting sustainable living through inspirational environmental education.
- \$1 from every copy of [Direct Pointing to Real Wealth](#) sold is donated to the Alternative Energy Resources Organization in Helena, Montana to support their work promoting "smart growth" planning and transportation alternatives, renewable energy and conservation, environmental quality, and community self-reliance.
- \$1 from every copy of [Participating in Nature](#) sold is donated to [3Rivers Park](#) to help purchase habitat for people and wildlife in the Missouri Headwaters watershed in southwest Montana. In our previous printing of *Participating in Nature* we donated \$1.00 from every copy sold to the Montana Wilderness Association, raising about \$2,500 in three years to support their support their work protecting our last best places.
- \$1 from every copy of [Botany in a Day](#) sold is donated to [3Rivers Park](#) to help purchase habitat for people and wildlife in the Missouri Headwaters watershed in southwest Montana. In our previous printing of *Botany in a Day* we donated \$1.00 from every copy sold to United Plant Savers, raising \$4,556 in two years to support their work to protect medicinal plants and their habitat for future generations.

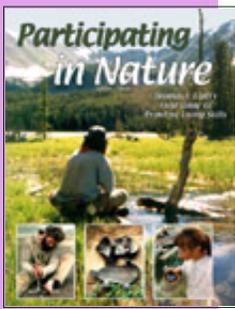
Shipping: Wholesale Orders are packed at Granny's Country Store. Most wholesale orders are shipped in second-hand boxes, padded with second-hand peanuts or crumpled newspapers and magazines. We rarely purchase any additional shipping boxes.

Videos: We also produce educational videos tapes. A critical concern to us was that we did not want to consume new resources for our video tapes. Fortunately, we found a supplier of quality reusable tapes.

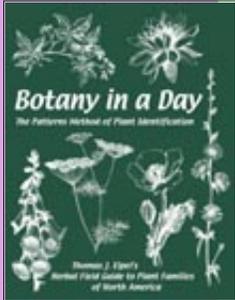
[EcoMedia Recycling](#) accepts all grades of magnetic media tape (video cassettes/audio cassettes) for recycling. Most of the tapes are destroyed and used as feedstock for new products. However, EcoMedia also collects many "duplication grade one-pass video tapes". These tapes have been manufactured for professional, high quality duplication and have been recorded once but never played. Instead of disassembling the tapes for salvage, they are diverted for reuse. The tapes are visually inspected, erased, cleaned and burnished. Then the audio and video tracks are are mechanically inspected for quality. Finally, the tapes are erased again, to insure that all copyrighted material has been thoroughly erased. The tapes are guaranteed error free.

Our videos [The Art of Slipform Stone Masonry](#) and the [Art of Nothing Wilderness Survival Video Series](#) are produced on these recycled video tapes for a truly green video product. Now we are in a position to recommend recycled tapes to the other vendors we purchase video tapes from.

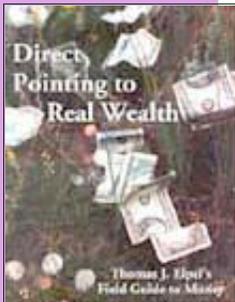
About Granny's Country Store



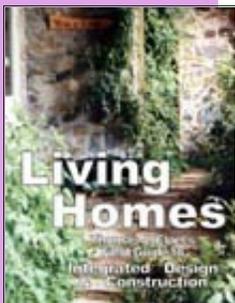
Participating in Nature



Botany in a Day



Direct Pointing to Real Wealth



Living Homes



When you place a an order using our on-line shopping cart system, then you are purchasing directly from Granny's Country Store. Besides my titles, we also carry books and videos from outside publishers and vendors. Most of them have little or no recycled content in them, but we carry them as tools for people to get closer to the natural world. Other items we sell include primitive friction fire sets, which are made from ethically wild-crafted natural materials, except for the nylon cords. Eventually we will give each product an environmental rank to highlight those that are especially earth-friendly. We will also encourage the vendors that we buy from to increase the recycled content of their products.

Shipping: Most of our retail orders are shipped in Jiffy Padded Mailers manufactured from 77% recycled paper, including 62% post-consumer fiber. Other retail orders within the USA are shipped in Priority envelopes and boxes provided by the United States Postal Service, made from 100% recycled paper, including 80-100% post-consumer fiber, and printed with soy inks. Be sure to recycle your own papers to help close the loop on waste!





Return to [Books & Videos by Thomas J. Elpel.](#)
Return to the [HOPS Press, LLC Home Page.](#)



How to Place Retail Orders

[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605

E-mail Contact Page

Thomas J. Elpel's Web World Portal

Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

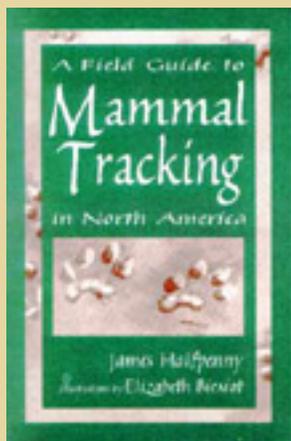
Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids



Mammal Tracking in North America

by Dr. James Halfpenny

"quite simply the best book ever written on the subject." --The Mother Earth News

Jim Halfpenny has taught tracking since 1967, and today he continues to lead people out to find the wolves of Yellowstone Park or the polar bears of the arctic. His book *Mammal Tracking in North America* includes everything you need to know about track identification, gaits and following trails. Halfpenny takes special care to provide track comparisons between similar species, so you can identify tracks with confidence and accuracy.

The book includes hundreds of artistic and precise illustrations by Elizabeth Biesiot, including stop-motion style drawings to better communicate the gait patterns, plus a handy photo gallery of scat for easy comparison. *Mammal Tracking* is just the right size, weight and content to bring on every outdoor trip. 1986. 163 pages. \$15.00.

Mammal Tracking in North America \$15.00

Quantity:

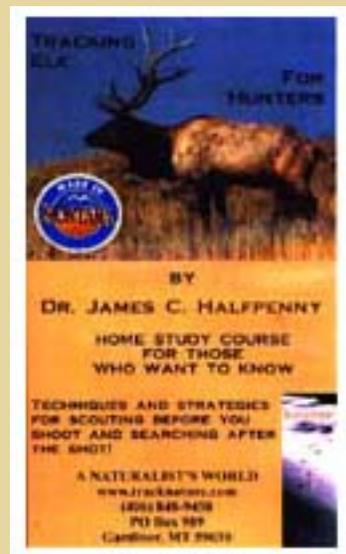
Tracking Elk for Hunters

video by Dr. James Halfpenny

Anyone who has worked with video knows that what the camera sees can be very different from what the human eye sees. Tracking can be especially difficult to portray on video, since the tracks or track details may not show up at all on camera. However, Jim Halfpenny has done a superb job of making the invisible truly visible through his video work.

It is also very difficult to hold the attention of the audience with just one person on camera, but Halfpenny is a very dynamic speaker, and the tapes are well edited, so the viewer is easily captivated by his enthusiasm for the subject.

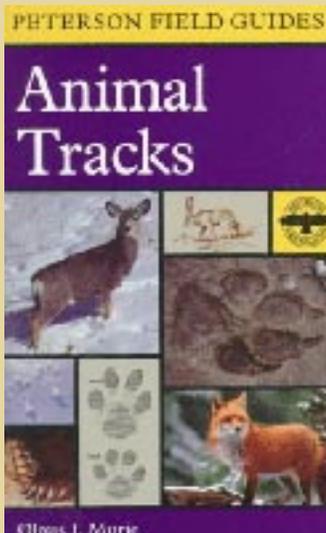
Tracking Elk for Hunters is especially designed to help hunters interpret elk track and sign, determine the sex of the animals, predict where and when to find them, and ultimately track them after the shot. Whether you are a hunter or not you will learn all kinds of tips about elk and their habits. It is a very well done video, and most of the material presented in it is new and different from what is presented in Halfpenny's book or his other videos. Cost: \$40.00.



International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. For our European customers we may be able to special order PAL format. Please send an e-mail to us through our [E-mail Contact Page](#) to inquire.

Tracking Elk for Hunters, VHS video \$40.00

Quantity:



Animal Tracks

A Peterson Field Guide
by Olaus J. Murie

Animal Tracks is a classic book based on Murie's research starting in 1921 and first published in 1954. Almost fifty years later it is still one of the best books on tracking.

Animal Tracks is especially helpful for track identification of the smaller animals, the woodchucks, ground squirrels, tree squirrels, chipmunks, rabbits, gophers, rats, mice, voles, shrews, etc. It also covers the more obscure animals that are not covered in other books, such as the ringtail, peccary, armadillo, seals, opossum, birds, reptiles and amphibians-even insects! The book includes more than 1,000 illustrations covering both the tracks and gaits of more species than you would have thought existed in North America. Animal Tracks even covers the domestic livestock-sheep, cows, horses and pigs-to help you distinguish them from their wild cousins. \$18.00.

Animal Tracks: A Peterson Field
Guide \$18.00

Quantity:

[Return to Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

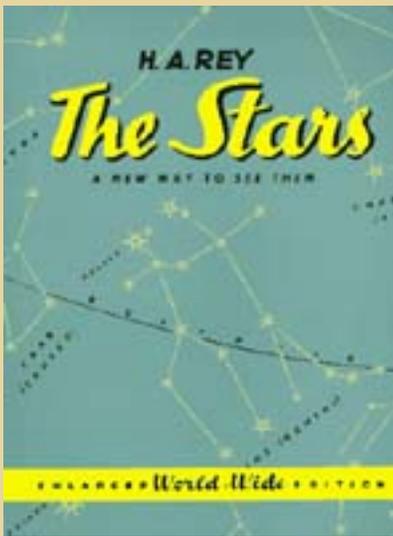
Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then

click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
**[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
**[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
**[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)******

Granny's Country Store Departments
[Tom's Books & Videos](#)
**[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
**[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)****



The Stars: A New Way to See Them

by H.E. Rey

Most star books depict the constellations as either elaborate allegorical figures bearing little relationship to the stars, or as geometrical hieroglyphs without meaningful shapes. But now you can learn the constellations as simple, easy-to-recognize stick figures, thanks to H.A. Rey's classic book, *The Stars*. I studied out of this book more than a decade ago, but today the constellations are still immediately recognizable to me. It is like seeing old friends in the sky every time I walk outside at night, and they always help to guide me on my night-time expeditions.

The Stars includes user-friendly models illustrating the phases of the moon and the changing seasons, plus fascinating trivia about stars, the solar system, and the galaxy. This book is great for adults and easily used with kids. Almost fifty years after it was first published, *The Stars* is still the best book on the subject. 160 pages.

Cost: \$12.00

The Stars \$12.00

Quantity:

[Return to Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC

Primitive Living Skills | Sustainable Living | Wildflowers & Weeds

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids

Awareness Books, Tapes, Resources and Perspective

by Thomas J. Elpel & Jeff Blend

Thanks to everyone who has helped to review and edit this piece!

What is the single most important survival skill? Awareness! It doesn't matter whether you are in an emergency survival situation, out for a weekend camping trip, or even in your own home. You might be running a business, tackling a social or environmental problem, or simply investing money in the stock market. In any situation the most important skill is always AWARENESS or consciousness about the potential opportunities and threats around you. Awareness not only alerts you to what is around, but also brings you inward so that deep learning and understanding can take place on a physical, mental and emotional level.

In a winter survival situation, for example, you must be aware of when to start a fire, what to start it with, and where to build it. If you have any doubts about this, just read Jack London's classic story, *To Build a Fire*. After falling through the ice into frigid water the man in the story is struggling with cold fingers and a falling body temperature to get a fire. After many failed attempts, he finally gets his fire--his last hope for survival-- only to have it extinguished by snow falling from an overhead tree bough. If only that man had looked up!

Now it could be reasonably argued that this is all a matter of semantics--that fire-building is really the most important skill. Awareness about when, what, where and how to build fire are implicit in the skill. The same could be said about life in the city, that there are awareness skills specific to survival in urban environments--things you must be aware of to avoid being mowed down in the middle of the road or mugged in a back alley. In this sense, awareness is not an independent skill, but simply part of every other skill that you learn. Or is it?

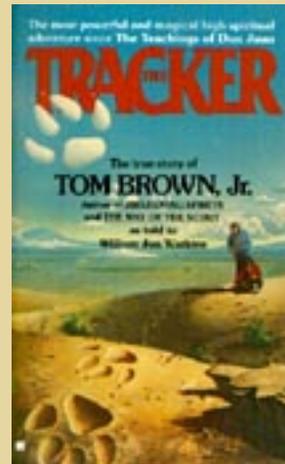
If awareness is to be considered a skill in itself, then it must be something you can take from a situation like wilderness survival and apply it to another situation, such as running a business. The purpose of this paper is to make the case that awareness is indeed an independent skill that will aid you in any environment or situation. And yet, awareness itself is implicit in all other skills that we practice, so in a way it is very interdependent with everything we do from building fires to brushing our teeth.

Let me emphasize that awareness is developed through the practice of survival skills and tracking as much as through specific techniques for expanding your capabilities of observation. The expanded capability for awareness that you gain through these pursuits will aid you in everything that you do, even in the modern world. If you can bring the observations learned from tracking, for example, to a simple and mundane activity like signing your name on a check, you may learn a lot of very important things about your general state of being when writing the check (e.g. your relationship with money, whether or not you are impatient in everyday life, etc).

In this discussion I include my own experiences in developing the skills of awareness, as well as the books, tapes and other resources I have found helpful in that pursuit.

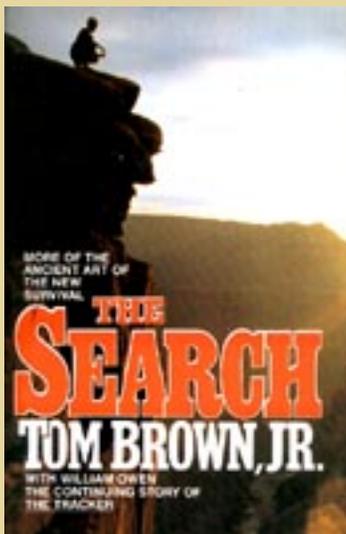
Tom Brown Jr. Autobiographies and Field Guides

As a teenager I virtually lived in Tom Brown's books. I bought each one as soon as it was published. I practiced wide-angle or peripheral vision and "fox walking" continuously. I practiced these skills in school, noticing life outside the windows while listening to lectures in class. In gym class when we were jumping hurdles, I was proud to over hear one girl say to another, "He runs like a deer!" After school I walked to a nearby wooded thicket to follow tracks and observe nature. I built my own camp there with a half-insulated debris hut and a campfire.



I taught myself to break the spell of the television, to be aware when people came into or left the room during a show. I learned to follow the landscape with my peripheral vision while reading in the car, so I always knew where we were and what was going on outside. I always knew where everyone was in the house, even while deep in a book. I kept a sandbox in my bedroom for studying tracks.

My grandma was the main influence that triggered my interest in primitive wilderness survival, but it was Tom Brown's books that fired my imagination for the possibilities. In the stories Brown describes the way he learned about primitive survival and tracking with his friend Rick under the tutelage of Rick's grandfather Stalking Wolf. As a reader you are easily caught up in the stories, desperate to learn what Tom and Rick did. Through these books Tom Brown has single-handedly inspired tens of thousands of otherwise rational adults and urbanized kids to let out their inner child and go play in the woods.



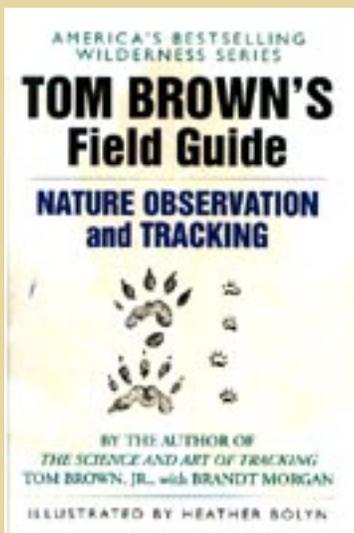
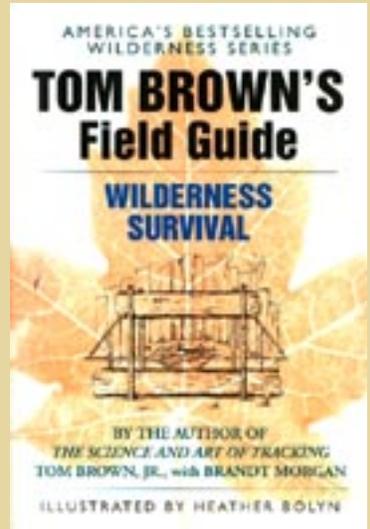
Tom Brown's stories about survival, tracking, and greater awareness are so fantastic--especially to those who are searching for deeper meaning in life--that it is easy to elevate him to a god-like status. It is just like Beatlemania, N-SYNC, or any other idolized public symbol, where it seems your life will somehow be improved if you can just be near such a great person. I've been there, and I've seen hundreds of other people doing the same thing, espousing the gospel of Tom Brown--talking incessantly about him, what he has done, and what he teaches and preaches.

There is a saying that in the path of knowledge and wisdom you have to "kill the Buddha". That is, you have to knock your idols and mentors down from the pedestals you placed them on, in order to learn what they are really teaching. It was a shock and a heart-break for me the first time I heard anyone say something bad about Tom Brown Jr., but it also helped jar me back into reality and increased my internal awareness. I write

that here, because you cannot learn the awareness techniques that Brown teaches until you break through that spell over his apparent greatness.

I have had the opportunity to experience idol-worshipping from the other end too, when one of my readers was literally hypnotized by my presence. It was a strange experience to be followed around all day long by someone who just wanted to be close to me, as if something good would rub off. (Fortunately this is a rare occurrence!) This individual would have followed me into the bathroom if I had let him. Having experienced idol-worshipping from both ends, I've since revised my writing and teaching practices in an effort to temper people's expectations before they meet me.

It is interesting to notice how words on a piece of paper elevate one so quickly to the status of "authority", whether that status is warranted or not. For example, many primitive skills articles--including some of mine--were written by individuals who only tried a particular skill once, then wrote about the experience. I'm not saying that is a bad thing to do. Organizing your thoughts on paper is a great way to learn and solidify your experiences into real knowledge. The problem is that the writer is elevated to a status where it seems they must have done the skill for years, even when they didn't. I write this here to help you become more "aware" as a reader.



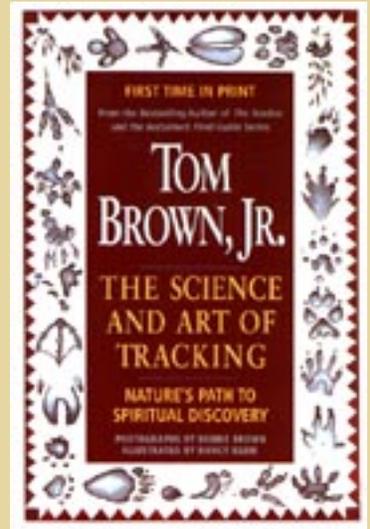
Writing is often embellished too, either directly or by recombining separate events to make a composite story. The most simple embellishment is an "embellishment by omission", which is to focus on one's successes and high points while omitting one's short-comings. A person who is good at something only fifty percent of the time can use that material for one-hundred percent of a story, thus creating an image that is much better--essentially flawless--compared to the their actual skill level.

