

*How to live in  
Eastern Ontario:  
a guide for  
Human People*

by

Dr Grumpgrump, PhoooDoo.

*Research Curator at the Chaos Corners Centre for the Study of One Thing  
and Another, Bishops Mills, Ontario.*

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# Introduction

## Section 1: Introductory Introduction

I've often been told, by daughters and museum directors, that...

"The Real World' Is a delusion and a deception that is only in your head to corroborate a twisted view of life from your unique set of experiences, with absolutely nothing to do with what anyone else perceives as their 'Real World'" -- in Weirs House kitchen, 24 November 2005

So the present document is intended as an exposition of the Real World, from my unique set of experiences. It's specifically applicable to those who live in rural or suburban habitats off the Shield in eastern Ontario, though also it draws on experiences of life as hunter-gathers in urban environments across Canada in the 1970's. E. Raymond Hall famously stated that "*So much has been written on the habits of man that it would be futile to attempt even to abstract such information in the present booklet*" (1955. *Handbook of the Mammals of Kansas*), but this is just the habits and conclusions of me, so this is only 1/6.5 billionth of what might be written by humanity. It's not written to be universally right, but to be an explanation of what seems right to me.

All advice is, of course, frequency-dependent: no Way can be maintained when it enjoys 98% acceptance without changes from the rules appropriately laid down when 1%, 10%, or 50% of the population accepted it, so there are both overt, implied, and unknown assumptions here about the ambient consumerist, or quasi-consumerist, culture, of late-20<sup>th</sup> and early 21<sup>st</sup> century central Canada.

A lot of this has been written before, in different contexts, and this beta version of the assembly has been hurriedly compiled, on an amazingly laggard computer, amidst numerous other duties, for Jen & Rory's amusement as they relax from the tension of implementing a compromise of their divergent notions of the degree of elaboration that should appropriately attend the inception of a marital dyad. -- *Grumpgrump*

## Section 2: Auto-bio-apology

I grew up in the Housatonic Valley of western Connecticut, fly-fishing for Smallmouth Bass in that "Great River," and becoming a naturalist among the living dead of a suburbanizing landscape and under the tutelage of the Peterson Field Guide series.

Instruction in American History at Hopkins Grammar School, in New Haven, pushed me towards the position of a United Empire Loyalist, and the pacifist requirements of Christianity led me to register with the Selective Service as a Conscientious Objector. At Cornell University I began museum work as a student assistant, discarding data-free collections of eggs just when egg-shell thinning was demonstrating the effects of DDT, and then reorganizing the Mammal and Bird collections under the supervision of Dick

Weisbrod. Jim Rising, as a post-doc, had been the only individual to deposit research collections in the Bird collection while I worked there, and I followed him, and my loyalist tendencies (which had been strengthened by the Centennial-year Canadians I'd met at Cornell), to the University of Toronto, to study hybridization among Birds. In the meantime, thoughtful Roman Catholics had incinerated my records at the New Haven Selective Service board.

A series of chances combined the taxon I had dabbled in as an undergraduate with Bill Brown with Jim's multivariate techniques to make geographic variation in Northern Leopard Frogs (*Rana pipiens*) my doctoral thesis topic. In 1972 I showed up at the Herpetology Section of the National Museum of Natural Sciences, National Museums of Canada, and began to work on the herpetofaunal survey of Canada with Francis Cook.

In 1973 I married **Aleta Karstad**, who introduced me to Vancouver Island. In the course of this initial field trip, we collected the last Leopard Frogs ever recorded in the upper Columbia Valley. We were dispossessed from a series of apartments in Toronto, until we moved to Cedar Wild for the summer of 1974 and the following winter, after which we moved to Ottawa to house-sit the residence of a staff member near the NMNS. At the NMNS I futzed about while Aleta painted the Unionid mussels for Arthur Clarke's *Freshwater Molluscs of Canada*, and in 1975 she began watercolour portraits for Francis Cook's *Natural History of Canadian Amphibians and Reptiles*, a series that continues, as living Canadian specimens of the rarer species are found, to this day.

In the spring of 1976 we set out with Franklin D. Ross, on coast-to-coast-to-coast field work for *Canadian Nature Notebook*, an illustrated natural history of Canada. We spent the spring of 1977 on Vancouver Island, and then returned to Toronto. I finished his PhD thesis, and Aleta finished *Canadian Nature Notebook*, as we and Frank supported ourselves by skeletonizing salvaged fish from Kensington Market for the NMNS Zooarchaeological Identification Centre. This was the origin of the phrase: "Before you do any kind of art, first you've got to catch your fish." In 1978 Frank returned to his native Massachusetts, and we moved to Bishops Mills to be near a two year post-doctoral fellowship at the NMNS, and to this date I am, through unemployability elsewhere, the CMN's longest-standing research associate.

Our daughter, Elsa, was born in 1979. During my post-doc at the NMNS we collected in coastal and montane B.C. and southern Ontario, and Aleta was the biological consultant for the television series *The Amateur Naturalist*. Through the 1980s we travelled around Canada, collecting herpetofauna, Birds, Crayfish, land snails, freshwater mussels, and wetland plants for the NMNS and writing (though not always successfully publishing) popular natural history books.

We spent the spring and summer of 1984 on the Bruce Peninsula, where Aleta painted delicate watercolours of flowers for Circle Arts gallery in Tobermory, and that summer signed contracts for *Wild Seasons Daybook* (1985), and for *This Fragile Inheritance: A Painter's Ecology of Glaciated North America*, a book about the impact of people on the ecology of Canada and the northern USA. In May of 1985 Elsa was killed by a car on the return from a painting and research trip to New Brunswick; our daughter Jennifer was born one year later in Vancouver after a precarious pregnancy during field work for

*Fragile Inheritance.*

In 1987 our publisher was swallowed by another, and they were traded to still another after we left home for a year of work on a book of paintings of birds of coastal B.C., in the company of Rose-Marie van der Ham. Here Aleta worked on life-size watercolours of freshly collected birds, painted, on site, in their habitats. In 1990 the Western Canada Wilderness Committee published our first attempted promoton of conservation: *North Moresby Wilderness: The Cumshewa Head Trail*.

As I worked for two years on a one-year herpetofaunal survey of the Bruce Peninsula, developing the database structure that continues to be the repository of all our observations, Aleta survived repeated excursions to death's door during successful chemotherapy for acute myeloid leukemia. We then swore off multi-year, no-net-income, labour-of-love contracts with uncaring institutions. In 1994 we surveyed the natural history of the Lake Ontario Waterfront for *A Place to Walk: A naturalists' journal of the Lake Ontario Waterfront Trail* (1995).

In 1993 we embarked on our first quixotic public venture, an inventory of our local watershed, **The Biological Checklist of the Kemptville Creek Drainage Basin**, which was to have been an all-taxa biodiversity database. We hoped to bring back to the local community the knowledge that was centralized in specialized archives, so that everything recorded about the local area would be available locally. The debut of the BCKCDB did not produce the widespread screams of enthusiastic endorsement and assistance we had anticipated. Some People didn't understand how we could be a checklist, while the rest classified us as commercial consultants rather than a public institution.

Not having learned the lesson that this failure-to-be-understood meant that our ideas were not understood, in 1997 I suggested that the orphaned Carleton University natural history collections could become the nucleus for a regional natural history research and teaching museum for eastern Ontario, and Aleta made it so. This was to be a new kind of institution that to on the largely ignored primary responsibility of government, which we would radically redefine as the relationship between People and their non-human neighbours. The methods of this institution would grow out of the culture of the traditional natural history museum. Its interactions with the public would flow from its collections and research, explicitly tied to the scholarly methods the collections embody and the methods exemplify. I served the **Eastern Ontario Biodiversity Museum** successively as Curator, Research Curator, and Trustee.

In 1995 I began to survey the distribution of Unionid mussels throughout eastern and northern Ontario, and my interest in my "thesis species" continues with studies of hibernation and movements in Grenville County, and documenting the disappearance of populations in northern Ontario. I also try to follow the abundance and distribution of many native and invasive species. In 1998 we began the on-going weekly winter public observation project "Mudpuppy Night in Oxford Mills."

As the EOBM divested itself of our services, and then failed, we founded the Bishops Mills Natural History Centre, where I scamper about as Research curator, to carry on

what we had seen as the museum's work.

In 2004 we launched ***theNatureJournal***, an update and interpretation of the Grinnell System of keeping archival field notes. We're currently embroiled in "The Crayfish Project," "Terrestrial Gastropods of Canada," the "Ontario Ecopassages Task Force," and the Limerick Forest Advisory Committee, and we're increasingly often asked to consult with neighborhoods that find themselves threatened by proposed "development" projects.

***Only the following quoted e-mail is available for the beta edition of this book from Section 3: Philosophical background; Section 4: Self assessment; and Chapter 1: Coals of Fire Technology.***

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Subject: Re: [NatureList] What would you do for the environment if you were Prime Minister?  
Date: Fri, 19 Jan 2007 16:58:34 -0500  
From: Frederick W. Schueler <bckcdb@istar.ca>  
Organization: Bishops Mills Natural History Centre  
To: David Suzuki Foundation <[subscribers@davidsuzuki.org](mailto:subscribers@davidsuzuki.org)>, Eastern Ontario Natural History list-serve <[NatureList@thenaturejournal.com](mailto:NatureList@thenaturejournal.com)>, Alexa McDonough <[mcdonough.a@parl.gc.ca](mailto:mcdonough.a@parl.gc.ca)>

David Suzuki Foundation wrote:

> *What would you do for the environment if you were Prime Minister? David Suzuki wants to know!*

\* I don't know if the Prime Minister has the authority to do many of these, but this is what I've got on a page from a 1996 "Alexa McDonough NDP Today's Priorities" notepad on my computer:

- arrange a sustainable world ecological order.
- publish a new edition of Systema Naturae.
- extirpate Zebra mussels.
- prohibit armed conflict.
- found a Ministry of Natural Beauty of Canada with 2-yr National Service.
- institute a bioregional Senate.
- pay the wild tithe (10% forever wild) on all parcels of private and public land.

- bring back the Great Auk by artificial selection on a colony of Razorbills.

- revoke compulsory education by separation of school and state

I guess it's been 10 years now, and I don't seem to have made much progress on any of them, even with the advantage of not being Prime Minister.

fred.