When I realized I was setting myself up for a fall, projecting an image that is much better than my skill level, then I altered my writing to include my short-comings (especially evident in my on-line camping journals). I do not want anyone to come to me expecting to get something I do not have and cannot give.

For those who are interested in wilderness survival and nature awareness skills, I highly recommend Tom Brown's books to fire the imagination. From his books you can discover the possibilities, just be "aware" of the pitfalls of placing him on a pedestal. My favorite titles from his autobiographies and field guides are available here. Please scroll down to the end of the page for an on-line order form.

Nature Awareness and how it Relates to Everyday Life

The primitive skills taught at wilderness schools nationwide are those that were used by native populations (including Native Americans, African Bushmen and Australian Aboriginals) to survive in their natural surroundings. In December 1999 I gave a presentation on these skills that piqued the interest of Jeff Blend from Helena, Montana.



Jeff has long been interested in awareness of his internal self and his surroundings. He practices the arts of yoga and meditation. Since he started practicing primitive skills, he has told me several times that these skills are most valuable to him for the awareness they give him, as opposed to the actual skills involved. Projects like making cordage or starting a fire-by-friction become the means for Jeff to plug into his deeper self and to learn about his surroundings. Through awareness--being in tune with the moment--the skills come alive with exciting possibilities and reinforce his connection with Earth. Without that awareness, the skills are usually "just another chore, like doing the laundry", says Jeff:

"I practice primitive outdoor skills for the awareness they bring me. Primitive skills embody aspects of two very important things in my life: nature's wild energy and yoga's centering power. Really, these two things are one in the same because Yoga is simply the act of being present and accepting of everything that happens to you. That is exactly what nature is all about.

On primitive expeditions participants must often deal with hunger, cold, soggy and general discomfort because they intentionally do not bring along conveniences such as tents and cook stoves. While attempting to eat, stay warm, sleep and stay hydrated outdoors-- with little or no modern camping equipment-- they must tune into the present to deal with the situation. They must adapt to the harshness and uncertainty of meeting the body's basic needs in nature. If the weather becomes nasty, for example, then they must react and perhaps find shelter or at least stay warm. This requires courage, flexibility and the ability to stay calm in the midst of a tough situation.

"Once a person breaks down their comfort zone and releases dependence from their material things and normal routine, something happens on the inside. The 'primitive participant' begins to let actions flow based upon intuition and instinct. They lose that nagging sense of clock time and social obligation. In fact, they may lose the sense that they are an individual 'I' or 'me' at all! Instead, they become very connected to their landscape in a way that breaks down the barriers that separate the 'I' from everything else. This is a sign that one is naturally moving into a meditative state and truly living in the present.

Sitting on a meditation mat with incense burning is not needed for one to become

"enlightened" or present, because one is already meditating on the primitive task at hand. It is much easier to stay in the present moment when concentrating on an essential task such as starting a fire for warmth than when making more mundane decisions such as what to watch on TV. This is why so many seek out the challenges of the outdoors or the challenges inherent in starting a business or extreme skiing.

"Because of its raw nature, primitive living demands flexibility and the ability to remain calm in any situation--even while you push beyond perceived limits. Interestingly, these are the same ideals encouraged by ancient Yogis and martial artists in the Far-East. When one needs to do something to survive and has only the materials around them, it is amazing how much ability we all have to improvise and really use our heads. It is no wonder that so many outdoor skills schools are being set up as alternative therapies for troubled children and teens who need to look inward to deal with deeper issues.

"Primitive expeditions wake up dulled senses and snap us out of our petty dramas into the present reality of nature. The garbage of mind and body is shed because there is really no margin for it out in the bush. I am not thinking about politics or the stock market when I am very hungry and am trying to make a meal that may or may not succeed. In yoga, we use the difficulty of a headstand or of sustained compassion to continually keep the spirit awake and aware. With primitive skills, it is the challenge of surviving and the direct participation with the planet that cultivates that same awareness.

"I took my first outdoor expedition with Tom Elpel in the middle of a Montana winter and got a 'trial by fire' of how hard it is to live off the land. I was miserable for the first two days due to cold, hunger and the disruption in my schedule. With only a blanket for bedding and about one cup of simple food per day, my feet were always cold and my stomach perpetually empty. I swore I would never participate again in such a venture and almost left the group to hitchhike home. On day three, I couldn't get a fire started with my bowdrill set and finally walked off alone and after some meditation, cried for an undetermined amount of time. Once I let my emotional defenses down and detached from my ego, I felt great and then started a fire very quickly. The next four days were incredible as we walked across the landscape building shelters and learning about plants. I had released a lot of 'garbage' in the crying session and felt better than I had in a long time physically, emotionally and spiritually. By the last couple of days, time took on a new meaning and I pretty much lived every moment of those days in the present. I was so full of joy and wonder that I even found humor in our snowball fashioned toilet paper!"

Does Nature Awareness Help the World?

One of the central themes of Tom Brown Jr.'s work is awareness of "the whole", to take the details of individual tracks or events and connect them to the larger story. For example you would look at the tracks and behaviors of mice and pick up clues from that about what the owls are doing. He doesn't provide many specifics on the topic, except that it requires lots and lots of "dirt time" to learn it.

A question that bothered me while growing up was whether or not that kind of intimate

knowledge about the interactions of owls and mice or anything else was really relevant to the larger world picture. For example, a really good tracker may be able to track mice or rabbits across western rangelands, studying the soil every step of the way, but would they notice that the bare ground between the plants is increasing from year to year?

Range ecologists never made that connection, because traditional management tools evaluated the health of the grass itself, rather than the soil. By itself the grass could score a high rating, even though there was less of it each year. As it turns out, Allan Savory, the individual who identified the critical role that hooved animals play in maintaining arid rangelands, made the discovery while man-tracking during the civil war of Zimbabwe in the 1960's. Tracking forced him to look at minute details on the ground. His job led him through wild lands, pasture lands, crop lands, and rested lands all across the country, often through several regions in a single day. He noted that the healthiest lands were those that were beaten by the hooves from massive herds of animals, while the worst lands had few or no animals on them. **(For more details on range ecology and desertification, be sure to read my article [The American Sahara: The New Desert Beneath Our Feet](#).)** Although Allan Savory was able to make the connection thanks to his tracking work, I've seen no evidence that any other trackers have been able to make the same leap.

So it seems that while tracking and nature awareness skills can create the opportunity to see the larger picture of ecology, there is no guarantee that a person will actually make that leap. Nevertheless, I think that these skills at least facilitate the opportunity to tune into the observations of others who have made those connections. And just as importantly, nature awareness skills can help us to spend more of our time in all situations really observing what is out there and not falling prey to media, programming or general lethargy.

For example, learning to start fires with a bowdrill set is a skill that requires and develops your awareness, because you need to be aware of what types of woods are best to work with and where to get them. But even if you worked with a resource like cottonwood for years and years, you might not ever notice that along many rivers there are only mature trees and no young ones.

The problem is that cottonwoods require flooding to establish seedlings, so the river downstream from a dam often has no new trees. It is a simple observation, but most people would miss it, even after spending years around cottonwoods. We tend to accept our world as it is, without questioning the basics. The difference is that if you are practicing primitive skills and nature awareness then you are far more likely to tune into a news report about cottonwood ecology. Thus you may not develop the awareness skills to pick up on cottonwood ecology by yourself, but you will be alert to it if someone else makes the discovery. That alone is very valuable, and can be used to monitor your own actions at work, at home and with others.

For example, you might look into how to live sustainably at home and ultimately save

money and resources. Without this awareness, you might not think twice about how you live. You might just pay your high energy bills and take out your five bags of trash every week, as if that were perfectly normal!

Through the awareness and attention inherent in the primitive experience comes a respect for the Earth that words cannot express. Living off the land, one sees how they affect the environment with every act of consumption and respect is generated. In modern society, most living necessities are conveniently provided by others. Farmers grow our food, carpenters build our houses, utilities provide our power and laborers make our clothes. Fossil fuels--energy borrowed from the past--run a majority of our culture and make most of us materially wealthier as a society than ever before. As a result, most of us have few skills that provide our basic needs. Instead, we know the living skills for modern survival such as driving, good writing, check book balancing, computer literacy and information processing. While these are extremely important, they tend to keep us apart from the planet and its subtle energies. Comfort becomes our master if not occasionally broken.

Our necessities are easy to come by because we have the technology to easily obtain them. Stoves and lighters ignite with a touch of the hand, food is always available at the store and gasoline is cheaply available. Therefore, most of us take these things for granted and think we should have them immediately and cheaply. Some of us tend to lose our humility and respect for the Earth as a result. Taking four hours to start a fire, on the other hand, gives one the humble feeling of what it really takes to biologically sustain us.

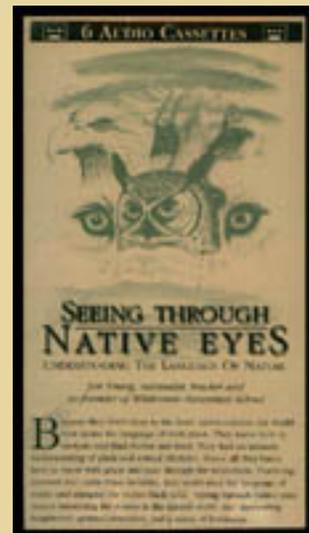
The awareness that you gain in the outdoors is easily transferred back to life in the modern world. You will notice the resources we consume and the foolish ways that we waste them, such as building new houses with most of the windows facing north. Even the most lowly reptiles know enough to take advantage of solar gain on a cold day, yet so many people fail to recognize the obvious and spend thousands of dollars consuming fuel to heat a house that would have mostly heated itself, if only it were turned around!

Through primitive skills and nature awareness you will realize that we live in a world of great abundance. Our environmental problems are not due to a shortage of resources, but to a shortage of awareness about how we use those resources.

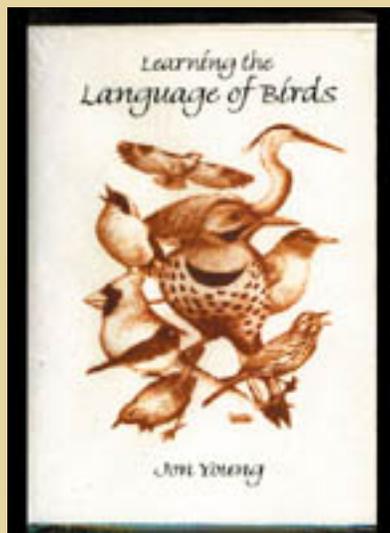
Jon Young Audio Tapes

One impression I had from Tom Brown's books was that the path to knowledge and wisdom was to spend thousands of hours of "dirt time" studying minute details of tracks and behaviors, comparing those to the greater whole. I desperately wanted to go out and learn everything directly from nature, but was discouraged when I didn't seem to get anywhere that way.

Ultimately I realized that our ancestors spent not just thousands of hours, but literally thousands of years of dirt time to progress from one idea to the next, such as from the atlatl to the bow and arrow. Nature is in many ways like a university of knowledge, but without guidance it is the campus only. It is helpful to have teachers--at least some good books and resources--to outline a path forward. Once you have an inkling of where to go, then you can make your own unique discoveries in the natural world.



A particular topic I wanted to learn, but didn't know where to begin, was learning how to read the "concentric rings of nature" as Brown describes it. The idea is that a disturbance anywhere in the forest sets off an alarms that reverberates through the woods. If you could learn to read the signals then you could sense what is happening far beyond the range of your five senses.



The process for deciphering the concentric rings was first out-lined by Jon Young, who's original "claim to fame" was being Tom Brown's first student and the first instructor at Brown's school. Jon Young has since distinguished himself and his work through his audio tapes and naturalist correspondence training programs.

Many books and tapes about nature skills require that you have access to wild lands to hone your abilities. But Jon Young gives you awareness skills for the country or the city. His tapes are especially helpful for people who have the desire to learn but not much time to spend in the woods.

The *Seeing Through Native Eyes* series bears some resemblance to the material presented in the Tom Brown Field Guides, but through Jon's fresh perspective. The best tape of the Native Eyes series is definitely *Learning the Language of the Birds*. In this tape Jon outlines a simple and universal system for interpreting bird calls and the concentric rings of nature through recognition of "base-line" or normal behavior versus alarm calls of various intensity. You do not even have to know the names of most birds to be able to interpret meaning from their calls. *Learning the Language of the Birds* is also available as a single cassette.



Jon Young also produced a six-tape series called *Advanced Bird Language*. The former tape is still the most important one for understanding the basic theory of understanding bird language. The value of the new series is that Jon puts theory into practice, describing the process of learning and using bird language. Especially helpful are Jon's numerous stories of field experiences where he and others have used bird language to read the forest around them. He gives tangible examples of how disturbances ripple through the concentric rings of nature. Please scroll down to the end of the article for an on-line order form.

Learning to See

As a naturalist you can make interesting observations everywhere in nature, even from a pile of crap in the woods. With basic training you can identify such things as the animal that dropped it, as well as what plants or animals they ate and about how recently they were there. But to make these simple observations you need to know the animals and their scat types and the possible plants or animals they might eat. Although nature observation sounds romantic and fun, much of the process involves book learning and rote memorization. The more names, facts and figures you know, the more exciting and in depth your observations are likely to be.

I spent much of my childhood memorizing plants, because I had the necessary resources and the desire to learn. My grandmother taught me many wildflowers on our walks, and from there I wanted to learn the rest. I brought samples back to the house and spent hours flipping through pages and pages of color pictures trying to match the specimens to the photos. If I could not identify a plant that way, then I brought it into the herbarium at the university where the botanists would key it out and give me a Latin name. Back at home I looked up the Latin name in my books and read everything I could find about the plant. I constantly quizzed Grandma about the names of plants and flowers we found on our walks. The funny thing is that although I "knew" hundreds of species of plants, I never really stopped to look at them!

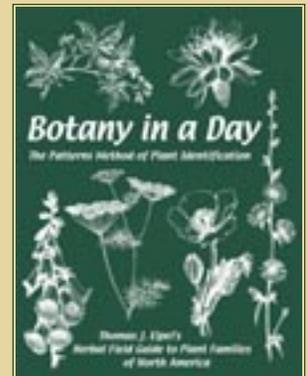
That statement may seem surprising, but stop and think about it. Chances are you can probably identify a dandelion, but did you ever stop to study one in such detail that you can still see every part vividly in your mind... so well that you could draw one from memory? It is easy to become familiar with something without ever taking the time to

study it.

I was familiar with hundreds of species of plants that I recognized on my walks with my grandmother, but I never stopped to observe the most basic features, such as alternate or opposite leaves, or the number of petals, or what it looked like inside the flowers. I never really looked at people either, although I certainly knew and recognized many of them. The funny thing is that I seldom recognized my neighbors if I bumped into them in another town. I usually had to "meet" people about ten times before they became familiar enough for me to remember them.

I was shocked and thrilled the first time I looked at wildflowers, more than ten years after I began learning them. It all started during an herb walk at our school, when the herbalist pointed out some basic patterns about flowers. She showed us several members of the Rose family and pointed out that they all had flowers with five petals and usually numerous stamens. She said that most members of the Rose family were astringent, and that an astringent tightens up tissues and closes off secretions. In a few short words she explained what an astringent does and gave us the basic identification and uses of virtually every member of this one family. She went on to summarize several other families of plants in a similar way.

I was totally dismayed that I had been studying for all those years and no book ever mentioned that there were patterns or any kind of logic to the plant world. In short, this class totally changed everything I ever knew about plants. From there I had to relearn every plant I already knew in a whole new way. I set out to study the patterns in plants, learning to identify the plants and their uses together as groups and families. For the first time I looked at the flower parts and learned to recognize the patterns between related plants. Soon I was able to recognize these patterns even in plants I had never seen before. This quest ultimately led to the writing of my book, *Botany in a Day*, which is now used nationwide in herbal and wilderness schools, even in university botany classes, and especially by thousands of individuals who just want a faster, easier way of learning about plants and their uses. *Botany in a Day* doesn't teach you to memorize every feature of a plant, but it teaches you the two or three critical details that you must know for proper identification.



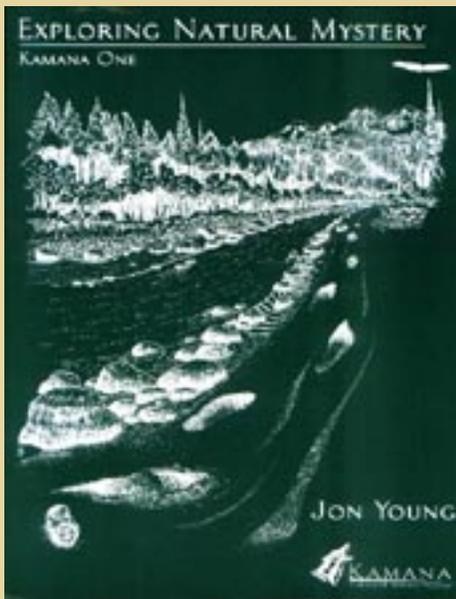
Somewhere along the way I also picked up Kevin Trudeau's Mega Memory home study course, mostly to help me better memorize people, so I wouldn't embarrass myself so often. Trudeau encourages you find distinctive features in a face and associate that with comical, unforgettable images inspired by the person's name. It takes a little practice to get good at doing it well when you are otherwise trying to listen to what a person has to say, but with practice it definitely gets easier. As Trudeau points out, the important thing is that it makes you consciously focus on the person and their name. You will remember the person long after you forget the comical association.

I have never been out and around other people enough to get really good with the associations, but at least it taught me to focus on people's names and faces for the first time in my life. Mostly I practice this skill in my plant classes. I ask all fifteen or so students at the beginning of class to introduce themselves, and I memorize their names and faces as best as I can. It was hard at first because I simply lacked the neural net to do it.

Learning is literally the process of growing new neural connections, so it is just a matter of time to learn to do a skill well. It took me about five years of practice (only a few times each year) before the skill suddenly clicked together. Now it is relatively easy for me to learn new names and faces... as long as I remember to focus on the task. Obviously a skill like this can be immensely useful, both in nature studies and in your social and business life.

Jon Young's Kamana Naturalist Training Correspondence Course

Becoming a naturalist doesn't happen over night. It is a gradual process of waking up to the world around you. You learn about the plants and trees and insects and birds and rocks and animals, and you begin to see things in the world that other people do not notice. Your observations might not be major at first, just little things like, "Gee, that interesting. The deer have been eating the *Agaricus* mushrooms." The more of these little observations you make, the deeper your connection to the natural world becomes.



My training as a naturalist and in primitive skills proceeded haphazardly, learning bits and pieces at random from books or people I met. I did not have any kind of step-by-step instruction book to suggest how to proceed. Some subjects I learned really well, but with other topics, such as learning the concentric rings, I couldn't even find a place to begin.

Through the Kamana Naturalist Training Program, Jon Young and the Wilderness Awareness School have created a step-by-step course that anyone can follow to achieve greater awareness of the natural world. Kamana One is an introductory program which takes about forty-eight hours of time over two weeks to complete. After finishing the assignments you can mail in a report to the Wilderness Awareness School, and if you desire, you may continue with

advanced levels of Kamana. (My book *Botany in a Day* is used in Kamana Three.) Kamana seems to be designed at least partly to meet mainstream concepts of curriculum. In effect, this is a program that you might be able to implement with an entire class in high school, or you might do it on your own for college credit. In fact, the biggest objection to the program is that you might feel like you are back in school, completing homework assignments!

Kamana One includes a variety of awareness exercises, with an emphasis on learning to

make detailed observations. You do not learn a lot of plants or birds, for example, but simply study a few in great detail, learning to memorize every feature until you can see it vividly in your mind's eye. It is essentially the process of developing a "photographic memory". You will use this skill throughout your life to memorize plants, birds, tracks, maps, people's faces, even conversations. As you move through advanced levels of Kamana you learn to journal minute details about every day events, such as each time the wind shifts during the day, every change of the weather, the behavior of the birds and animals, your own moods, what insects are out and about. In short you develop a sort of hyper-awareness about the world around you.

While the benefits of such training are extremely profound, the process of learning it is not. The exercises in Kamana One are surprisingly simplistic, intended to help you break through the normal cloud of distractions to experience the world around you much more clearly.

The *Seeing Through Native Eyes* cassettes are required resources used in conjunction with *Kamana One*. Please scroll down to the end of this page for an on-line order form.

Chris Chisholm's Wolf Journey Part One: Trail of the Naturalist

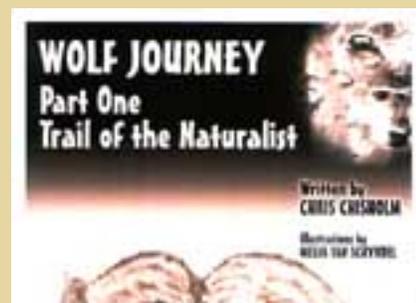
One of the greatest challenges to developing awareness capabilities is that people are always in a hurry, even when going out into nature to slow down. All the animals hide or flee, and we humans are moving too quickly and thinking too much to see them anyway. Therefore, one of the most important skills in nature awareness is learning to just stop and tune into a single place.

A secret spot is a special place you choose to connect with in a very intimate way, returning to it almost daily for a year or more--through sunshine, rain, sleet, or snow, even in darkness. In this time you will study the plants, the animals and their tracks, the birds, the weather, the insect life and soil. Over the course of a year you will learn about your secret spot in great detail, becoming an expert on that place. But it isn't just a matter of learning to identify everything in your surroundings. The key is to be still and quiet enough, and there so often that you become part of the place, accepted by the wildlife that shares it with you.

Finding and using a secret spot is a significant part of John Young's *Kamana Naturalist Training Program*, as well as Chris Chisholm's closely related program, *Wolf Journey: Skills & Stories for the Naturalist*. As Chris writes:

"By consistently studying and observing your chosen area, you will gain perspective on how wildlife interacts around you, and how nature's patterns change with the seasons. If you visit your study site for two consecutive years, your knowledge will multiply many times, as you see patterns repeat themselves.

"Learn the rhythms of the natural world at your secret place,



and you will develop skills to understand how animals, plants, and the elements co-exist. You will see that once you discover the patterns of your study site, you will be able to know other sites more quickly. Often the patterns will be the same elsewhere, but with different individuals playing the roles."



Chris Chisholm has attended a couple courses at Tom Brown's Tracker School, several courses with Jon Young at the Wilderness Awareness School, and he has trained with Frank & Karen Sherwood at Earthwalk Northwest. The Sherwoods were former instructors at Tom Brown's Tracker School, and they helped to edit *Wolf Journey*.

Wolf Journey has much of the same content and flavor as *Kamana One*, especially in terms of sensory awareness and use of the secret spot. One key difference is that *Kamana* emphasizes a prayer-like approach to nature that may be uncomfortable for some, especially when used with groups of people or public schools.

Wolf Journey emphasizes a similar respect for the earth, but through "nature appreciation" as opposed to "honoring the Creator". This is a correspondence course where you purchase only the workbook, with the option of later mailing in your completed assignments and a fee for Chris Chisholm to review your work. As with *Kamana*, there are multiple levels to the *Wolf Journey*, so you can graduate from one level to the next. *Wolf Journey* was beautifully illustrated by Melva van Schyndel. *Botany in a Day* is used as a guide with this workbook. Please scroll down for an on-line order form.

Conclusion

Awareness is the simple but profound act of being conscious of the world around you. It is a matter of knowing where the electricity comes from when you flip on the light switch, what the dog is barking at out in the yard, and where the food on the table came from and how it was grown. Awareness is also about making a connection with the plants and birds and insects and wildlife and geology every place you go. To me it is like living in a world full of friends, and in my daily walks or distant travels I recognize old friends and flowers, some of which I haven't seen in years.

The more you practice awareness skills, the more neural connections you will make, expanding your view of the world and your ability to interpret and evaluate it. Any observation that cannot be understood suddenly requires your personal investigation. You may find yourself plagued with questions, causing you to screech to a stop beside the road, desperate to know what that flower was, or possessed by the need to study the ecology of a particular field or forest.

Instead of switching on the television news and accepting every story as absolute truth from an authority figure, you will recognize certain inconsistencies--that so many stories are based on flawed assumptions. When the news describes desertification from over grazing you will recognize it as desertification from too few animals on the land. When the news describes an energy shortage you will see such a surplus of wasted energy, that

the same supply could profitably meet the needs of twice as many people. When the news describes a horrible crime, you may no longer see the criminal as the cause of the problem, but as the symptom of something more basic about our society and our relationships with each other and the world around us.

Surprisingly, awareness will teach you about yourself more than anything else. You will observe your own patterns of behavior and begin to question those that are less than positive. When someone says that you are being completely unreasonable, you might just stop and realize that they are correct, because you noticed it too. You will begin to discover a new you, and find much more satisfaction in the life you live.

Order Form

Tom Brown: The Tracker	\$7.00	Quantity:
Tom Brown: The Search	\$13.00	Quantity:
Tom Brown's Field Guide to Wilderness Survival	\$13.00	Quantity:
Tom Brown's Field Guide to Nature Observation & Tracking	\$13.00	Quantity:
Tom Brown: Science & Art of Tracking	\$13.00	Quantity:
Jon Young: Seeing Through Native Eyes	\$50.00	Quantity:
Jon Young: Learning the Language of the Birds	\$13.00	Quantity:
Jon Young: Advanced Bird Language	\$50.00	Quantity:
Jon Young: Kamana One Naturalist Training Program	\$25.00	Quantity:
Chris Chisholm: Wolf Journey Part One	\$18.00	Quantity:
Thomas J. Elpel: Botany in a Day	\$25.00	Quantity:

Please Note: The audio tape *Learning the Language of the Birds* is included in the *Seeing Through Native Eyes* series.

Also be sure to see these related pages:

[Birding: Learn to Identify Birds and Interpret Bird Language](#)
[Jon Young Nature Awareness Resources](#)

[An Interview with Tom Brown, Jr. & Larry Dean Olsen](#)

[Return to Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

Jon Young Audio Cassettes

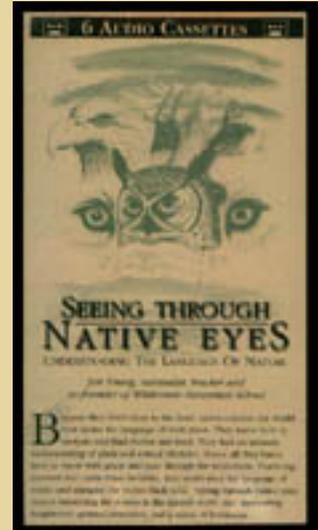
Most books and tapes about nature skills require that you have access to wild lands to hone your abilities. But Jon Young gives you awareness skills for the country or the city. Jon's tapes are especially helpful for hard-working people who have the desire to learn but not much time to spend in the woods. Listening to these tapes on the commute to work will refresh your perception of the world around you. The *Seeing Through Native Eyes* series bears some resemblance to the material presented in the Tom Brown's Field Guides, but through Jon Young's fresh perspective. The tapes are excellent resources for the beginning naturalist.

Seeing Through Native Eyes

Understanding the Language of Nature

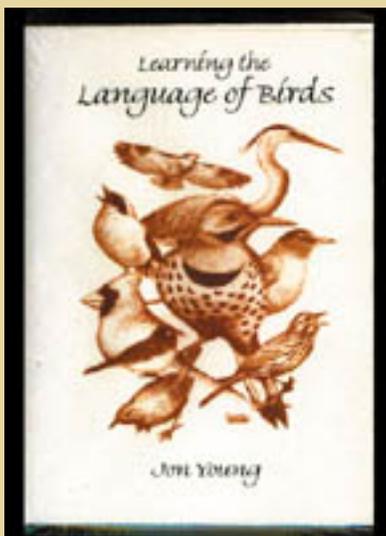
Six Jon Young Audio Cassettes

Because they lived close to the land, native cultures the world over spoke the language of their place. They knew how to navigate and find shelter and food. They had an intimate understanding of plant and animal life-styles. Above all they knew how to move with grace and ease through the wilderness. Practicing routines that made them invisible, they could read the language of tracks and interpret the stories birds told. Seeing through native eyes means immersing the senses in the natural world and discovering heightened spiritual awareness and a sense of belonging.



- #1 Basics: Wilderness awareness , secret spot, tuning the senses.
- #2 Tracking: Learn to interpret nature through the "seven arts of tracking".
- #3 Wandering: Develop a native sense of navigation, plus plant id strategies.
- #4 Community: Honoring the elders and the story-telling tradition.
- #5 Survival: Scout skills, including shelter, water, fire, food, comfort of mind.
- #6 Language of the Birds: Learn to interpret and disarm the forest alarm system.

Seeing Through Native Eyes. Six 90 minute audio tapes. Cost: \$50.00. Please scroll down for our on-line order form.



Learning the Language of the Birds

A Jon Young Audio Cassette

How many times have you surprised a fox at play? Or glimpsed a buck before it saw you? How often have you seen a wild creature eye to eye instead of in retreat? What secret do wild things know that allows them to melt into shadows before we arrive?

For over 25 years, Jon Young, has studied the forest alarm system which allows animals and birds to escape our detection so effectively. In this tape, Jon shares one of the best-kept secrets in nature.

By learning the "Language of the Birds", the listener can begin to disarm the forest alarm system, and can learn to enter the world of nature as a welcome guest. ***Learning the Language of the Birds***. One 90 minute audio tape. Cost: \$13.00. **Please Note:** This audio tape is included in the *Seeing Through Native Eyes* series. Please scroll down for our on-line order form.

Advanced Bird Language

Six Jon Young Audio Cassettes

If you've listened to Learning the Language of the Birds and you want to hear more fascinating tips about interpreting bird language, then you'll be excited about Jon's new six tape series, Advanced Bird Language. His former tape is still the most important one for understanding the basic theory of understanding bird language.

The value of the new series is that Jon puts theory into practice, describing the process of learning and using bird language. Especially helpful are Jon's numerous stories of field experiences where he and others have used bird language to read the forest around them. He gives tangible examples of how disturbances ripple through the concentric rings of nature.



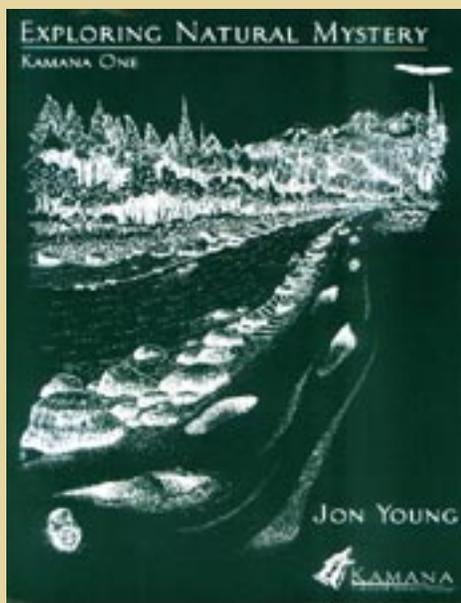
Not all of the tapes are directly related to understanding bird language. Some of the tapes are reminiscent of the Native Eyes series, covering tribal village life and the way of the scout. ***Advanced Bird Language*** Six 90 minute audio cassettes.

Kamana One: Exploring Natural Mystery

Naturalist Training Program by Jon Young

Becoming a naturalist doesn't happen over night. It is a gradual process of waking up to the world around you. You learn about the plants and trees and insects and birds and rocks and animals, and you begin to see things in the world that other people do not notice. Your observations might not be major at first, just little things like, "Gee, that

interesting. The deer have been eating the *Agaricus* mushrooms." The more of these little observations you make, the deeper your connection to the natural world becomes.



Through the Kamana Naturalist Training Program, Jon Young and the Wilderness Awareness School have created a step-by-step course that anyone can follow to achieve greater awareness of the natural world. Kamana One is an introductory program which takes about forty-eight hours of time over two weeks to complete. After finishing the assignments you can mail in a report to the Wilderness Awareness School, and if you desire, you may continue with advanced levels of Kamana. (My book *Botany in a Day* is used in Kamana Three.) Kamana seems to be designed at least partly to meet mainstream concepts of curriculum. In effect, this is a program that you might be able to implement with an entire class in high school, or you might do it on your own for college credit. In fact, the biggest objection to the program is that you might feel like you are back in school,

completing homework assignments!

Kamana One includes a variety of awareness exercises, with an emphasis on learning to make detailed observations. You do not learn a lot of plants or birds, for example, but simply study a few in great detail, learning to memorize every feature until you can see it vividly in your mind's eye. It is essentially the process of developing a "photographic memory". You will use this skill throughout your life to memorize plants, birds, tracks, maps, people's faces, even conversations. As you move through advanced levels of Kamana you learn to journal minute details about every day events, such as each time the wind shifts during the day, every change of the weather, the behavior of the birds and animals, your own moods, what insects are out and about. In short you develop a sort of hyper-awareness about the world around you.

While the benefits of such training are extremely profound, the process of learning it is not. The exercises in Kamana One are surprisingly simplistic, intended to help you break through the normal cloud of distractions to experience the world around you much more clearly. The *Seeing Through Native Eyes* cassettes are required resources used in conjunction with *Kamana One*

Order Form

Seeing Through Native Eyes (six audio tapes)	\$50.00	Quantity:
Learning the Language of the Birds (one audio tape)	\$13.00	Quantity:
Advanced Bird Language (six audio tapes)	\$50.00	Quantity:

Jon Young: Kamana One Naturalist
Training Program \$25.00

Quantity:

Remember: *Learning the Language of the Birds* is included in the *Seeing Through Native Eyes* series!

Also be sure to see these related pages:

[Birding: Learn to Identify Birds and Interpret Bird Language Awareness Books, Tapes, Resources and Perspective](#)

[Return to Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

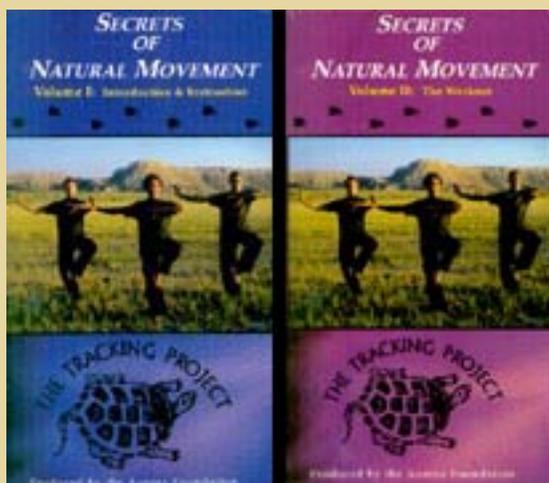
Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
**[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)**

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids



The Secrets of Natural Movement

by John Stokes & Friends

Produced by the Aurora Foundation

The Tracking Project has led thousands of people in workshops set in nature, teaching tracking, survival, and living in the natural world. The Secrets of Natural movement is their workout designed to give you a natural physique--one that emphasizes tendon and connective tissue strength over bulk--aiming for the body of a mountain lion, both graceful and powerful.

The Secrets of Natural Movement draws on the health traditions and martial arts that have taken their inspiration from the animals--Yoga, Taiji, Bagua, and Chi Kung, to name a few. Volume I: Introduction and Instruction takes you step-by-step through each of the moves. Volume II: The Workout connects all the moves into a cohesive workout that you can follow along with. The videos were filmed in the outdoors and are accompanied by soothing didgeridoo and drum music. If you seek to increase your flexibility, balance and endurance for stalking and getting closer to nature, then these tapes can certainly help you reach your goals. Cost: \$35.00.

Secrets of Natural Movement Videos I
& II \$35.00 Quantity:

[Return to Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605

E-mail Contact Page

Thomas J. Elpel's Web World Portal

Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC

Primitive Living Skills | Sustainable Living | Wildflowers & Weeds

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids

Bird Fact: How many birds are killed by collisions with communications towers?

Answer: Biologists with the U.S Fish & Wildlife Service conservatively estimate that 4 to 5 million birds are killed nationwide each year. There are about 74,000 communications towers in this country. Night-migrating birds crash into the towers and support wires on dark, foggy nights. Awareness of the problem has grown in recent years when flocks of up to 10,000 birds were found dead after a single night. Exactly why birds crash into the towers is unknown, but conservationists speculate that they are attracted to the tower lights, which are used to warn aircraft.

Lights in tall buildings pose a similar problem. Night migrating birds seem to be attracted to the lights and fly around until they either crash or drop from exhaustion. Volunteers in Toronto, Canada help patrol city streets on mornings during the migrating season to look for surviving birds that may be revived with rest. Volunteers also founded the [Fatal Light Awareness Program \(FLAP\)](#) to help educate people on the need for reduced lighting on tall buildings.

References:

"*Birds and Towers Don't Mix.*" [Popular Science](#). August 2000. Page 40.

"*Fatal Attraction.*" [Bird Conservation](#). Issue 17. Pages 10-11.

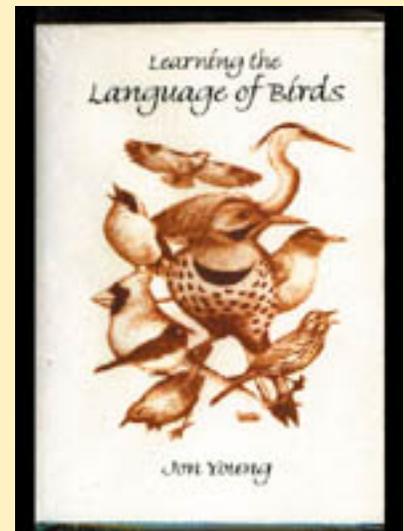
"*Making a Flap.*" [Bird Conservation](#). Issue 17. Pages 10-11.