-----  
Bishops Mills Natural History Centre  
Frederick W. Schueler, Aleta Karstad, Jennifer Helene Schueler  
RR#2 Bishops Mills, Ontario, Canada K0G 1T0  
on the Smiths Falls Limestone Plain 44° 52'N 75° 42'W  
(613)258-3107 <bckcdb@istar.ca> <http://pinicola.ca>  
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## CHAPTER 2: “Halfway between the equator and the poles”

### SECTION 1: Climate

#### THE ICE STORM SONG (AKS, January 1998)

*Stand by my side as the rain starts to freeze  
And share in my vision of trees.  
Our breath is in their leaves  
Their roots embrace the living soil of home, our life,  
Our forest.*

Trees are companions to all things alive  
As stewards they compass the land.  
So wordlessly they stand  
But patiently with seasons they will grow  
Our forest.

Slowing the drying and calling the rain  
Easing the flooding in spring  
They wrestle with the wind  
And break its force to quietness within  
Our forest.

Stand by me here as the ice crashes down  
And share in a sadness of trees  
That bent beneath the ice

Their bending turned to breaking after days —  
Our forest.

The storm is now over, the breaking is done,  
Now frozen in violence still.  
All winter they will stand,  
'Til springtime wakes the trees to weep. How long to heal  
Our forest?

We see by the trunks of our Maples that stand,  
The Ashes and Cedars that bend,  
Where warm air meets the cold,  
Halfway between Equator and the Pole, ice shapes  
Our forest.

*Stand by my side as the rain starts to freeze  
And share in my vision of trees.  
Our breath is in their leaves  
Their roots embrace the living soil of home, our life,  
Our forest.*

***no text is available for these topics for the beta edition of this book***

ice storms

extent and depth of frost in the ground

Depth of Snow, snow belts

sugaring

Wood Frog/Toad times

dry springs

time til wilt

dry & wet summers

thunderstorms, tracks, and white rain

date of frost

refilling of vernal pools

date of frozen ground

Environment from Hell – early frost

## SECTION 2: The rights of the “Environment”

When the government of Ontario established the present "Environmental Bill of Rights" for the province, these rights included 1) the right of the public to participate in environment decisions, 2) the doctrine that public lands and waters are held in trust by governments for wise use, 3) increased civil rights to sue polluters, and 4) protection for employees who publicize the polluting activities of their employer. These were not an environmental bill of rights, but are, rather, rights for People in a narrow sector of their interactions with their environment.

In response to the disparity between the proposed legislation and the transformation of human society that is required for an ecologically sustainable society in Ontario, I have drew up a a bill of rights for 'the environment' itself (as it is called, more properly the landscape and ecology), of Ontario (Schueler, Frederick W. 1992. *Draft of an environmental bill of rights for Ontario*. Sea Wind 6(2):27-32). This was based on my 20 years of work as a museum biologist and naturalist in Ontario, and our 8 year “Fragile Inheritance” survey, of the consequences of human occupancy of the glaciated part of North America.

Like bills and charters of human rights these are radical and simple statements of substantial, well-defined rights which are necessary to produce the desired ordering of society and the landscape. Some of these might be universally applicable, others (escarpment corridors, some of the parameters of freedom from over-capitalized exploitation) are particular to Ontario. There are deficiencies here -- I have not, for example, been able to frame a statement of the circumstances under which streams or their aquatic migrants have a right to freedom from impoundment, though such a right doubtless exists.

As a guide to individual action, the positive prescriptions still stand, but the negatively stated prohibitions against what's called “development projects” become a recommendation for individuals to struggle against such projects.

I've tried to use the technical language and ideas of ecology to frame these rights in the same way that bills of human rights use the ideas and language of human laws. This has the advantage, in contrast to more conventional legalistic wording of 'environmental' legislation of making the statement of the goal of the legislation closer to the hoped-for effect (e.g. edible fish and healthy fish-eating birds rather than zero discharge of a list of pollutants). It also promotes ecological and natural history research (and the resulting increased knowledge of the the ecology of the

Province) by many litigants in cases that would be brought under this Bill of Rights.

## **AN ENVIRONMENTAL BILL OF RIGHTS FOR ONTARIO**

**Preamble:** The land and biota of Ontario have the rights enumerated below. Recognizing that these rights have been widely ignored in the past, and that the transition to a conforming society must be both gradual and thorough, no government, or agency of government, shall knowingly allow any human activity which violates these rights, and any person or organization shall have the right to sue for the termination of any human activity which can be demonstrated to violate these rights. In the event that violations are demonstrated, the government of the Province will be responsible for ensuring that effective and prudent mitigating activities are promptly undertaken.

**1) Net Ombrotrophy.** In the absence of major natural disturbances (floods, fires, windstorm), every drainage basin has the right to a sufficiently complete and complex ecosystem that the quantity of major plant nutrients (fixed Nitrogen, Phosphorus, Potassium) falling in precipitation and dry deposition exceeds that leaving the drainage basin in streamflow.

*The fundamental finding of studies of nutrient flows in ecological communities is that the web of roots and hyphae of well developed plant and fungal communities extract nutrients so effectively that the living community releases less of these nutrients in streamflow and ground water than falls as precipitation. This article requires that every watershed have an overall vegetative cover capable of a net extraction of nutrients from precipitation. One effect of this is to restrict the extent of bare ground, indirectly controlling erosion. Net ombrotrophy is easily monitored by measuring the levels of N, P, and K in precipitation, deposition, and streamflow.*

**2) Climax Community Seed Rain.** Every area of Ontario that is modified by human activity has the right to receive propagules of all species required to re-establish a late successional plant, animal, and fungal community in the event that human disturbance is ended or changed.