Birding: Learn to Identify Birds and Interpret Bird Language

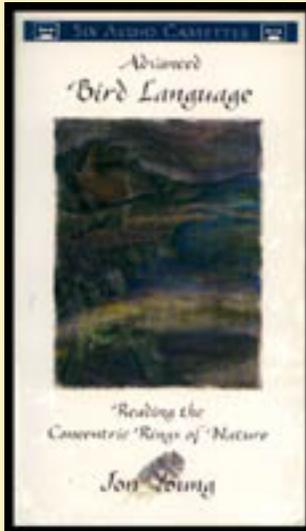
Audio Tapes by John Young

My approach to nature awareness definitely has its roots in Western culture-- I tend to focus my studies on the plants, rocks, birds and other animals that are most "useful" towards achieving my goals. In this case, the goal would be successful primitive wilderness survival living. In other words, I tend to think from my stomach: "Sure it's a cute bird, but can I eat it?" This utilitarian approach to nature may sound alarming and offensive when first exposed, but believe me, you definitely develop a great respect and appreciation for every living thing when you interact with the world this way, instead of just looking at nature and saying, "Gee, isn't that cute."

Besides being illegal to kill song birds (unless you have a communications tower for a weapon), there really isn't any meat on them anyway, just lots of fluff. It is for that reason that I put off seriously studying birds for so long. I knew I wanted to get into birding eventually to round out my nature skills, but I prioritized more "useful" skills first.



Two things helped to shift bird identification to the top of my list. First, I reached a level of satisfaction with my other skills, such as edible and useful plants (i.e.: [Botany in a Day](#)) that made birding seem like the next good skill to develop. Second, and more importantly, I finally learned that it would actually be very "useful" to become proficient in bird identification.



It was Jon Young's tapes, [Seeing Through Native Eyes](#) and especially tape number six of the series, *Learning the Language of the Birds* that really turned me on to birding. On that tape, Jon Young describes the process of deciphering bird songs to discover if there are other animals or people nearby that are beyond the limited range of your own five senses. It isn't a matter of translating any particular bird call into English, but rather of being able to interpret alarm calls based on the intensity of the alarm and the preferred habitat of the bird(s) sounding the alarm. For example, a ground-feeding bird like a robin is going to squawk about threats on the ground--such as a cat--while a tree-top feeding bird like a tanager is going to squawk about threats from the air--such as a hawk. You might have some experience with this process already, for instance, if you know who or what is coming up the road just by the tone of your dog's bark or the wag of it's tail.

In *Learning the Language of the Birds*, Jon Young out-lines a systematic process for distinguishing between normal or "baseline" bird songs versus their alarm calls. In theory at least, it isn't necessary to be able to identify which species of bird is making the call, as long as you know it's preferred habitat (low, middle, or high) in the tree cover. In practice, however, you have to learn at least the most common song birds in your area to develop your skills, then you can extrapolate that information to other species you are not so familiar with.

Jon Young also produced a six-tape series called *Advanced Bird Language*. The former tape, *Learning the Language of the Birds* is still the most important one for understanding the basic theory of understanding bird language. The value of the new series is that Jon Young puts theory into practice, describing the process of learning and using bird language. Especially helpful are Jon Young's numerous stories of field experiences where he and others have used bird language to read the forest around them. He gives tangible examples of how disturbances ripple through the concentric rings of nature.

Learning the Language of the Birds (one audio tape) \$13.00 Quantity:

Advanced Bird Language (six audio tapes) \$50.00 Quantity:

Remember: *Learning the Language of the Birds* is also included in the [Seeing Through Native Eyes](#) series!

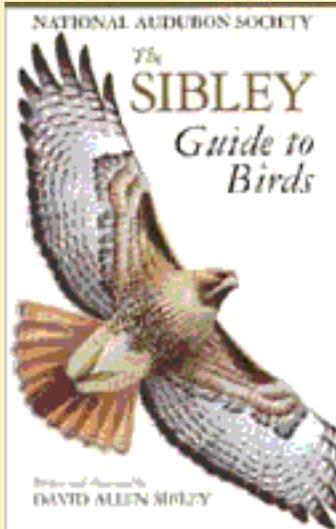
-Please scroll down the page for the "Add to Order" button.-

Bird Identification Books

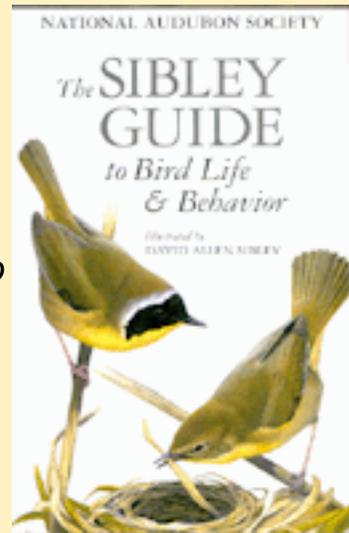
The Sibley Guides

The process of learning to interpret bird language naturally requires some bird identification skills. The easiest time to begin identifying birds is when there are the least of them around to confuse you.

That would be winter here in the northern latitudes. But don't let that stop you from learning birds any time of year. Just start with the most common, most distinctive birds first and work your way gradually towards the LBB's or "little brown birds" that all look alike.



There are many great bird identification books, of which the most comprehensive book is undoubtedly the 544 page National Audubon Society's **Sibley Guide to Birds** by David Allen Sibley. Sibley began studying birds seriously at age 7, under the tutelage of his father. Unlike other guides, the *Sibley Guide to Birds* includes complete descriptions for all 816 bird species found in North America north of Mexico. Most species are pictured at rest and in flight, and from several angles, above



and below. The pictures also show plumage in every stage of development and in both sexes, so you can see the complete range of variations within a species. Also included are descriptions of each bird's distinctive markings, plus range maps and migration routes. The book even includes measurements for the typical wingspan, length, and weight of the birds.

Sibley planned the book for nearly twenty years and produced the fantastic life-like drawings--several thousand of them-- in just five years. One feature I especially like is that, if you are looking for one type of bird, like a warbler, then you can look at scaled down images on a single page covering all possible choices. That makes it easy to compare one species to another without constantly flipping back and forth through the pages. This is the sort of book that is so beautiful and so well organized that it is fun just to sit down and browse through the pages. The only thing lacking in the *Sibley Guide to Birds* is information about bird habits, such as nesting preferences, the number and type of eggs, and dietary choices, etc.... all of which is included in the equally impressive companion book *The Sibley Guide to Bird Life & Behavior*.

The Sibley Guide to Bird Life & Behavior was written with the input of forty-eight expert ornithologists, and it is encyclopedic in its coverage of the birds of North America. The first 120 pages introduce the reader to bird anatomy, evolution, classification, behavior, habitats and conservation. While this part of the text is less-than-exciting, it is useful background information that any birder should be familiar with.

The rest of this 588 page book is dedicated to exhaustive coverage of the bird families of North America, including family traits, taxonomy, adaptations, feeding, breeding, vocalizations and displays, nesting, migration, and conservation. Nowhere else can you find so much information under one cover. The book is illustrated with more of David Allen Sibley's incredible artwork. Owning both of the Sibley Guides is like owning an entire library of bird books!

Sibley Guide to Birds (paperback) \$35.00 Quantity:

Sibley Guide to Bird Life & Behavior
(hardcover) \$45.00 Quantity:

-Discount-

-Order both *The Sibley Guide to Birds* and *The Sibley Guide to Bird Life & Behavior* and save \$5.00.-

-Order both Sibley Guides and all seven of Jon Young's bird language tapes and save \$18.00.-

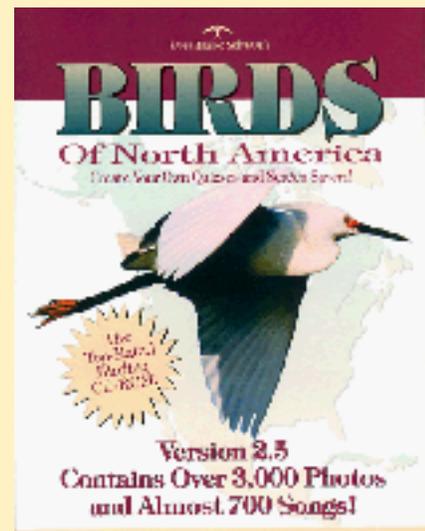
Sibley Guide to Birds + Sibley Guide
to Bird Life & Behavior \$75.00 Quantity:

Sibley Guides 1 & 2 + Language of
the Birds + Advanced Bird Language \$125.00 Quantity:

Bird Identification Software

One nice thing about bird books is that you can easily haul them into the field and use them while you are still looking at the birds. But there are two things about bird identification software that I like even more.

First, programs like the National Audubon Society's *Interactive CD-ROM Guide to North American Birds* have search functions, so that you can enter the season, region, habitat, color and approximate size of the bird you are looking for, and the computer will do a search and return all possible matches. In other words, the computer does the searching work, so you don't have to. Then you can easily compare the possibilities on the screen to find the most likely species.



The second thing I like is that when you have a probable match, or a few possibilities, then you can play each bird's main song and compare them that way too. That's helpful

because you are often trying to identify small birds way up in trees fluttering about so that you never really get a good look at them. If you are unsure from the images, then the song can be the clincher, and that's good practice when you are learning to interpret bird language any way.

Now, I have heard that Thayer's Birding Software [Birds of North America CD-ROM](#) is the best birding program on the market, but it apparently runs only on Windows, not Macintosh, so I don't have any way of testing it. I think that is unfortunate too, because a large percentage of naturalists work on Macs like I do. I think they are losing many potential customers. Anyway, if you have a computer that runs Windows, then you can [click here](#) to order the program from Amazon.

The Audubon Society's [Interactive CD-ROM Guide to North American Birds](#) does run on both Macintosh and older Windows computers, but unfortunately not on Windows 98 or newer systems. Anyway, I absolutely love the program. It took a few sessions to get comfortable with the software, since it doesn't come across very intuitively. But once you figure out how to use the search functions the way I described above, you will find birding greatly simplified and rewarding. And as you learn each new species then you can add it to your own electronic bird list, with the picture and your own notes for future review.

Bird Files: How do homing pigeons and migratory birds navigate?

Answer: Possibly by "infrasound" or "very low frequency sound", according to geophysicist Jon Hagstrum of the US Geological Survey. Hagstrum has been studying homing pigeons, which are able to find their way home from thousands of miles away as easily as if they were following a map. Hagstrum theorizes that the birds may be building "topographic sound maps" based on the distinctive, but very low frequency sounds of things like ocean waves, waterfalls, or the wind whistling over the mountains, plains, or cities.

Lab experiments show that pigeons are sensitive to infrasounds, but do not indicate why. Hagstrum researched pigeon races where thousands of birds were released at once to race home. Four races were distinctive because the birds were either hopelessly late or failed to return at all. In each case the races coincided with nearby flights of the concorde. Hagstrum speculates that the sonic booms temporarily deafened the birds, knocking out their ability to map the landscape. Bird behavior is noticeably altered just prior to major earthquakes too, and Hagstrum speculates that also may be due to infrasound. Infrasound may explain how other migratory birds, monarch butterflies and even whales navigate.

Source: Josie Glausiusz. *"The Bird on the Plain Flies Mainly With the Brain."* [Discover](#). March 2000. Page 24.

Also be sure to see these related pages:

Awareness Books, Tapes, Resources and Perspective

Jon Young Nature Awareness Resources

Return to Nature, Wildlife & Tracking Guides



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
E-mail Contact Page

Thomas J. Elpel's Web World Portal
Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

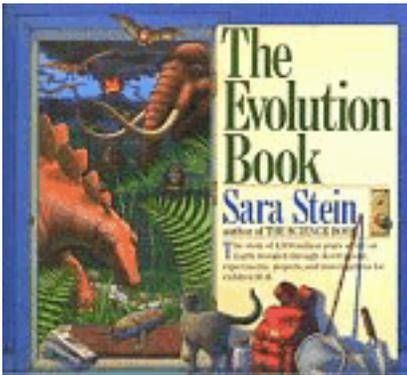
Granny's Country Store Departments
Tom's Books & Videos
Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids

The Evolution Book

By Sara Stein

Reviewed by Thomas J. Elpel

I really like *The Evolution Book* by Sara Stein because she makes the process of evolution so accessible to the lay person. You get the whole story of life on earth from the first bubbles in the soup up to where we are now. It is like a slide show through time, outlining evolution of the major life forms on earth, past and present. As needed, Stein introduces basic geology, plate tectonics, botany and chemistry, always in clear and concise language. The science of our past is no longer a mere abstraction preached in stuffy classrooms, but something you can truly connect with in the real world. It is the kind of book I dreamed of writing myself, but it would have taken me a decade of research and writing to do it as well as Stein did.



The Evolution Book could be described as a "Junior Encyclopedia of Evolution". It is thorough and clearly written, but not the kind of book that kids are going to pick up and read for entertainment. The author rated the text for children ages 10-14, but it is far more appropriate experienced jointly with parents or teachers.

Given the lack of science training in America, this "children's book" is appropriate reading for most adults as well, especially for anyone who has not been exposed to evolutionary thinking

since high-school.

Throughout *The Evolution Book* there are also side-bars filled with interesting trivia, plus activities for kids. I seldom like that format, but Stein pulled it off nicely in this text. The side-bars add spice and interest without distracting the reader from the primary purpose of the book. Given my own background in primitive skills, I really appreciate the experiential bias of some of the activities: eating sea weed, skinning roadkill animals (with precautions), tanning hides, cooking wild plants, and so forth.

The only thing better than *The Evolution Book* might be "The Evolution Multimedia DVD" with movies, narration, and the ability to click anywhere in the text to access additional details to whatever depth is desired by the user. I hope someone is working on that already. But until then, there is this great book at a great price. *The Evolution Book*. ISBN: 0-89480-927-X. 1986. 389 pages. **Cost: \$12.00.**

The Evolution Book \$12.00

Quantity:

[Return to Nature, Wildlife & Tracking Guides](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
**[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
**[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
**[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)******

Granny's Country Store Departments
[Tom's Books & Videos](#)
**[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
**[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)****



HOPS Press, LLC

Thomas J. Elpel's
Web World Portal



Granny's Country Store

Tom's Books & Videos

Primitive Wilderness Survival

Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books

Green Goods for the Home

Books & Gifts for Kids

HOPS Press, LLC

Self-Service

Instant Wholesale Discounts

Primitive Living Skills

**Hollowtop Outdoor
Primitive School, LLC**

Tom's Journals

Skills Articles

Directory of Schools

Sustainable Living

Alternative Construction

House-Building Classes

Articles & Resources

Ecological Economics

Wildflowers & Weeds

Plant Identification

& Edible Plants

Rangeland Ecology

Weed Control Alternatives

Society of

Primitive Technology

Bulletin of Primitive

Technology

On-line Articles

Subscription Information

3Rivers Park

A Place for People

Help us Secure the Rivers!

What's New?

See what's new
on all our websites!

HOPS Press, LLC

website orders

are processed by:

Granny's

The Art of Nothing Wilderness Survival Video Series

Video companions to the book

Participating in Nature: Thomas J. Elpel's Field Guide to Primitive Living Skills

Also based on the article The Art of Nothing by Thomas J. Elpel.

Have you ever dreamed of being able to walk out into the woods to survive with nothing but the clothes you have on? You are not alone. In a society that is very disconnected from the natural world, many individuals find themselves wondering about what lies beyond the pavement. We know that our ancestors lived by their bare hands and wits alone, but how did they do it? How would you do it? What would it be like to be so connected with the natural world that you could just leave everything behind and walk away into the woods? It is easier than you might expect.

You might think you would need to take a lot of classes and learn a gazillion skills to survive, but the real secret is in knowing how not to need very many skills at all. For example, if you've made a bowdrill fire set with a steel knife, you may wonder how to make a set without a knife. So how do you make a good enough stone knife to work wood as nicely as your steel knife? *You don't*. By breaking sticks and abrading them on rocks you can make a completely serviceable bowdrill set without the need for a fancy knife at all, as you will see in Volume One of the *Art of Nothing Wilderness Survival Video Series*.

But you won't get just a laboratory-style skills demonstration in these videos. Instead, Thomas J. Elpel and his special guests take you camping in the real world and connect the dots, demonstrating how each of these skills are applied together to meet your basic needs of shelter, fire, water, and plant and animal foods. Also included in the videos are wild mushrooms and unique tools and cooking techniques, plus great scenery and wildlife footage, so you really get a multi-dimensional sense of the skills *and* the place.

Each video takes place in a different setting in different seasons, with Thomas J. Elpel and his guests demonstrating completely different skills to meet their basic needs. *The Art of Nothing Wilderness Survival Videos* are recorded on **certified quality recycled VHS tapes** for an environmentally friendly product!

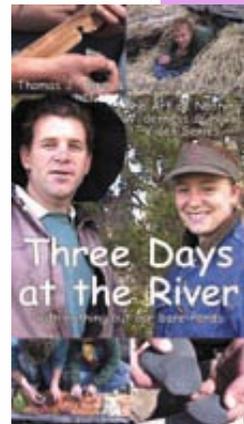
Volume One

Three Days at the River

with nothing but our bare hands

No knife. No matches. No food, sleeping bags or other gear. Join Thomas J. Elpel and 13 year-old daughter Felicia for this extraordinary primitive camping experience in southwest Montana. In the cottonwoods along the Jefferson River they demonstrate all the skills required to meet their basic needs, starting with nothing but their bare hands. Skills include:

- **Shelter:** Grass sleeping bag on hot ground.
- **Fire:** The cottonwood root bowdrill set.
- **Water:** Boiling water in found bottles and cans for purification.
- **Edible Plants:** Cattail Roots, stinging nettles, rose hips, burdock, mustard greens and milkweed shoots.
- **Fungi:** The edible tree mushroom.



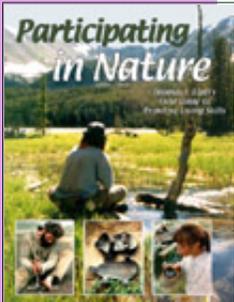
Country Store

PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

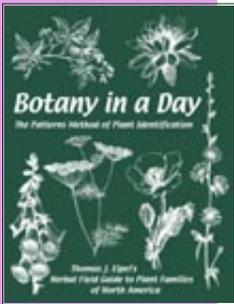


This Website Created on a lovable
[Macintosh](#) computer!

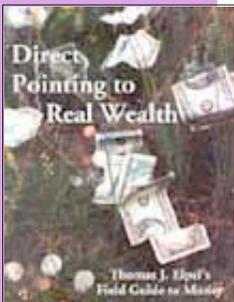
Books authored by
Thomas J. Elpel



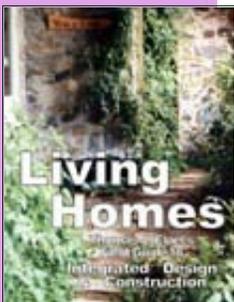
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing
to Real Wealth](#)



- **Meat:** Porcupine--killing, skinning, butchering.
- **Cooking:** Shishkebabs and hot rock stir-fry.
- **Tools:** Discoidal stone knives and digging sticks.

3 Days at the River. ISBN: 1-892784-11-4. May 2002. 91 Minutes. \$25.00

International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *Three Days at the River* is only available in NTSC format.

Tom,

Received my video (3 Days at the River) last week, and I had to write to tell you it was very entertaining and educational. I'm a firm believer in your "art of nothing" philosophy. It is about time someone promotes that type of thinking toward outdoor recreation.

*Walk in Beauty,
Zak Baker
(used with permission)*

Art of Nothing: 3 Days at the River \$25.00

Quantity:

-Please scroll down the page for the "Add to Order" button.-

Volume Two Mountain Meadows

camping with almost nothing but the dog

With little more than stone knives and the dog, Thomas J. Elpel and cousin Melvin Beattie venture into the Rocky Mountains to survive with whatever they can find and improvise from their surroundings. Among the wildflowers, wildlife and scenic meadows of southwestern Montana, they demonstrate all the skills needed to meet their basic needs, including:

- **Shelter:** A debris shelter with hot rocks.
- **Fire:** The mullein on sage handdrill set.
- **Water:** Purifying water with Aerobic Oxygen.
- **Edible Plants:** Sweet cicely, wild sunflower, dwarf huckleberry, musk thistle stems and "artichokes", brook saxifrage, rose petals.
- **Meat:** Ground squirrels--killing, skinning, butchering.
- **Cooking:** Cooking on an upright rock slab.
- **Tools:** Glass-knapped knives & the jo stick.

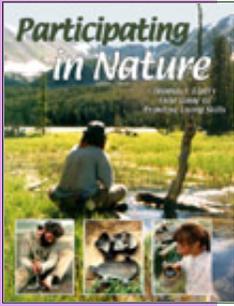


Mountain Meadows. ISBN: 1-892784-13-0. July 2002. 90 Minutes. \$25.00

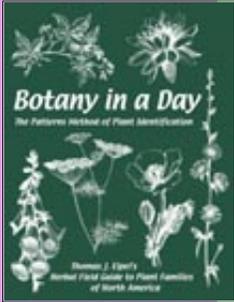
International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *Mountain Meadows* is only available in NTSC format.

Hi Tom & Renee,

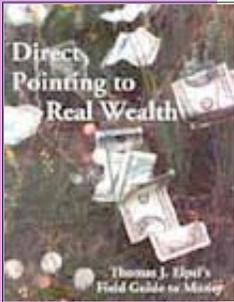
Living Homes



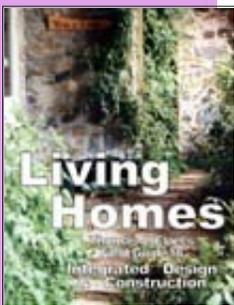
Participating in Nature



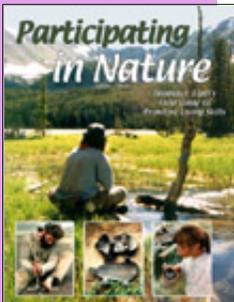
Botany in a Day



Direct Pointing to Real Wealth



Living Homes



Participating in Nature

I have received your videos 3 Days at the River + Mountain Meadows. Fantastic work!!! They are two of the best videos I have ever seen. You did a great job, and I can't wait until you do more.

*Thank You,
Ted Barber
(used with permission)*

Dear Tom,

I recently purchased two videos that you produced (3 Days at the River and Mountain Meadows). I guess because of my background, I more/less have the same philosophical approach to the learning and teaching of these skills - from that of a naturalist. As such, I extend to you "a job well done". I look forward to more of them.

*Take Care.
Ray Vizgirdas
Fish and Wildlife Biologist
(used with permission)*

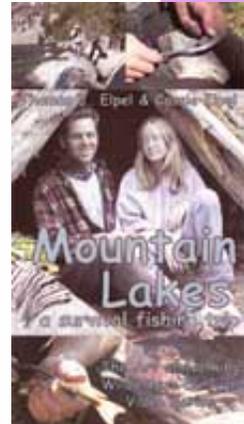
Art of Nothing: Mountain Meadows \$25.00 Quantity:

-Please scroll down the page for the "Add to Order" button.-

**Volume Three
Mountain Lakes**
a survival fishing trip

With little more than a flint & steel kit and a copper drinking cup, Thomas J. Elpel and daughter Cassie trek five miles back into the Rocky Mountains for a few days of fishing, fun, and survival living. Among the spectacular lakes and mountain peaks, they demonstrate all of the skills require to meet their basic needs, including:

- **Shelter:** Rock and log shelter with a fire.
- **Fire:** Flint & Steel Kit + Making char cloth.
- **Water:** Drinking from mountain streams.
- **Edible Plants:** Wild onions and glacier lilies.
- **Meat:** Mountain Suckers-fishing by hand, snagging by hook, plus fishing laws.
- **Cooking:** Cooking fish on hot coals, plus steaming wild vegetables in a stone oven.
- **Tools:** Tin can knives, plus forging the nail knife and making a pine bark pot.

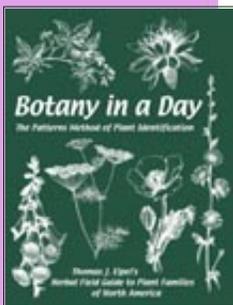


Mountain Lakes. ISBN: 1-892784-14-9. July 2003. 104 Minutes. \$25.00

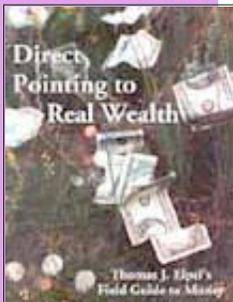
International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *Mountain Lakes* is only available in NTSC format.

Art of Nothing: Mountain Lakes \$25.00 Quantity:

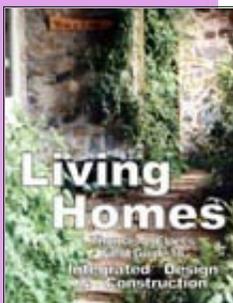
**Discount: Order all three
Art of Nothing Wilderness Survival Videos and save \$15.00.**



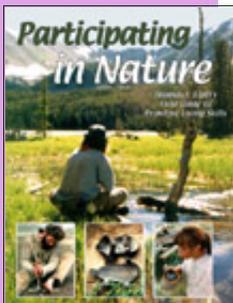
[Botany in a Day](#)



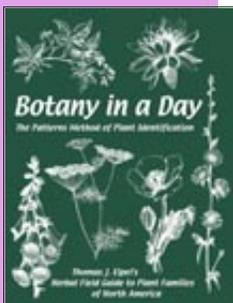
[Direct Pointing to Real Wealth](#)



[Living Homes](#)



[Participating in Nature](#)



[Botany in a Day](#)

All Three Art of Nothing Videos (Save \$15) \$60.00 Quantity:

When will Volume 4 in the Art of Nothing Series be out?
Probably not until December 2004 at the earliest.
We have our hands full with a lot of other projects right now!

Return to [Books & Videos by Thomas J. Elpel.](#)
Return to the [HOPS Press, LLC Home Page.](#)



How to Place Retail Orders

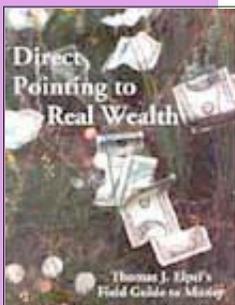
[\(Click here for Wholesale Orders.\)](#)

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

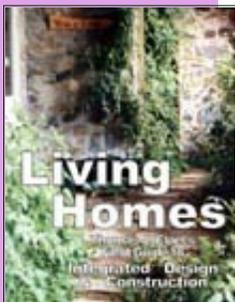
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)



Direct Pointing to Real Wealth



Living Homes

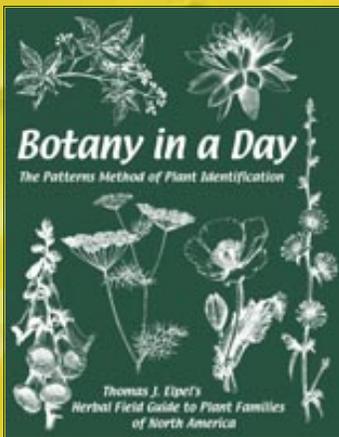
An Easier Way to Identify Plants

By Thomas J. Elpel

The study of botany is the study of patterns in plants. Related plants have similar characteristics, and botanists have placed them in groups according to these patterns of similarity. In essence, botanists have created a filing system where all plants with one pattern are placed in one file folder, all the plants with another pattern are placed in another folder, and so forth. The better you can recognize these patterns, the better you will be able to identify plants.

Unfortunately, very few people know about these patterns when they start identifying plants. Most people pick up a book of color photos and flip through hundreds of pages of pictures hoping to find a match. When they finally find a possible match, then they may not know the specific parts well enough to determine if they have the correct answer or something totally unrelated that looks superficially similar.

On the other hand, many people take college courses and learn to use a flora with a key. This method can require hundreds of hours of training to memorize all the botanical terms. The tedium of the process can stifle the enthusiasm of even the most enthusiastic nature-lovers. Ironically, to become proficient with a botanical key ultimately requires at least some knowledge of plant classification, and therefore plant patterns. Yet, these patterns are often presented almost as an after-thought, if at all.



Botany in a Day: The Patterns Method of Plant Identification presents a more holistic approach to learning about plants that starts with an overview of the botanical filing system. Learn how and why the filing system is organized the way it is, and learn to recognize the patterns among related plants. **Botany in a Day** shows how related plants have similar characteristics for identification and often similar uses. It takes you from the top down through the plant kingdom to plant families, but it does not include a key below the family level.

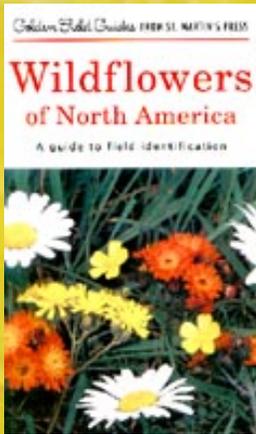
When you know these basic patterns, then you will recognize something about a new plant, even before you know its individual name. In many cases, you will only need to identify the family pattern to know the edible and medicinal properties of your plant specimen.



Most of the key patterns presented in *Botany in a Day* can be observed with the naked eye, assuming you have normal vision. However, some of the smaller flowers will require the use of a **botanical loupe** or lens (also known as a geology loupe, jeweler's loupe, or diamond loupe). You may also need a loupe for observing minute flower parts when identifying individual species within a family.

It is much easier to identify the proper genus or species of a plant after you have accurately identified the proper family. Use *Botany in a Day* to find the correct family, then you can use color picture books to help narrow down choices. Just be sure to use a wildflower guide that is organized by families. Those that are organized by habitats or colors of the flowers will ultimately hinder your progress.

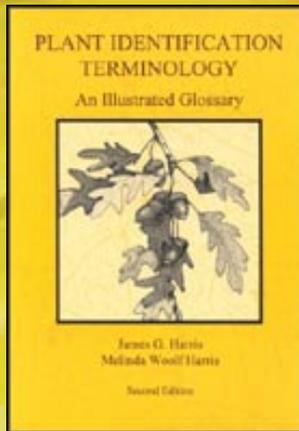
My favorite companion guide to *Botany in a Day* is the **Golden Guide to Wildflowers of North America: A Guide to Field Identification**. Use *Botany in a Day* to determine the proper family, then you can turn to that family in the *Golden Guide* and flip through a few pages to find a match. I use other local picture books as well (pictured farther down the page) but I've been constantly amazed wherever I go to find the flowers I am looking for included in this little



book.

With the *Golden Guide* I can usually find the correct genus, and sometimes it is possible to pin down the exact species. If I need the species information, and I am not able to determine it from my *Golden Guide* or any of my other wildflower books, then I finally turn to a **local flora** with a botanical key. You could start at the beginning of the key, and progress through it to the proper family, genus and finally the species, but it is a lot easier to get to your final answer if you short-cut the process with the aid of *Botany in a Day* and books like the *Golden Guide*, then use the local flora to go only from the genus down to the correct species.

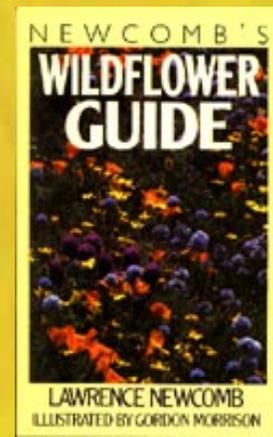
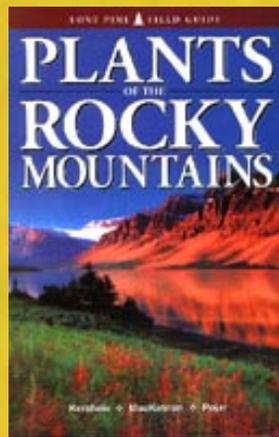
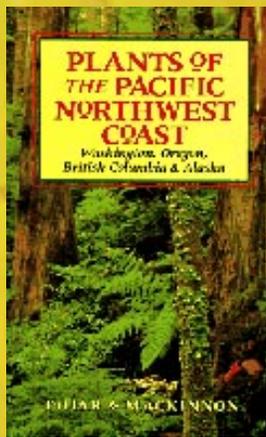
Yes, you will need to know the botanical nomenclature to get through the key, but it isn't such a daunting task when going through only a few lines of text. I recommend using the book **Plant Identification Terminology: An Illustrated Guide** to help you understand the terms in the key. You will find it amazingly easy to key out flowers by using all of these books together, compared to trying to do it using only a botanical key.



Botany in a Day	\$25.00	Quantity:
20x Botanical Loupe	\$17.00	Quantity:
Golden Guide to Wildflowers of North America	\$14.00	Quantity:
Plant Identification Terminology	\$19.00	Quantity:
Botany Bonus Pack (All four items above--Save \$10.00)	\$65.00	Quantity:

-Please scroll down the page for the "Add to Order" button.-

Other Regional Companion Books to Botany in a Day



Plants of the Pacific Northwest Coast \$20.00

Quantity:

Plants of the Rocky Mountains \$20.00

Quantity:

Newcomb's Wildflower Guide (intended
for NE states) \$19.00

Quantity:

[Return to Plant Identification & Ecology Resources](#)

[Return to Granny's Country Store](#)

[Return to the Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store

PO Box 684

Silver Star, MT 59751-0684

406-287-3605

[E-mail Contact Page](#)

[Thomas J. Elpel's Web World Portal](#)

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

[Granny's Country Store Departments](#)

[Tom's Books & Videos](#)

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids

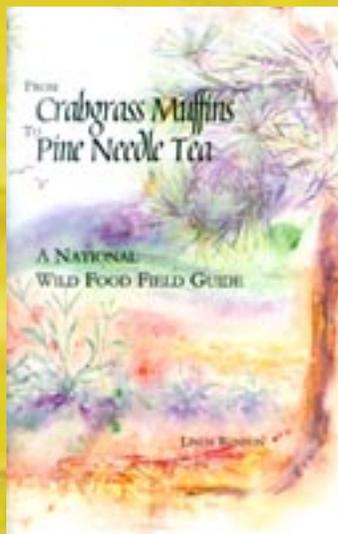


From Crabgrass Muffins to Pine Needle Tea

A National Wild Food Field Guide

by Linda Runyon

Review by Thomas J. Elpel



There must be thousands of edible wild plants books on the market. At first glance, I thought this book, *From Crabgrass Muffins to Pine Needle Tea* was yet another text covering the same range of plants with the same kind of coverage as every other wild edible plants book. But something caught my eye and I read a little deeper, and then a little deeper still.

The difference with this edible plants book is 1) the author, Linda Runyon lived primitively and foraged for the majority of her food for thirteen years, and 2) as a vegetarian she was truly dependent on wild edible plants for survival and sustenance. One hour spent reading just part of Runyon's book completely changed my view of what's edible and how to truly live off of wild edible plants... and I've been studying wild edible plants for more than twenty years!

The way I learned it, there are relatively few wild plants that could truly sustain a person. Sure the wild salad plants are good for you, but to *survive* you needed wild foods with lots of carbohydrates, oils and calories-- and those are often few and far between. But Linda Runyon managed to survive by turning salad plants into real food--such as drying and grinding wild clovers and grasses into flour. There is protein in these plants, just like beans and grains, and Runyon proved that you can really live off of them. It has given me a wealth of new ideas to explore.

From Crabgrass Muffins to Pine Needle Tea covers common plants that are found nationwide. The book includes line drawings and color photos for identification, plus recipes, nutritional information, tips for cultivation, and a section on poisonous look-a-likes. The price tag is twice as much as you would expect for a book of this type, but worth it for the fresh ideas. *From Crabgrass Muffins to Pine Needle Tea* ISBN: 0936699-07-8. 2002. 268 pages. Cost \$34.00.

From Crabgrass Muffins to Pine Needle
Tea \$34.00

Quantity:

-Please scroll down the page for the "Add to Order" button.-

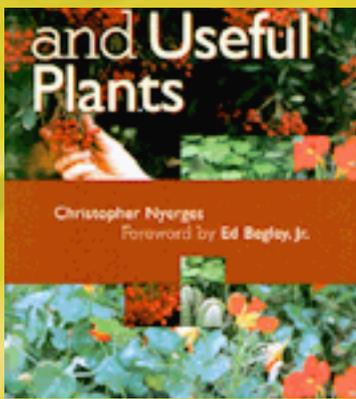
Guide to Wild Foods and Useful Plants

by Christopher Nyerges

Review by Thomas J. Elpel



Although Christopher Nyerges' book *Guide to Wild Foods and Useful Plants* is intended for trail use, I find it fascinating just to sit and read. Nyerges has been leading Wild Food Outings since



1974, and his book is packed full of stories and advice based on personal experiences. For example, he is one of a growing number of people who eat poison oak/poison ivy to build and maintain an immunity to it. (Eating poison ivy is not something you should run out and try on a whim, since an adverse reaction could cause your throat to swell shut. Read this book first!) In his book Nyerges describes his own positive experience with eating poison oak, and he offers tips for those without immunity to treat their symptoms.

The *Guide to Wild Foods and Useful Plants* covers the key edible and poisonous plants of California and the desert southwest. The book includes black and white photos to aid in identification. *Guide to Wild Foods and Useful Plants*. ISBN: 1-55652-344-0. 1999. 238 pages. Cost \$15.00.

Guide to Wild Foods and Useful
Plants \$15.00

Quantity:

-Please scroll down the page for the "Add to Order" button.-

Exploring Common Useful Plants of the U.S.

video by Christopher Nyerges

Review by Thomas J. Elpel

Christopher Nyerges' video *Exploring Common Useful Plants of the U.S.* serves as an excellent introduction to edible and useful plants common across the North American continent. The video was filmed in a wetland preserve in the Los Angeles area that was once a Native American village site, and Nyerges helps connect the viewer with the historical past within the urban wilds. In watching this video I get the sense that the wild edible and utilitarian plants are the quiet ghosts of another people and an earlier civilization. Nyerges brings these ghosts to life, demonstrating how the plants were used for food and medicine, and how they can still be used today.