*As natural areas become isolated by disturbed habitats, they lose species, both because of extinctions and because of the increased distances to similar natural habitats from which colonists might come. It becomes increasingly unlikely that dispersing propagules from other populations will be able to reach sites where they can replace extinct populations or occupy newly available successional niches. This article and the next ensure that disturbed habitats will not exclude natural areas from wide areas of the landscape.*

**3) Small Patch Size.** Every landscape in Ontario has the right to have the area of uniform human disturbances or uses restricted to 10 hectares or less, and to sufficient patches of late-successional habitats to ensure (2).

*This article restricts the scale of human disturbance of the landscape, and ensures that every landscape will be a mixture of more- and less- disturbed habitats.*

**4) Freedom from Anthropogenic Toxins.** Every area in Ontario has the right to a rate of deposition of bioaccumulating anthropogenic toxins low enough that these toxins do not lead to statistically demonstrable frequencies of pathology in fish-eating birds or other high trophic-level predators, and low enough that the flesh of high-trophic level fish (*Stizostedion*, salmonids, *Esox*) is safe for weekly consumption by lactating mothers (eating 500 g of fish flesh/week).

*The dispersion of man-made poisons into land, air, and water must be constrained to levels that allow healthy ecological communities unstressed by such poisons. This article uses effects on consumers of fish, which concentrate toxins through the long food chains characteristic of aquatic ecosystems, as indicators of unacceptable levels of such toxins: the medically determined health of mothers eating historically widely-eaten fish, and abnormalities in the conspicuous birds (herons, loons, coromorants, mergansers, etc.) that feed on fish.*

**5) Oxygenated Hypolimnion.** Every naturally dimictic lake in Ontario has the right to an oxygenated hypolimnion throughout the summer and winter, and the right to curtailment of pollution and anthropogenic eutrophication when these threaten such oxygenation of the hypolimnion.

*This article constrains any pollution, by organic material or algal/plant nutrients, that unnaturally depletes the deepwater oxygen of lakes. It may be that such pollution would generally be so conspicuous as to be unacceptable on other grounds, but this defines it as unacceptable on the basis of its effect on fundamental limnological characteristics of the polluted lake.*

**6) Shoreline and Wetland Corridors.** a) Every lake, pond, stream, river, and wetland shoreline has the right to freedom from human disruption for a distance of 10 m shoreward of the average annual high waterline and 10 m lakeward of the limit of emergent vegetation, except where landscape-wide linear anthropogenic features necessarily intersect the waterbody or for docking or launching vessels, where the disturbance shall not extend for more than twice the length of the docking vessel. b) Shorelines of impoundments have the right to intended water levels which will expose only vegetated ground.

*This article is similar to the present 10 m leave-strip movement among lakeside cottagers, but extends protection to streamsides and the full area of wetlands as well. These shorelines are not only the ecologically most diverse habitats in the landscape, but also provide corridors of movement between terrestrial habitats, and trap plant nutrients and sediment before these reach waterbodies as pollutants.*

**7) Escarpment Corridors.** Every cliff, scarp, or scree in sedimentary rock where bedrock is exposed (or where a scree is so steep that vegetation cover is less than 33% of the area) has the right to freedom from human disturbance for a horizontal distance equal to twice the height of the exposed rock from both the upslope and downslope limit of bare rock, except where

landscape-wide linear anthropogenic features necessarily intersect the scarp. Within urban municipalities this right is extended to cliffs of igneous rock as well.

*This article protects the sensitive habitats in the immediate vicinity of cliffs and steep screes.*

**8) Freedom from Introduced Species.** The biota of Ontario has the right to freedom from introductions of reproducing populations of exotic species, and from activities likely to lead to such introductions, except for carefully considered introductions for biological control of already introduced exotic species or for the early-successional amelioration of extreme anthropogenic disturbance.

*Introduced species often cause unpredictable ecological damage, and in any event they displace native species or change the character of the native biota. Implementation of this article might include the drawing-up of schedules of exotic species considered already introduced, allowed for agriculture, and forbidden as dangerous.*

**9) Freedom from Genetic Drift.** Every indigenous regional biotic population in Ontario has the right to freedom from anthropogenic reductions in population size which lead to decreased genetic diversity due to genetic drift, except in the case that the species is the pathogen (not vector) of a disease of People or a traditionally domesticated species.

*This establishes the genetic variability of a large interbreeding population as the standard of population size to be maintained in species whose abundance is reduced or threatened by human action.*

**10) Freedom from Over-Capitalized Exploitation.** No part, body, or product of members of an indigenous wild Ontario population may be sold commercially except where it has been demonstrated beyond reasonable doubt that each population harvested for commercial sale is able to sustain such harvest indefinitely, and where the money cost of vessels, vehicles, and other gear used in such harvest or capture shall not exceed the usual annual full-time net harvesting income of the party of harvesters using said harvesting gear. The meat, fruits, flesh, or parts of members of an indigenous wild Ontario population taken noncommercially for food shall not be sold, and shall be exchanged between People only as gifts.