Unlike many wild plants videos I've seen, this one is fast-paced and interesting to watch. Nyerges doesn't go into any great depth with the plants, but simply puts forth the message that the plants-- and the lands they grow in-- are immensely valuable and worth preserving. Throughout this plant walk he gathers samples of plants for a wild meal. At the end he demonstrates starting a fire with a handdrill set and preparing a meal from wild plants. This is a nice video for classroom use and for those wanting a first glimpse of what really exists beyond the beaten paths. Christopher Nyerges: *Exploring Common Useful Plants of the U.S.* 54 minutes. Cost: \$20.00.

International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out.

For our European customers we may be able to special order PAL format. Please send an e-mail to us through our [E-mail Contact Page](#) to inquire.

Exploring Common Useful Plants of the U.S. (video) \$20.00 Quantity:

[Return to Plant Identification & Ecology Resources](#)

[Return to Granny's Country Store](#)

[Return to the Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

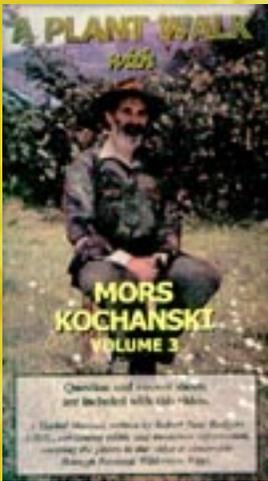
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)

Books & Gifts for Kids



Plant Walk Videos Videos with Mors Kochanski



The Mors Kochanski Plant Walk Series includes seven volumes covering 240 species of plants, plus a master tape for a quick review of them all. As usual, the quality of the information in Kochanski's videos is quite good. I've been studying plants for nearly twenty years, but still found many new and good ideas.

The challenge is to make a video about plants that is also interesting and captivating to watch. The ideal plant video should be produced on DVD, so that the viewer could plug the disk into a computer and go directly to the plant of interest.

As far as plant videos go, these are not too bad. Plants are typically featured in series of seven, followed by review sections to help you remember what you watched. Common and Latin names are given on the video. Also included are question and answer sheets to aid in the review process. I recommend using these videos with [Botany in a Day](#). Look up the Latin names from the video in the index of *Botany in a Day* to learn the family information.

IMPORTANT NOTE: DO you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. For our European customers we may be able to special order PAL format. Please send an e-mail to us through our [E-mail Contact Page](#) to inquire.

Range of Plants Covered: These videos were filmed in western Canada. As with any plant book or video you will find many of the species, or close relatives, over much of the continent. To figure if these tapes are right for you, consider these three factors: **cold winters, humid air, and western location.**

If the place you live matches all three of these factors then you will likely find **90%** or more of the plants discussed. If your place matches two of these factors (for example: cold, humid and eastern **or** cold, dry and western), then you will likely find about **60%** of these plants in your area. If your place matches only one factor (for example: warm, dry, western) then you will likely find about **30%** of these plants in your area. The plants covered in each video include, by common name:

Volume 1

Silverweed, Marsh Hedge Nettle, Plantain, Brown-Eyed Susan, Yellow Ladies Slipper, Meado Buttercup, Alpine Bistort, Pink Pussytoes, Cream-Colored Peavine, Purple Vetch, Canada Thistle, Arrowleaved and Palmated Coltsfoot, Sundew, Round Leaf Orchid, Caraway, Ox-Eye Daisy, Wire Rush, Macoun's Buttercup, Heart-Leaved Alexanders, Blue-Eyed Grass, Common Red Paintbrush, Alpine Milk-Vetch, Bear Root, Western

Wood Lily, Wild Lily-of-the-Valley, Smooth Fleabane, Purple Avens, Drummond's Thistle, Mealy Primrose, Balsaam Groundsel, Northern Green Bog Orchid, Elephant's-Head, Pink Pyrola, Bunchberry and Fireweed.

A Plant Walk with Mors Kochanski
Volume 1 \$20.00

Quantity:

Volume 2

Death Camas, Wood Betony, Alpine Rock Jasmine, Cusick's Paintbrush, Yellow Columbine, Lance-Leaved Stonecrop, Alpine Goldenrod, Monkshood, Moss Champion, Wolly Lousewort, Marsh Valerian, Tall Larkspur, Shooting Star, Field Chickweed, Alpine Pussytoes, Sheep Sorrel, Sweet Grass, Showy Locoweed, Yellow Rattle, Short Beaked Agoseris, Elk Thistle, Yellow Mountain Avens, Common Bladder Champion, Northern Gentian, Richardson's Geranium, Tall Jacob's Ladder, Smooth Blue Beardstongue, Pasture Sagewort, Toad Flax, Tansy, Timothy, Quack Grass, White-Red-and Alsike Clover, Stiff Club Moss, Ground Pine and Yarrow.

A Plant Walk with Mors Kochanski
Volume 2 \$20.00

Quantity:

Volume 3

Water Smartweed, Nodding Beggarsticks, Rough Hair Grass, Water Arum, Small Fruited Bulrush, Marsh Marigold, Marsh Cinquefoil, Canada Anemone, Calla Lilly, Buckbean, Marsh Skullcap, Tule Reed (Great Bullrush), Giant Burreed, Floating Bog, Common Cattail, Bulbiferous Hemlock, Water Parsnip, Water Hemlock, Rat Root (Sweet Flag), Cow Parsnip, Western Dock, Blue Columbine, Veiny Meadow Rue, Western Canada Violet, Strawberry, Dewberry, Stinging Nettle, Mackenzie's Hedysarum, Wild Sarsaparilla and Blue Bells.

A Plant Walk with Mors Kochanski
Volume 3 \$20.00

Quantity:

Volume 4

Nodding Onion, Common Greater Burdock, Fringed Aster, Pasture Sage, Rabbitbrush, Goat's Beard, Baby's-Breath, Old Man Sage, Prickley Pear, Curly Cup Gumweed, Tufted White Praire Aster, Giant Wild Rye Grass, Three Tip Sagebrush, Common Mullein, Spreading Dogbane, Gromwell or Yellow Puccoon., Wolf Lichen, Pearly Everlasting, Hooded Ladies Tresses, Pink Pyrola, Spotted Knapweed, Bull Thistle, Greater Northern Aster, Skunk Cabbage, Self Heal, False Box, False Hellebore, False Solomon's Seal, Sweet Scented Bedstraw, Eyebright, Wild Catnip and Fairy Bells.

A Plant Walk with Mors Kochanski
Volume 4 \$20.00

Quantity:

Volume 5

Buckbrush, Snowberry, Bracted Honeysuckle, Twining Honeysuckle, High Bush

Cranberry, Red Raspberry, Buckbrush, Red Osier Dogwood, Bebb's Willow, Alder, Laborador Tea, Bog Rosemary, Northern Gooseberry, Northern Black Current, Pin Cherry, Choke Cherry, Saskatoon, Bob Birch, Yellow Witch's Broom, White Spruce, Black Spruce, Spruce Resin, Balsam Fir, Balsam Fir Cones, Tamarack.

A Plant Walk with Mors Kochanski
Volume 5 \$20.00

Quantity:

Volume 6

Limber Pine, Western Hemlock, Western Red Cedar, Douglas Maple, Hazelnut, Western Mountain Ash, Englemann Spruce, Sub Alpine Fir, Dwarf Birch, Shrubby Cinquefoil, Yellow Mountain Heather (Heath), Hoary Willow, Buffalo Berry, Pink Spirea, White Admiral (Butterfly), Thimble Berry, Red Elderberry, Spiny Wood Fern, Goat's Beard, Bracken Fern, Red Osier Dogwood, White Spruce, Pear-Shaped Puffball, Ponderosa Pine, Black Hawthorn, Oregon Grape, Snowberry, Prickly Rose, White Virgin's Bower and Great Burdock, plus a special section to distinguish between the cones of Limber Pine, Lodgepole Pine, Jack Pine, Tamarack, Ponderosa Pine, Fir, Balsam Fir, White Spruce, Black Spruce and Englemann Spruce .

A Plant Walk with Mors Kochanski
Volume 6 \$20.00

Quantity:

Volume 7

Aspen, Choke Cherry, Dogbane, Common Juniper, Devil's Club, Baneberry, Paper Birch Spider, White Poplar and Black Poplar, Aspen Conk, Aspen Stocking Moss, Aspen Burl, Fire Killed Lodgepole Pine, Ants in Lodgepole Pine, Woodland Agaric, Belted Conk, Fairy Stool, Aspen Rough Stem, Field Mushroom, Fluted White Elfin Saddle, Brown Cup, Grasshopper, Smoky Polypore, Aspen Rough Stem, Sketch Pad Fungus, Orange Jelly, Delicious Lactarius, Low Bush Cranberry, Crowberry, Prickly Wild Rose, Mountain Cranberry and Small Bog Cranberry, Hemp Nettle, Red Elderberry and Stinging Elderberry, Wolf Willow, plus a group identification.

A Plant Walk with Mors Kochanski
Volume 7 \$20.00

Quantity:

The Master Tape

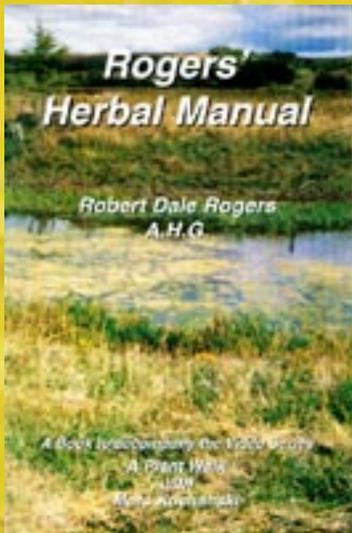
The Master Tape is intended to for review purposes, to test your knowledge and to help you remember all of the plants covered in the seven volumes. All 240 plants are shown as slides in this video, shown for ten seconds each the first time and for less than three seconds each the second time. The common and Latin names of all the plants are included on printed sheets with the video.

A Plant Walk with Mors Kochanski--The
Master Tape \$20.00

Quantity:

**All 7 Kochanski Plant Videos + the
Master Tape (Save \$20.00) \$140.00**

Quantity:



**Rogers' Herbal Manual: Companion Book to the Mors
Kochanski Plant Videos** by Robert Dale Rogers, A.H.G.

Roger's Herbal Manual is designed to accompany Kochanski's Plant Videos. Hence, there are no pictures or descriptions in the book, just lots of details on the properties and uses of the plants that cannot be adequately covered on film.

Rogers' Herbal Manual Companion
Book \$22.50

Quantity:

See also [Dining On The Wilds Edible Plant Videos](#)

Return to [Plant Identification & Ecology Resources](#)

Return to [Granny's Country Store](#)

Return to the [Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

**Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684**

406-287-3605

E-mail Contact Page

Thomas J. Elpel's Web World Portal

Granny's Country Store

HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC

Primitive Living Skills | Sustainable Living | Wildflowers & Weeds

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

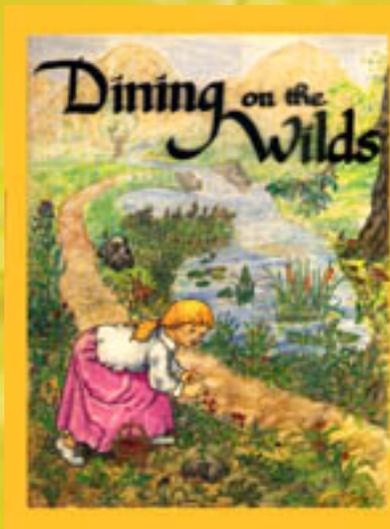
Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

Books & Gifts for Kids

Dining On The Wilds

with Miriam Darnall-Kramer & John Goude



The quality of primitive skills and edible plants videos varies widely. Some videos have really good information, but they would almost kill you with boredom. Other videos are fun to watch, but not terribly informative. The challenge is to make a video that both educational and captivating to watch. The *Dining On The Wilds* videos have mostly good informative content, but not a very exciting presentation of it. Personally, I would prefer to read it from a book. However, if you are a person who learns better from the video format, then these tapes are for you.

The Dining On The Wilds videos includes six tapes covering more than 300 species of plants. Although there is a definite slant towards southern California plants, Kramer and Goude do a nice job of representing the most important edible plants all across North America. Also included is the 167 page *Dining On The Wilds Reference Manual* by Miriam Kramer. One of the greatest assets to these videos is the demonstrations of skills like threshing grain, acorn processing, primitive cooking, harvesting prickly pear cactus, and harvesting cattails. I recommend using these videos with [Botany in a Day](#). Look up the names from the video in the index of *Botany in a Day* to learn the essential family information.

Tape 1

- Edible Wild Plants of the Yard: 36:20.
- Threshing: 4:38.
- Herbs: 7:20.
- Interviews: 2:45.

Tape 2

- Edible Wild Plants of the Roadside and Meadows: 31:09.
- Edible Wild Plants of the Northwest: 6:42.
- Yucca: 3:51.
- Field Identification, Yard & Roadside: 15:15.

Tape 3

- Eating Wild Plants Safely & Edibility Rules: 11:41.
- Edible Wild Plants of the Woodlands: 44:24.
- Acorn Processing: 3:44.
- Field Identification, The Mountains in Spring: 11:00.

Tape 4

- Edible Wild Plants of the Desert: 29:55.
- But Prickly Pears Have Spines: 3:08.

- Edible Wild Plants of the Mountains: 11:24.
- Utilizing Edible Wild Plants: 16:27.

Tape 5

- Edible Wild Plants of the Sea Coast: 10:49.
- Edible Wild Plants of Wet Places: 12:44.
- Cattails are the Supermarket: 3:38.
- Poisonous Plants: 19:30.
- Avoiding Plant Poisonings: 3:55.
- Field Identification, The Mountains in Autumn: 15:29.

Tape 6

- Edible Wild Plants of Eastern and Central North America: 36:34.
- Edible Wild Mushrooms: 8:45.
- Eat Your Flowers Too: 9:00.
- Wild Banquet: 7:43.

IMPORTANT NOTE: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *The Dining on the Wilds* tapes are available only in NTSC format.

Dining On The Wilds, 6 Tapes &
Book \$150.00 Quantity:

Note: This item has to be special ordered. Shipping may take 2-3 weeks in the USA.

See also [Mors Kochanski Plant Videos](#)

Return to [Plant Identification & Ecology Resources](#)

Return to [Granny's Country Store](#)

Return to the [Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

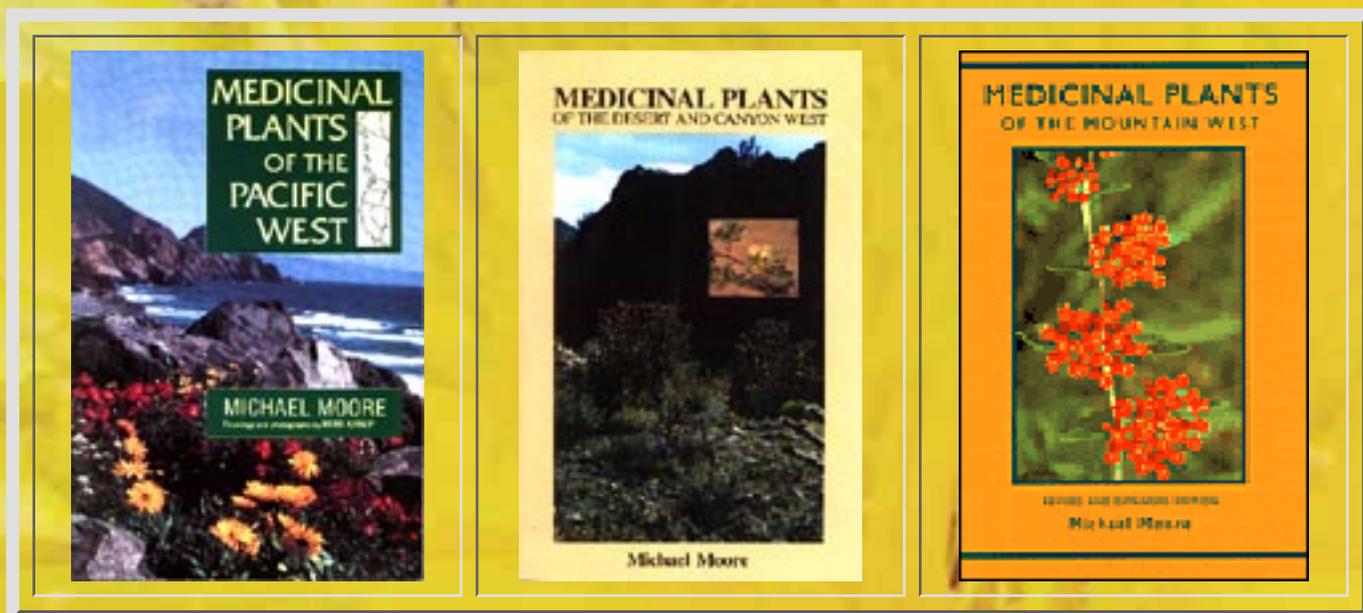
Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then

click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
E-mail Contact Page

Thomas J. Elpel's Web World Portal
Granny's Country Store
HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

Granny's Country Store Departments
Tom's Books & Videos
Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids



Medicinal Plants books by Michael Moore

There are literally thousands of herbal books on the market, yet very few really good ones. By far, the best herbal books we have ever found are those written by Michael Moore. Most authors quote what other people have used the herbs for, but Moore writes directly from personal experience.

Moore is well-versed in both physiology and pharmacognosy, and he is the director of the Southwest School of Botanical Medicine in Albuquerque, New Mexico. Clearly he has used each of the plants he writes about many times-on himself, his students and on others. Moore describes the effects of the plants on the person, and how that varies by the individual's temperament.

The best part is Moore's "diagnosis" of what conditions to use each plant for, usually poking fun at our various overindulgences and how these herbs can help to put our bodies back in balance. Medicinal Plants of the Pacific West is the most recent and best of the three, but all are good books. We only wish Michael Moore would write about east coast plants too!

These books are best used together with [Botany in a Day: Thomas J. Elpel's Herbal Field Guide to Plant Families.](#)

Medicinal Plants of the Pacific West \$22.50

Quantity:

Medicinal Plants of the Desert &
Canyon West \$14.00

Quantity:

Medicinal Plants of the Mountain West \$25.00

Quantity:

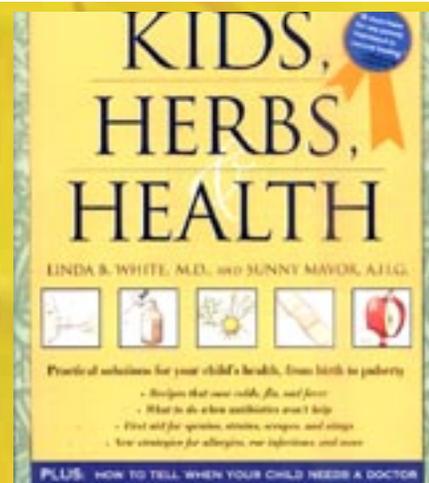


Kids, Herbs, & Health

Practical solutions for your child's health, from birth to puberty
by Linda B. White, M.D. & Sunny Mavor, A.H.G.