*This article entrenches the principal of sustainable yield for all commercially exploited wild populations and sets a standard for the relative importance of labour and capital in the harvest of such populations. The great danger to wild populations since the commercial settlement of North America has been the overcapitalization of exploitation, in which corporations or individuals depend on wild populations to provide a steady and maximum return on investment, which they are intrinsically unable to do without depletion and collapse of the exploited population.*

## SECTION 3: Landscape and post-glacial history

***only the following unprocessed text, lifted from other contexts, is available for the beta edition of this book***

Limerick Forest straddles the Smiths Falls Limestone Plain, ancient Ordovician limestone which is only thinly covered by glacial till and outwash, and the Edwardsburgh Sand Plain <<need characterization>>. These sediments were shaped by the Champlain Sea, which filled the St Lawrence and Ottawa valleys after the Wisconsinian icesheet retreated. Isostatic rebound raised the land above sea level about 6,000 years ago. The flat topography and shallow depth to bedrock impeded drainage resulting in a landscape that included many types of wetlands. Hunting People occupied the land from its emergence, and Iroquoian agriculturalists lived here up to the time of European settlement.

Arable lands were settled by Loyalists in the late 18<sup>th</sup> and early 19<sup>th</sup> century: in 1792 Oxford-on-Rideau Township was the first township surveyed that didn't front on either the Ottawa or St Lawrence river. The marginal areas were settled in the late 1840s, mostly by Irish potato famine survivors. Andrew Forsythe, settling on a 200 acre tract of forest east of Bishops Mills, named his farm Limerick, after his old home in Ireland. "Inexhaustible" Great Lakes forests of Hard & Soft Maple, Beech, Hemlock, Red Oak, Elm, Black Cherry, Yellow Birch, White Pine and White Cedar were replaced by fields, but by the late 1800s repeated cropping and grazing had exhausted the soil. Exposed Champlain Sea dunes became 'blow sands,' turning much land into a desert of stony plains & dunes. From 1910 till after the Great Depression of the 1930s, whole families abandoned their homes, and with taxes due, ownership of the land reverted to the counties.

In 1975, our topography and shallow soils prevented the seamless agriculture that surrounds Winchester. An aging small-farmer population worked their land less and less intensely. High gasoline prices discouraged Manotick-like residential development aimed at Ottawa commuters, and the over-taxed sewage treatment plant checked Kemptville's evident desire for an increased human population. Kemptvillans were clamouring for Hwy 416, even naming tire shoppes after it. With capitulation to this popular clamour, all these factors have changed. Maintaining a diverse, benignly rural, ecology in the face of market forces is a challenge that is rarely met successfully, but may be achieved if the human community assigns it a high enough priority.

There are many consequences of the increased human population that the 416 is sure to bring. Ecological diversity is strained by suburban lawn-grooming standards, habitat corridors are broken by rows of houses along roads, septic systems introduce nutrients into ground water, heat pumps transfer ground water to surface flow, gravel roads are paved, production of garbage increases, increased traffic kills more road-crossing animals, and there are doubtless a thousand consequences that will become obvious only after the fact. The water of the Creek and River is already so rich in nutrients that minor increases may depress diversity.

Biological diversity is increased by the presence of many different habitat communities in a

landscape, and, within habitats, by patterns of disturbance similar to those which the species in the habitat have experienced in the past. The same kind of stability that enhances diversity allows communities to perform the full range of ecological functions, including primary production of food and oxygen, herbivory, carnivory, decomposition, mineralization of nutrients, symbiosis, maintenance of water cycles, nutrient retention, soil conditioning, prevention of erosion, creation of three-dimensional habitats, moderation of climate, and natural beauty. On the other hand, the characteristics of stressed ecological systems are losses of mineral nutrients, changes in primary productivity, reduction in species diversity, regression in successional stage, reduction in size of dominant species, and increase in disease or population fluctuation.

Since individual local populations often go extinct, more species can be supported when recolonizing organisms can move through a connecting network of appropriate habitat. Expanding habitats of low biological diversity degrades these corridors and threatens the whole landscape. The patches of wild habitats within settlements also suffer reduced diversity and setbacks in succession from human trampling, disturbance, and predatory pets. The first human occupants of a broken habitat may rejoice in a great variety of wild species, but many of these are 'living dead' that slowly disappear as mortality outstrips reproduction and recolonization.

In a settled landscape ecological health is allowed when a society does not reduce the landscape to a uniform most profitable use. A healthy ecology is usually due more to benign neglect than purposeful stewardship, as the shape of settled land seems to be determined by deeply-rooted cultural memories. Colonized land approaches the appearance of the ancestral African savanna, or of the old Middle East where agriculture developed. The regrowth of forests is suppressed; if trees would not naturally grow they are planted, and cultivated trees have the layered canopy of the African savannah. Dwellings cluster around water bodies and bluffs like those that may have provided food and shelter to the earliest humans. This image has congealed into the quickly built suburban habitat that rolls along roads and over the lands of retiring farmers. The expansion of settled areas is no longer mostly the result of individual decisions to erect buildings on land previously used for other purposes, but the job of specialized habitat-breakers who erect houses and other buildings for sale. They do not use what they build, but derive a life-long income from the expansion of built-up habitat. Like the Dutch Elm Disease, their effect on the landscape is far greater than the benefit they derive from changing it. In a 1995 public meeting about future 'development' in Oxford-on-Rideau Township, the construction industry spoke in favour of population growth, but private citizens unanimously questioned its necessity or benefit.

Our evolutionary history suggests that if settlements were planned to encourage the best personal development, people would live in groupings like an extended family. A nuclear couple with children spaced four to six years apart would share its home with one or two other adults. Families would associate with four to six other families, and the structure and placement of dwellings would define a space common to the group. Settlements would provide access to relatively undisturbed habitats, to strenuous exercise, music, and intellectual challenges, and would facilitate education based on personal tutoring and on play that mimics adult work. If increased population is to have any benefits, we must allow for a variety of human income levels and life styles, including those which exclude private ownership of motor vehicles. Those who

those not to own motor vehicles must not be cut off from the life of the community. All planning must come to grips with the fact that the official Canadian "poverty line" is similar to estimates of the maximum personal income compatible with sustainable human habitation of the Earth, so that, in the long term planning for a global future, we should regard this as a ceiling, rather than a floor, on personal income.

Few rural municipalities have responded to the threat of suburban subdivision quickly and forcefully enough to preserve rural forests and wetlands. New buildings and roads press inexorably inward, persisting agriculture intensifies, surviving natural areas are set aside as reserves, streams are managed to prevent flooding of newly-built human assets, and in a decade the landscape is crowded with human activity, with each parcel of land zoned into a specified single use. This is because 'rural character' has historically resulted either from economic stagnation or from human inability to subdue an irregular topography to uniform economic ends. Its essence is a diversity of relatively benign and overlapping human uses for the land, in a landscape in which relatively undisturbed habitats provide homes for a wide variety of wild species. Chorus Frogs, Upland Sandpipers, Loggerhead Shrikes, and many other declining species depended on such a landscape among traditional agricultural habitats in Grenville County. Rural areas are among the most attractive residential landscapes for People, but increased density of human residences, traffic, and services fundamentally changes the benign and overlapping character of human impact on the land and water. In suburbia the land is over-partitioned into innumerable parcels dedicated to tightly limited human activities, with wild species restricted to equally limited reserves. In a rich community with strict planning such a landscape may appear tidy and well-ordered, while in a poorer or laxly-planned community it will be simply squalid, but in neither case will it be rural.

Planning for 'rural character' cannot be prescriptive. We cannot decide in advance on a zoning scheme that will 'preserve' it: we must decide which conspicuous species will continue to thrive in a 'rural' landscape, monitor their abundance, teach each other about their significance, and modify our behaviour (and economy) to accommodate their demands as these become evident. We must systematically map geomorphology, soils, vegetation, and distribution of Animals, and clearly communicate the results of this mapping to the People of the Township. Without such mapping we don't have any clear idea of what we're planning for. We must also begin organized protection for wild lands, by establishing a committee, council, or trust to study and maintain the ecology of the Township. This group would see that habitats are adequately mapped, discuss with landowners the part their land plays in the ecology, diffuse this understanding through the human population by publications and teaching, and co-ordinate active instruments of ecological regulation such as stewardship agreements, conservation easements, and title to lands.

People don't naturally feel threatened by changes that occur at a rate of 5% or less per year, yet in 20 years this rate will change two thirds of an original condition. The automobile god is a master of gradual changes, brought about by a multitude of little benefits that, in the long term, turn out to have destroyed the character of the landscape, and it has reached out for us yet again. If some People are offended by some of the things that will need to be done if we are to avoid suffocation in its coils, they must realize that planning is about the regulation of otherwise

innocent activities that can cause problems if they become too frequent. On the long term thinking ecologically about the human occupancy of an area is the only sustainable or benign approach, but in the short term it often requires unexpected changes in behaviour from an economic system which has been ultimately based on the unsustainable exploitation of landscapes.

Eastern Ontario: young forests that we've got to rebuild, and flower and salamander -- need a culture of wetland restoration -- dark-sky -- shun UV light-traps and other lights that decimate night-flying Insects -- ecopassages -- ecologic corridors

it's about the great problem of getting nutrients and extirpated species into the mature forests that should be our richest biological communities, and should cover a substantial portion of any temperate landmass.

Life in the world is all about bgc, because it's the availability of nutrients that constrains primary productivity, and the quantity and quality of plants that constrains Animal life. As a representative of the 18th century, which saw agricultural fertilization as a problem of recycling the nutrients sold in crops back onto the land from which it came, and as a student of biological diversity and of human sustainability, I'm obliged to worry about the basic organization of nutrient flows in human-dominated ecosystems, and the question of where sitting on the Throne leads:

"Throne (n): the flush toilet as the heart of darkness, the nexus of careless one-way nutrient flow in nominally civilized countries. Through it passes most of the residue of the biological productivity of the acre of land that feeds each person: phosphate and potash dug from the earth, nitrogen burned from the air, minerals mined from exploited soils or imported from exploited tropical ecosystems, and fish netted from the sea. There is no socially accepted way to disperse the concentrated nutrients used by people back into soil: the disposal route for biological waste is always into groundwater, streams, lakes, or the sea."