When we first became parents we found ourselves facing a whole list of unknowns. When do we reach for the medicine? When do we call the doctor? When should we try an herbal cure?

Needless to say, it was intimidating. Kids, Herbs, & Health provides welcome relief for parents who want to use natural and home remedies for their kids. The authors combine the best of the medical and herbal approaches for tackling the day-to-day challenges to raising healthy kids. Common childhood ailments are discussed throughout the book, such as ear infections, colds, flues, and diarrhea, with home remedies for each. The book also includes important sections about psychological disorders and attention disorders like ADD and ADHD.



Kids, Herbs, & Health helps parents to build confidence to be care givers, so they are not always waiting for the doctor to tell them what to do next. You will gain remedies and strategies with herbs that you can try at home, plus a better understanding of those times when you should consult a doctor. Kids, Herbs, & Health. 1998. 272 pages. \$22.00

Kids, Herbs, & Health \$22.00

Quantity:

[Return to Plant Identification & Ecology Resources](#)
[Return to Granny's Country Store](#)
[Return to the Wildflowers & Weeds Home Page](#)



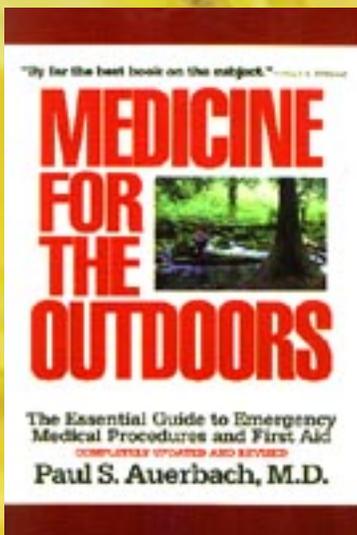
How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
E-mail Contact Page

Thomas J. Elpel's Web World Portal
Granny's Country Store
HOPS Press, LLC | Hollowtop Outdoor Primitive School, LLC
Primitive Living Skills | Sustainable Living | Wildflowers & Weeds
Society of Primitive Technology | 3Rivers Park
What's New? | Search This Site!

Granny's Country Store Departments
Tom's Books & Videos
Primitive Wilderness Survival | Nature, Wildlife & Tracking
Plant Identification & Ecology
Home-Building Books | Green Goods for the Home
Books & Gifts for Kids



Medicine For The Outdoors

The Essential Guide to Emergency Medical Procedures and First Aid

by Paul S. Auerbach, M.D.

"By far the best book on the subject." -Field and Stream

Since 1986, Medicine for the Outdoors has been acknowledged as the most comprehensive and accessible treatment guide available for just about every problem you are likely to encounter in the outdoors. Now filled with more than 250 illustrations and completely updated and expanded, this book continues to be the first-aid authority for anyone heading into the wilderness. 1999. 498 pages. \$22.50.

Medicine for the Outdoors \$22.50

Quantity:

[Return to Plant Identification & Ecology Resources](#)

[Return to Granny's Country Store](#)

[Return to the Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store

PO Box 684

Silver Star, MT 59751-0684

406-287-3605

[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

**[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)**

**Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)**



HOPS Press [Main Menu](#)

Primitive Living Skills

Tom's Journals & Articles
Tom's Class Schedule
Schools of North America
Calendar of Schools



Primitive Living Store

Stone Age Skills
Nature Awareness
Books, Videos,
Tools & Supplies

Society of

Primitive Technology

Bulletin of Primitive
Technology
On-line Articles
Subscription Information

Food Insects Newsletter

On-line Articles
Subscription Information

Sustainable Living

Alternative Construction
House-Building Classes
Articles & Resources
Ecological Economics



Home-Builder's Store

Stone, Log & Strawbale
And Many More Creative
House-Building Books,
Videos & Resources

Wildflowers & Weeds

Plant Identification
& Edible Plants
Rangeland Ecology
Weed Control Alternatives



Wildflowers Store

Plant & Mushroom Guides
Holistic Management
Grazing Resources
Books & Videos

3Rivers Park

A Place for People
Help us Secure the Rivers!

What's New?

See what's new

The Art of Nothing Wilderness Survival Video Series

Video companions to the book

Participating in Nature: Thomas J. Elpel's Field Guide to Primitive Living Skills

Also based on the article The Art of Nothing by Thomas J. Elpel.

Have you ever dreamed of being able to walk out into the woods to survive with nothing but the clothes you have on? You are not alone. In a society that is very disconnected from the natural world, many individuals find themselves wondering about what lies beyond the pavement. We know that our ancestors lived by their bare hands and wits alone, but how did they do it? How would you do it? What would it be like to be so connected with the natural world that you could just leave everything behind and walk away into the woods? It is easier than you might expect.

You might think you would need to take a lot of classes and learn a gazillion skills to survive, but the real secret is in knowing how not to need very many skills at all. For example, if you've made a bowdrill fire set with a steel knife, you may wonder how to make a set without a knife. So how do you make a good enough stone knife to work wood as nicely as your steel knife? *You don't*. By breaking sticks and abrading them on rocks you can make a completely serviceable bowdrill set without the need for a fancy knife at all, as you will see in Volume One of the *Art of Nothing Wilderness Survival Video Series*.

But you won't get just a laboratory-style skills demonstration in these videos. Instead, Thomas J. Elpel and his special guests take you camping in the real world and connect the dots, demonstrating how each of these skills are applied together to meet your basic needs of shelter, fire, water, and plant and animal foods. Also included in the videos are wild mushrooms and unique tools and cooking techniques, plus great scenery and wildlife footage, so you really get a multi-dimensional sense of the skills *and* the place.

Each video takes place in a different setting in different seasons, with Thomas J. Elpel and his guests demonstrating completely different skills to meet their basic needs. *The Art of Nothing Wilderness Survival Videos* are recorded on **certified quality recycled VHS tapes** for an environmentally friendly product!

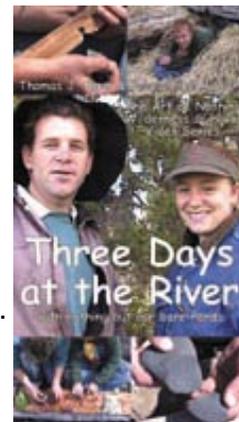
Volume One

Three Days at the River

with nothing but our bare hands

No knife. No matches. No food, sleeping bags or other gear. Join Thomas J. Elpel and 13 year-old daughter Felicia for this extraordinary primitive camping experience in southwest Montana. In the cottonwoods along the Jefferson River they demonstrate all the skills required to meet their basic needs, starting with nothing but their bare hands. Skills include:

- **Shelter:** Grass sleeping bag on hot ground.
- **Fire:** The cottonwood root bowdrill set.
- **Water:** Boiling water in found bottles and cans for purification.
- **Edible Plants:** Cattail Roots, stinging nettles, rose hips, burdock, mustard greens and milkweed shoots.
- **Fungi:** The edible tree mushroom.
- **Meat:** Porcupine--killing, skinning, butchering.



on all our websites!

Thomas J. Elpel's
Hollowtop Outdoor
Primitive School, LLC
PO Box 697
Pony, MT 59747-0697
406-685-3222
[E-mail Contact Page](#)



This Website Created on a lovable
Macintosh computer!

- **Cooking:** Shishkebabs and hot rock stir-fry.
- **Tools:** Discoidal stone knives and digging sticks.

3 Days at the River. ISBN: 1-892784-11-4. May 2002. 91 Minutes. \$25.00

International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *Three Days at the River* is only available in NTSC format.

Tom,

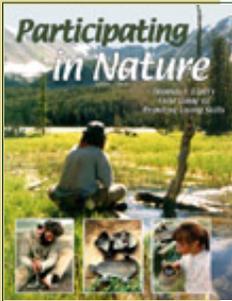
Received my video (3 Days at the River) last week, and I had to write to tell you it was very entertaining and educational. I'm a firm believer in your "art of nothing" philosophy. It is about time someone promotes that type of thinking toward outdoor recreation.

*Walk in Beauty,
Zak Baker
(used with permission)*

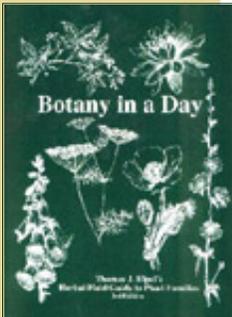
Art of Nothing: 3 Days at the River \$25.00

Quantity:

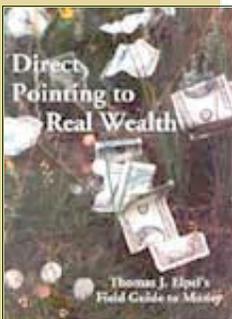
-Please scroll down the page for the "Add to Order" button.-



[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)

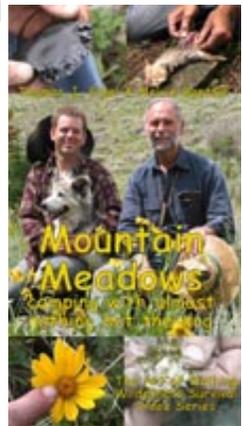
Volume Two

Mountain Meadows

camping with almost nothing but the dog

With little more than stone knives and the dog, Thomas J. Elpel and cousin Melvin Beattie venture into the Rocky Mountains to survive with whatever they can find and improvise from their surroundings. Among the wildflowers, wildlife and scenic meadows of southwestern Montana, they demonstrate all the skills needed to meet their basic needs, including:

- **Shelter:** A debris shelter with hot rocks.
- **Fire:** The mullein on sage handdrill set.
- **Water:** Purifying water with Aerobic Oxygen.
- **Edible Plants:** Sweet cicely, wild sunflower, dwarf huckleberry, musk thistle stems and "artichokes", brook saxifrage, rose petals.
- **Meat:** Ground squirrels--killing, skinning, butchering.
- **Cooking:** Cooking on an upright rock slab.
- **Tools:** Glass-knapped knives & the jo stick.



Mountain Meadows. ISBN: 1-892784-13-0. July 2002. 90 Minutes. \$25.00

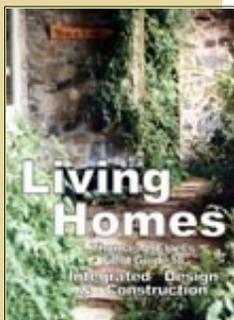
International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *Mountain Meadows* is only available in NTSC format.

Hi Tom & Renee,

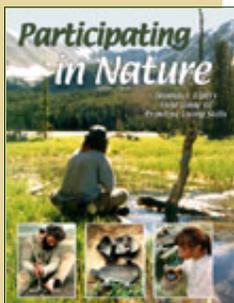
I have received your videos 3 Days at the River + Mountain Meadows. Fantastic

work!!! They are two of the best videos I have ever seen. You did a great job, and I can't wait until you do more.

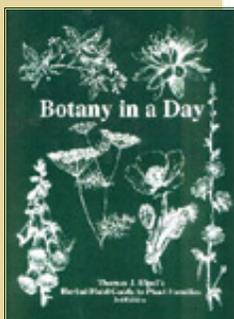
*Thank You,
Ted Barber
(used with permission)*



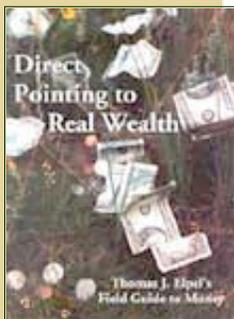
[Living Homes](#)



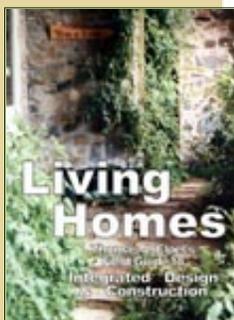
[Participating in Nature](#)



[Botany in a Day](#)



[Direct Pointing to Real Wealth](#)



[Living Homes](#)

Dear Tom,

I recently purchased two videos that you produced (3 Days at the River and Mountain Meadows). I guess because of my background, I more/less have the same philosophical approach to the learning and teaching of these skills - from that of a naturalist. As such, I extend to you "a job well done". I look forward to more of them.

*Take Care.
Ray Vizgirdas
Fish and Wildlife Biologist
(used with permission)*

Art of Nothing: Mountain Meadows \$25.00

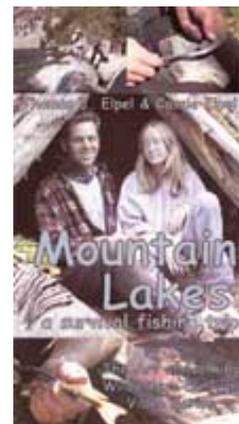
Quantity:

-Please scroll down the page for the "Add to Order" button.-

Volume Three **Mountain Lakes** a survival fishing trip

With little more than a flint & steel kit and a copper drinking cup, Thomas J. Elpel and daughter Cassie trek five miles back into the Rocky Mountains for a few days of fishing, fun, and survival living. Among the spectacular lakes and mountain peaks, they demonstrate all of the skills require to meet their basic needs, including:

- **Shelter:** Rock and log shelter with a fire.
- **Fire:** Flint & Steel Kit + Making char cloth.
- **Water:** Drinking from mountain streams.
- **Edible Plants:** Wild onions and glacier lilies.
- **Meat:** Mountain Suckers-fishing by hand, snagging by hook, plus fishing laws.
- **Cooking:** Cooking fish on hot coals, plus steaming wild vegetables in a stone oven.
- **Tools:** Tin can knives, plus forging the nail knife and making a pine bark pot.



Mountain Lakes. ISBN: 1-892784-14-9. July 2003. 104 Minutes. \$25.00

International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. *Mountain Lakes* is only available in NTSC format.

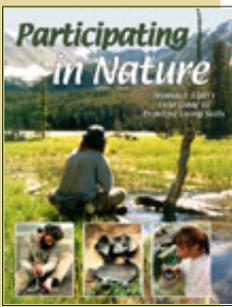
Art of Nothing: Mountain Lakes \$25.00

Quantity:

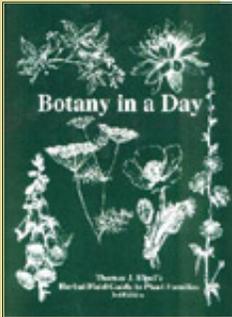
**Discount: Order all three
Art of Nothing Wilderness Survival Videos and save \$15.00.**

All Three Art of Nothing Videos \$60.00
(Save \$15)

Quantity:



[Participating in Nature](#)



[Botany in a Day](#)

When will Volume 4 in the Art of Nothing Series be out?

Probably not until December 2004 at the earliest.

We have our hands full with a lot of other projects right now!

Ordering Information

Order on-line with your Visa, Mastercard, or Discover. Simply enter the quantity of each item you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

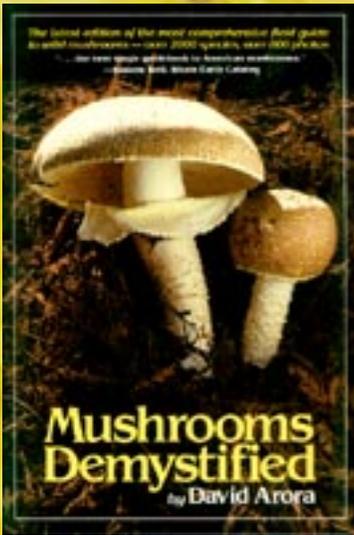
**Thomas J. Elpel's
Hollowtop Outdoor Primitive School, LLC
PO Box 697
Pony, MT 59747-0697
406-685-3222
[E-mail Contact Page](#)**

Main Menu

[Primitive Living Skills Page](#) | [Primitive Living Store](#)
[Society of Primitive Technology](#) | [Food Insects Newsletter](#)
[Sustainable Living Page](#) | [Home Builder's Store](#)
[Wildflowers & Weeds Page](#) | [Wildflowers Store](#)
[3Rivers Park](#) | [What's New?](#) | [Search This Site!](#)

Mushrooms Demystified

by David Arora



"Bring home what looks like a wild onion for dinner, and no one gives it a second thought--despite the fact it might be a death camas you have, especially if you didn't bother to smell it. But bring home a wild mushroom for dinner, and watch the faces of your friends crawl with various combinations of fear, anxiety, loathing, and distrust! Appetites are suddenly and mysteriously misplaced, vague announcements are hurriedly mumbled as to dinner engagements elsewhere, until you're finally left alone to "enjoy" your meal in total silence.

"For there are few things that strike as much fear in your average American as the mere mention of wild mushrooms or "toadstools". Like snakes, slugs, worms, and spiders, they're regarded as unearthly and unworthy, despicable and inexplicable--the vermin of the vegetable world. And yet, consider this: out of several thousand different kinds of wild mushrooms in North America, only five or six are deadly poisonous! And once you now what to look for, it's about as difficult to tell a deadly Amanita from a savory chanterelle as it is a lima bean from an artichoke."

*--David Arora,
Mushrooms Demystified*

We tend to fear that which we do not know, and because mushrooms are mysterious, we have a mass cultural hysteria about them. But there is no need to fear all fungi. Author David Arora is one fun guy you will truly love. Through his encyclopedic book, *Mushrooms Demystified*, Arora teaches you how to distinguish the poisonous few from the edible many. The book includes keys to more than 2000 species from across North America, although with a definite California slant, the author admits.

Mushrooms Demystified emphasises the "Beginner's 70" most common and distinctive mushrooms that should be learned first. Arora uses macroscopic features for identification, so you won't need a microscope to learn about the mushrooms you find. Neither does he use a lot of technical words in the text. Arora keeps it as simple--and fun--as possible.

There is a fantastic gallery of color photos included in the center of the book, but the majority of the pictures are in black and white. Cross-referencing with color pictures from another source is always wise to insure accurate identification. *Mushrooms Demystified* was first published in 1979, then revised and expanded to cover more of the country, with updated text and photos. It has long been considered the mushroom-hunter's Bible. ISBN: 0-89815-169-4. Second Edition, 1986. 959 pages. Cost: \$40.00.

Mushrooms Demystified \$40.00

Quantity:

-Please scroll down the page for the "Add to Order" button.-

All That the Rain Promises, and More...
A Hip Pocket Guide to Western Mushrooms
by David Arora



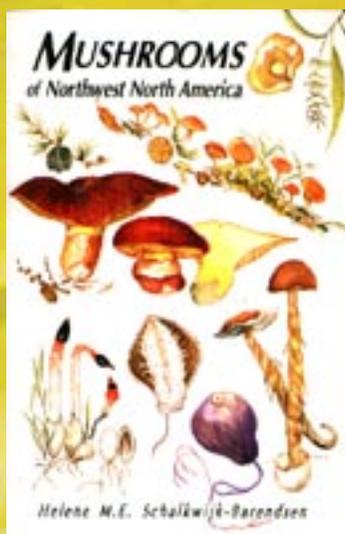
All That the Rain Promises, and More... is truly a "hip" pocket guide, loaded with David Arora's fun facts and stories about 200 of our most common mushrooms. This is a beginner's book, loaded with full color photographs and easy to navigate. You can take it into the field to quickly identify the mushrooms you find. It is nicely cross-referenced with *Mushrooms Demystified* so you can turn to that book for more in depth coverage, when needed. In such a compact book it is surprising how much space Arora found for whimsical stories. I couldn't put the book down until I had read them all. ISBN: 0-89815-388-3. 1991. 260 pages. Cost \$18.00.

All That the Rain Promises, and More... \$18.00 Quantity:

-Discount-
-Order both *Mushrooms Demystified* and *All That the Rain Promises* and save \$5.00.-

Mushrooms Demystified + All That the Rain Promises \$53.00 Quantity:

-Please scroll down the page for the "Add to Order" button.-



Mushrooms of Northwest North America
by Helene M.E. Schalkwijk-Barendsen

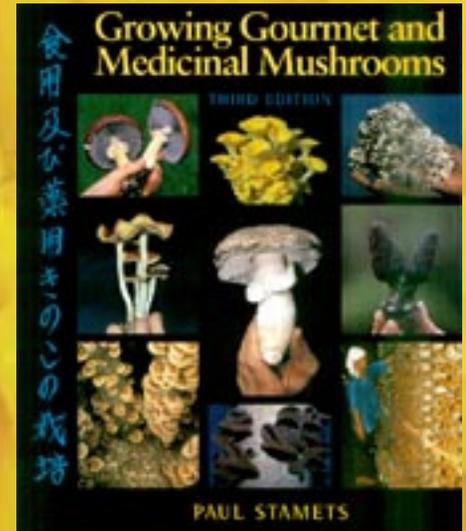
Anyone who studies birds, plants, or mushrooms for awhile knows that there are certain advantages to drawings, allowing subtle details to pop out that might not show up in a photograph. That's one of the features I really like about *Mushrooms of Northwest North America*. Helene M.E. Schalkwijk-Barendsen spent twenty years meticulously painting each of the 550 species featured in this fine book. The result is a series of illustrations that are both technically accurate and works of art!

I also like that *Mushrooms of Northwest North America* includes descriptions and keys to the families of mushrooms. The keys are minimally technical, reduced to the simplest terms possible, and accompanied by an easy, illustrated glossary. ISBN: 1-55105-046-3. 1991. 414 pages. Cost \$20.00.

Mushrooms of Northwest North America \$20.00 Quantity:

-Please scroll down the page for the "Add to Order" button.-

Growing Gourmet and Medicinal Mushrooms by Paul Stamets



Our species knows much less about fungi than we do about plants or animals, since fungi live mostly hidden underground or in rotten wood and in piles of manure. We just don't notice these quiet neighbors until they suddenly pop up and release their spores. But in this incredible book, author Paul Stamets has pulled together all the latest information about fungi life-cycles and how to create the necessary conditions to grow your own.

Growing mushrooms seems much like a cross between beer-making and planting a garden. In this book Stamets teaches you how to collect fungi spores and culture them in malt extracts, then transplant the mycelium into the proper mediums to grow crops of mushrooms.

Growing Gourmet and Medicinal Mushrooms especially encourages outdoor mushroom gardening, teaching you to find appropriate habitats in your own yard, then adding the necessary ashes, straw, manure, logs, and/or other nutrients needed for each particular species. More than thirty wild and cultivated species are covered in the book. Techniques for growing mushrooms indoors are also included. Mushroom culturing has great potential to be integrated into permaculture farming systems. As with most of the books we carry, I ordered this title first for my own interest, and I am excited by the new possibilities presented in the text. ISBN: 1-58008-175-4. 1993, 2000. Third Edition. 574 pages. Cost \$45.00.

Growing Gourmet and Medicinal
Mushrooms \$45.00 Quantity:

Also be sure to see Tom's Mushroom Photo Album:
[**A picture gallery of mushrooms I have found.**](#)

[**Return to Plant Identification & Ecology Resources**](#)

[**Return to Granny's Country Store**](#)

[**Return to the Wildflowers & Weeds Home Page**](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
**[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
**[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
**[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)******

Granny's Country Store Departments
[Tom's Books & Videos](#)
**[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
**[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)****



Dandelions - If you can't beat them, eat them!

Dandelions may be the most recognized plant on earth. They certainly grow everywhere, from lawns to high mountain meadows. Although there are native dandelions, the most commonly found species is *Taraxacum officinale*, an import from the Old World. All dandelions are edible, though palatability may vary from region to region.

cleaned, chopped and boiled roots make a pretty decent meal, and it seems to be one of the more efficient root crops to gather for a meal. The roots are rich in inulin polysaccharides, which have a tendency to sweeten the longer they are cooked.

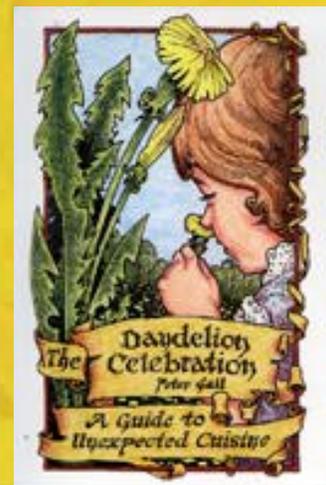
Mostly I like to harvest dandelion roots out of the lawn at home for use as a coffee substitute. The roots should be washed, dried, and then slow roasted in the oven until they are dark in color and rich in aroma, but not burned. Then the roasted roots can be ground into powder in a grinder as shown here, or on a stone metate. I really enjoy the dandyroot flavor, but the main reason I drink it is to promote healthy liver function. When constipated, the dandyroot drink helps to get my system moving again. Dandelions are not necessarily laxative, but stimulating the liver facilitates better digestion as well as better health overall, so that I can better fight off the colds the kids bring home from school. I also like to eat dandelion greens. At home I frequently add a few leaves to my salads or pile them on thick on a hamburger, veggieburger or egg sandwich.



The Dandelion Celebration A Guide to Unexpected Cuisine by Peter Gail, Ph.D.

Dandelions are one of the most nutritious plants on earth, yet every year people senselessly spend millions of dollars on chemicals trying to kill them. Then they go to the grocery store and spend still more money on lifeless, nutritionless lettuce for the table. But now, with Peter Gail's book, *The Dandelion Celebration: A Guide to Unexpected Cuisine* you can save money, eat better, and still clean up the lawn!

The Dandelion Celebration includes some of the world's best recipes for dandelion greens, flowers and roots. Peter Gail, a colleague of the late Euell Gibbons, collected the recipes over a twenty-year period from friends, colleagues and students. The recipes cover everything from soups and casserole to ice cream and wine.



On average, I eat about one dandelion every two days through the growing season, usually on sandwiches. Dandelions are about the first and the last available greens. I keep a simple digging tool in a handy spot and harvest the dandelions root and all. Most of the time I put the greens on a sandwich. The roots I clean and dry. When I save up enough roots I roast them and grind them for a delicious coffee substitute. Originally I hoped to eat all the dandelions out of our lawn, but I wasn't able to keep up. Now I pay my kids five cents for each dandelion root they dig up, cut and wash for me. Anyway, I highly recommend *The Dandelion Celebration* as a tool for better health and better living. With the aid of this book, you too will be able to prepare gourmet meals from your backyard weeds, and you will eat healthier than ever before!

The Dandelion Celebration. ISBN: 1-879863-51-0. 1990, 1994. 156 pages. Cost \$11.00.

The Dandelion Celebration \$11.00

Quantity:



Dandy Blend

Instant Dandelion Beverage and Coffee Substitute

Looking for a unique present? Dandy Blend is a caffeine-free coffee substitute made from roasted, naturally sweetened dandelion roots. It is so good that even our kids like it!

To prepare Dandy Blend, simply add a teaspoon of the powder to 8 OZ. of water or milk, either hot or cold. Dandy Blend can also be served as an iced drink in hot weather. For a coffee-like flavor, Dandy Blend can be added to ice cream, frosting or pudding. Our six ounce container makes 100 servings! Ingredients: extracts of roasted barley, rye, dandelion root, beet root, and chicory root. Product of Canada. 6 OZ. \$12.00.

Dandy Blend Coffee Substitute \$12.00

Quantity:

[Return to Plant Identification & Ecology Resources](#)

[Return to Granny's Country Store](#)

[Return to the Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about

each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

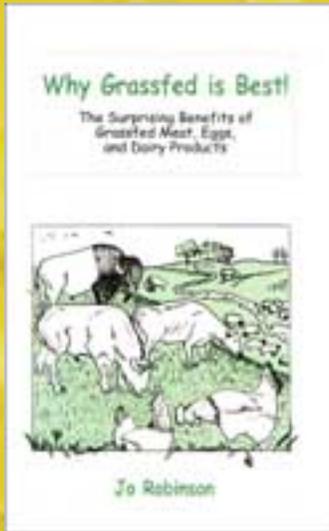
Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605
[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)
[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)
[Society of Primitive Technology](#) | [3Rivers Park](#)
[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments
[Tom's Books & Videos](#)
[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)
[Plant Identification & Ecology](#)
[Home-Building Books](#) | [Green Goods for the Home](#)
[Books & Gifts for Kids](#)

Why Grassfed is Best!

The Surprising Benefits of Grassfed Meat, Eggs, and Dairy Products
by Jo Robinson



There is a lot of talk these days about eating fish to benefit from the omega-3 fatty acids in the meat. What most people do not realize, however, is that livestock raised on a grassfed diet also has meat high in omega-3 fatty acids. Milk from pasture-raised dairy cows is also high in omega-3 fatty acids, as are the eggs from pasture-raised poultry. But the omega-3 content takes a nose-dive when the animals are taken off of the pasture, and raised on a diet of grains.

Why Grassfed is Best! explores the newly discovered benefits of eating meat, eggs, and dairy products from grassfed animals. When grazing animals are raised on their natural diet of grass instead of grain, their products are lower in "bad" fat and calories, but higher in

potentially lifesaving "good" fats. What's more the animals are healthier and less stressed, and they are more beneficial to the environment.

New York Times best-selling author Jo Robinson discovered the health benefits of grassfed animals while working on *The Omega Diet*, a widely acclaimed book about the Crete Mediterranean diet (co-authored with Dr. Artemis P. Simopoulos.) In *Why Grassfed is Best!*, Robinson takes a closer look at the many advantages of switching from grainfed to grassfed products. This is an easy and fun book to read, and it includes a directory of sources around the USA and Canada for you to buy grassfed meat, eggs and dairy.

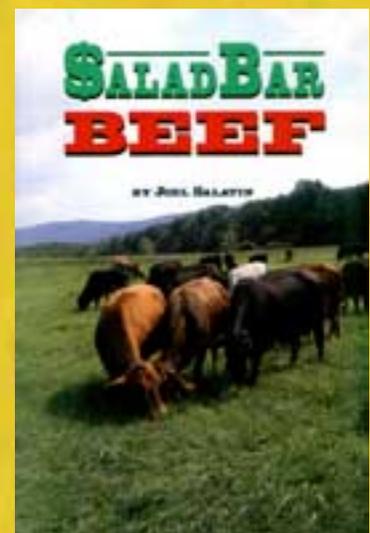
Whether you are in the livestock business, or a consumer looking for healthy choices, this book will forever change the way you look at meat, eggs, and dairy! **Why Grassfed is Best! TEMPORARILY OUT OF PRINT. NEW EDITION COMING SOON.**

Salad Bar Beef

by Joel Salatin

Joel Salatin's book *Salad Bar Beef* is much like a sequel to Jo Robinson's book *Why Grassfed is Best!*, described above. Where Robinson talks about the benefits of grassfed meat, Salatin gets into the details of how to profitably run a grassfed beef operation in today's markets.

But instead of calling it "grassfed beef", the author points out that pastures are full of polycultures of many diverse plants that livestock eat along with the grass. In the same sense that we think of a salad bar as a healthy choice for dinner with many fresh vegetables besides lettuce, a pasture should be a healthy, fresh and diverse menu for cows. Salatin's cows are kept moving almost daily, so that they are always raised on the freshest salad bar of



forage plants. They are never left milling around in the mud or manure for days or weeks, as cows might be in other ranching operations.

Salatin's Salad Bar Beef operation is in the east, where there is plenty of moisture and lots of tender green grass, so some of the details are skewed for us westerners who see only 2-3 months of green per year, but the basic principles are sound, and can be adapted to fit ranching operations anywhere. For ranchers that are tired of prices dictated by multi-national agri-business corporations, Salatin offers an exciting alternative to keep the farm healthy and prosperous. **Salad Bar Beef ISBN: 0-9638109-1-X. 1995. 368 pages. \$35.00**

Salad Bar Beef \$35.00

Quantity:

[Return to Plant Identification & Ecology Resources](#)

[Return to Granny's Country Store](#)

[Return to the Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store
PO Box 684
Silver Star, MT 59751-0684
406-287-3605

[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal
[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)
[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

Society of Primitive Technology | 3Rivers Park

What's New? | Search This Site!

Granny's Country Store Departments

Tom's Books & Videos

Primitive Wilderness Survival | Nature, Wildlife & Tracking

Plant Identification & Ecology

Home-Building Books | Green Goods for the Home

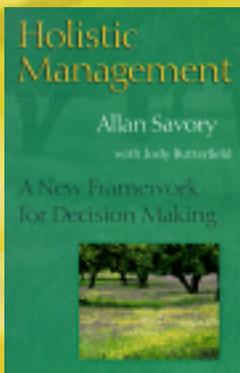
Books & Gifts for Kids

Holistic Management

by Allan Savory with Jody Butterfield

There is a common assumption that cows have a negative impact on rangeland. Cows eat the grass, and the only way for the plants to recover is to take away the animals. Some environmentally concerned people even want to remove all livestock from public lands. But the reality, as Allan Savory discovered, is that hooved animals play a critical role in the health of arid rangeland ecology. There is a magical relationship between the soil and the hooves of grazing animals. In seasonal rainfall environments the land rapidly turns to deserts without animal impact.

Historically western rangelands were grazed and maintained by massive herds of buffalo. The important part was not the buffalo, but the sequence of grazing. Predators forced the buffalo to stay clustered in tight herds for safety. Some herds were so massive that observers described them as miles wide and hours or even days long in passing. They destroyed everything in their path, trampling all the grasses, all the sage--every bit of organic matter--right into the soil. Their hooves and urine killed the moss while desirable plant seeds were pounded into the soil to germinate. Old or dead vegetation was trampled into the ground where soil microbes could break it down. The organic litter helped retain moisture for plant growth. Gradually the debris rotted and returned the nutrients to the soil. The roaming bison left the prairie to recover without further interference, allowing for lush and unrestrained growth.

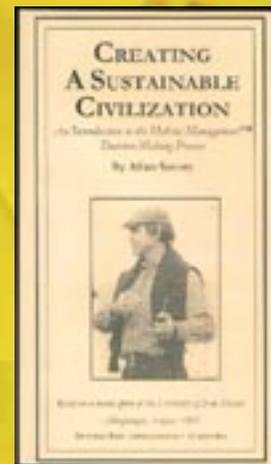


Putting fences across the land and stocking it with cattle creates a new sequence of grazing, which logically has a different effect on the land. Without predators the cattle spread out and graze over wide areas--they no longer trample down standing dead grasses from previous years. This old material blocks sunlight, killing the new growth below. Old vegetation stands for years, slowly decomposing through oxidation and weathering. Valuable nutrients are locked up in the old growth--unavailable for living plants. With fences to keep the cattle contained, the young plants are eaten repeatedly as grazing animals return without allowing the vegetation to recover. Burning the range can accelerate desertification,

stealing vital organic matter from the soil and putting it into the atmosphere to contribute to global warming.

Loss of organic matter also results in lack of soil structure, breaking down the granules or clumps of aggregated soil particles that allow air circulation and penetration of water and roots. Raindrops strike the exposed ground, pulverizing and separating the soil, just like you might find under the drip line of a house. The fine particles of silt, sand and clay dry to form a hard surface crust. Seeds cannot grow through the capped surface, and bare patches develop between the plants. Weeds, brush and grasshoppers thrive in the open patches. New moisture is lost as runoff and may cause floods. Water bypasses the water table and old springs can dry up. Freezing and thawing, plus wetting and drying can also cause the top inch of the soil to become so porous and fluffy that seeds dry out before they germinate.

People assume that removing the livestock would allow the land to recover, but in reality, the complete removal of livestock accelerates the process of desertification. We are losing the land right out from underneath our feet, yet few people have even noticed. For more details please read my on-line article [The American Sahara](#). Allan Savory discovered, or possibly re-discovered, the important link between hooves and the soil. In his book, *Holistic Resource Management*, he outlines the ways we can use livestock to restore the health of the land. Savory also puts forth a holistic system for making sound land management decisions, which could literally change the world... if more people knew about it.



Allan Savory's work has been highly influential to my own writing. I bought the first edition of *Holistic Resource Management* as soon as it came out in 1988. I read it many times over. The new edition, called *Holistic Management: A New Framework for Decision Making* is even better.

Many of Savory's ideas were strongly influential towards my book, [Direct Pointing to Real Wealth: Thomas J. Elpel's Field Guide to Money](#).

Holistic Management Resources available through HOPS

Holistic Management : A New Framework
for Decision-Making, 2nd Edition \$30.00 Quantity:

Allan Savory's video ***Creating A Sustainable Civilization*** is an excellent way to introduce people to the concept of Holistic thought and management, without over-loading them with details. Every person I have shown this video to was thoroughly stunned by the presentation and message.

International Customers Please Note: Do you know that different countries use different video formats? All our videos are in NTSC format, used mostly in North America, Japan and Taiwan. Not sure what format is used in your country? Click [here](#) to find out. For our European customers we may be able to special order PAL format. Please send an e-mail to us through our [E-mail Contact Page](#) to inquire.

Creating A Sustainable Civilization
Video \$25.00 Quantity:

Holistic Management book + Sustainable
Civilization video (Save \$5.00) \$50.00 Quantity:

[Return to Plant Identification & Ecology Resources](#)

[Return to Granny's Country Store](#)

[Return to the Wildflowers & Weeds Home Page](#)



How to Place Retail Orders

Order on-line with your Visa, Mastercard, or Discover. Simply click on the links to learn more about each product and enter the quantity you want in the little white boxes, then click the "Add to Order" button. We also accept checks and money orders. For orders by mail, e-mail, or telephone, you can still use the on-line shopping basket to tally the order and postage. Then print or copy the information and send it in to:

Granny's Country Store

PO Box 684

Silver Star, MT 59751-0684

406-287-3605

[E-mail Contact Page](#)

Thomas J. Elpel's Web World Portal

[Granny's Country Store](#)

[HOPS Press, LLC](#) | [Hollowtop Outdoor Primitive School, LLC](#)

[Primitive Living Skills](#) | [Sustainable Living](#) | [Wildflowers & Weeds](#)

[Society of Primitive Technology](#) | [3Rivers Park](#)

[What's New?](#) | [Search This Site!](#)

Granny's Country Store Departments

[Tom's Books & Videos](#)

[Primitive Wilderness Survival](#) | [Nature, Wildlife & Tracking](#)

[Plant Identification & Ecology](#)

[Home-Building Books](#) | [Green Goods for the Home](#)

[Books & Gifts for Kids](#)