Aboriginally, our forests were rich, and our waters were oligotrophic, since they drained uplands that made a net extraction of nutrients from precipitation. Now our algae-streaming waters receive nutrients from runoff over agricultural fields and from septic-shortcuts into groundwater, not to mention all the unfiltered influxes from the lawns and storm sewers of settlements, and sewage-treatment plants that flush (however apathogenically) directly into streams and lakes.

All of our nutrient-management decisions should be based on the idea of keeping nutrients in rich upland forests, so that they don't enter ground or surface water. We need this simple deduction from ecology and biogeochemistry accepted as an overarching idea, in the same way as the containment of pathogenic micro-organisms is accepted as a deduction from the germ theory of disease.

In the current socio-political climate, we don't have any immediate hope of getting a significant fraction of the night soil into the forests of eastern Ontario, but we mustn't lose sight of

something like this as the ultimate goal in any discussion of nutrient fluxes, and our lives in our own homes must be centred around nutrient management.

## CHAPTER 3: The Biogeochemical Homesite

**1 November 1985:** We have been a week at Liz & Garnet Goldsmid's in Prince George, and have been fed meat and potatoes and ice-cream and pie to repletion. Aleta paints at a sewing machine desk in the living room, between a wide picture window and a Jotul wood stove, and I have my computer set up on the kitchen table. Most mornings it has snowed a little, and most days the morning's snow has melted away before the next morning..

The house is 17.5x7.5 m (plus 1 m eaves on each side), and almost completely cuts the front yard off from the back. The front yard is 16x12 m, bounded by the house, an newly planted hedge of a 'red twinberry honeysuckle', the house, and driveway (these paralleled by flowerbeds), and the half-cylinder ditch along the street (this ditch & a soft-gravel shoulder 2.5 m, the road 8 m wide).

The back yard is 30x21 m, of which 5x22 m is garden, and the rest Weed 'n Feed lawn, except for a narrow border of flower bed along the fence (white-painted board), and a lattice-work wood bin 2.5 (high)x3x4 m wood bin, full of short chunks of coniferous wood from a clearcut on the Blackwater Road, S of Prince George. This is a little more than one winter's supply. Half again as much wood is piled along the side of the house, and at the other side of the lawn are a dozen or so narrow-board pallets, that are cut up for lumber and fuel. There are two compost heaps, one nearly full and the other nearly empty; their surface contents include: eggshells, banana skins, mouldy oranges, coffee grounds, rice, onions (skins & rotten), carrots (tops, peelings, rotten, and small), cabbage leaves and cores, rotten plums and limes, potatoes (rotten and peelings), pickled beets, celery stems, sweet corn kernels, apple cores, bread, tea bags, zucchini butts and cooked slices, grapes, and beet tops. Dog hair is excluded from the compost heap because it takes so long to decompose, and much left-over food is thrown out, for various reasons, despite the avowal that they "hate to waste food."

### SECTION 1: Getting ready for archeology

In Wildlife Ecology we learned that nutrients tended to be concentrated around the 'central places' of foraging vertebrates. While you're not trying to lose things through burial, you should think of your household as a tell, slowly accumulating sediment and nutrients into a shallow mound and a centre of biological productivity. This is critical for keeping bgc cycles local, which you do by growing as much of your own food as possible, sequestering nutrients in the soil in which you grow it, and preventing losses to groundwater, runoff, or erosion. In *Sand County Almanac*, Aldo Leopold's essay about the comparing the repeated cycling of nutrient atoms in primordial prairie with their short tenure of fertilizer-to-runoff in modern conditions, makes it clear that any reasonably mature land etc retains nutrients as tightly as possible.

Soil is the universal acceptor and recycler, a trickling filter for gas and fluid, and decay is a sacrament of replenishment. That's why one never puts anything organic into the landfill -- if neither you nor your livestock nor compost can eat it, put it under a board and a rock (with the freezer-burned Turkey carcass from Syracuse) in a place where a desired tree will benefit from its decay.

It's not just in 'third-world' countries that 'first-world' methods of recycling have displaced scavengers who reduced the amount of material buried. All across Canada the closing of local dumps, and their replacement by curb-side collection and centralized landfills, has crippled the household economies of those of us who could "usually find what we needed" at the dump. We

used to make it a rule to bring more back from the dump than we took to deposit, but since curbside collection and blue-boxes have come in, it's a purely boring one-way flow. Blue-boxing may lead to recycling, but scavenging is reuse, one significant step higher in the waste-reduction hierarchy.

You build your tell as you sweep the floor and toss it where it will be useful, rather than putting the sweepings into the landfill, and by thinking of particle size and nutrient content of everything you discard -- toss stones taken incidently with bottom samples into the driveway as gravel, if you need sand sweep the roadside in the spring after the County delivers it, .

It's important to think of livestock as bringing in nutrients with purchased hay and feeds, just as any sold export nutrients, and switch as soon as possible from the hidden underground corruption of a "septic system" to the apparentency of a composting toilet. Urine, as excreted is aseptic, and can be pitched into sites where nitrogen-rich fertilizer is needed to promote the growth.of foliage.

Architecturally: aim for the Metis single-room house with the functions around the periphery, so everyone isn't squirreled away into individual cubicles, but constitutes a community.

Learn the lessons of the Ice Storm:

- 1) don't depend on Hydro to heat your residence*
- 2) don't have your freezers inside where they'll thaw in a winter outage*
- 3) if you depend on an electric pump, draw sufficient water for each approaching weather system*
- 4) don't have heavy trees overhanging your roof*

## Section 2: Neolithic Gardening

Neolithic gardening, or semi-passive polyculture, recaptures the Edenic birth of the plant-human symbiosis before the "sweat of the brow" had entered the gardening equation -- when cultivation is a discovery rather than an obsession so that both planted and volunteer species are equally valued, and gardners puts most of their effort into harvesting. It depends on knowing the use of every species of voluntary plant, or weed, generous mulching, planting cultivars (as individual plants or in patches), where they'll do well, and constant patrolling to harvest each plant as it's ready, and then to shove the unharvested plants (except what's saved to sow next season's seed) into the Rabbits, hens, or Goats that are in the background to convert the pulled weeds into instant compost.

In order to garden in this way you've got to have repeated access to every patch of ground, so McIlwainin trench bedding gives the same access to a vibrant garden as rows do to an enforced monoculture. In general American vegetables are much more suited to anarchic gardening than European species that were domesticated in the aftermath of the ox-drawn plough. American vegetables were still in the neolithic at the time of contact, and with the genetic engineering of mesoamerica behind them, and the amazing productivity of the five sisters, it's no wonder the

inhabitants never felt the need to “progress” to a more authoritative mode of gardening.

Every household needs both a forager and a processor: the forager scans the gardens and hedgerows for wild and cultivated fruits, while the processor takes them in and processes them for consumption or storage. It's also her responsibility to ask after possible fruits in season, and curtail the influx of foreign foods when a harvest is expected.

Google-found references: Neolithic Garden of Eden, E. C. LUCAS, *Nature* 242, 355 (30 March 1973); doi:10.1038/242355b0 -- The Dyson Perrins Laboratory, South Parks Road, Oxford OX1 3QY. Collingwood, R. G., *Essays in Metaphysics*, 227 (Oxford University Press, Oxford, 1966). Albright, F. W., *The Biblical Period from Abraham to Ezra*, 5 (Harper and Row, New York, 1963). Pearce, E. K. V., *Who Was Adam?* (Paternoster Press, Exeter, 1969).

### Section 3: Lawn Care

Conventional lawn care is inextricably associated with boredom, but this isn't a necessary characteristic of controlled vegetation in the vicinity of homesites. Lawns began in the over-grazing of the fields around houses by Sheep, widely considered the most boring Mammal ever domesticated by the hand of woman.<sup>1</sup> Later, the game of golf was invented and played on lawns. In the late 19th century, lawns were promoted by landscapers as a way for boring middle class drudges to give the impression that their suburban residences actually housed an effete aristocracy. It's possible to classify this boredom under three headings: structural, biotic, and social.

**STRUCTURAL BOREDOM:** Many studies have shown that conventional lawns are the flattest habitats on earth. Despite frequently growing on moderately to extremely rich soil, their stature is homogeneously stunted. This flatness persists only if the managers of lawns scrupulously enforce it, and indeed, in neighbourhoods where lawns are prevalent, these managers can be seen hard at work for much of the growing season, stunting the stature of their grounds with a variety of boredom-producing machines. It is hypothesized that these machines work so efficiently that their otherwise offensive noise production is required to keep their operators awake.

**BIOTIC BOREDOM:** Little need be said here, except that conventional lawns are not the manufacturer's recommended habitat for Pseudoscorpions, *Dryas integrifolia*, Plethodontid Salamanders, Sandhill Cranes, *Asplenium* ferns, Spruce Grouse, Painted Trilliums, Marbled Murrelets, Chaetognaths, or Kelps of the genus *Nereocystis*. Not satisfied by the torpor produced by the absence of these taxa from their environment, the boredom boffins who manage lawns further reduce the interest of their acreages by attempting to suppress the growth of all plants except selected species or clones of Poaceae. Specialists certainly find this family challenging,

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<sup>1</sup>We assume here that the origin of animal-care responsibilities followed the current pattern: a woman brings home the Bird or Mammal over male objections, followed by the passage of months in which she goes on to other interests while he looks after it. This is why the care of domestic homeotherms is called Animal Husbandry.

but its tediogenetic<sup>2</sup> potential is shown by the way naturalists who list many other groups at the species level designate it by the laconic monosyllable ‘grass’ in their field notes and other writings. Still, most of the interest in the Poaceae is inherent in the florescences and complex gluming of the seeds, and the lawnsters, always striving to take boredom to its limits, fervently suppress or remove all of these reproductive structures. Many of them take this principle so far that they spread toxic tediogenetic chemicals on their lawns, at the cost of greatly increased carcinomas, leukemias, & other malignancies among themselves, their pets, & their children. It is surmised that by precluding walking, running, or foraging on the lawn, they maximize the boredom derived from it. It has even been suggested that some managers hate the delicious mushrooms (e.g. *Marasmius oreades*) that seem to have decreased in abundance in recent decades under tediogenetic treatment, because the rings of nitrogen-green grass associated with the mushrooms are less boring than areas where they are absent.

**SOCIAL BOREDOM:** The idea of writing about lawn care originated in an attempt, in the summer of 1997, to keep the grounds of the BCKCDB lawn-like enough to deter territorial incursions by neighbours riding self-propelled boredom-machines, and to generally avoid social obloquy in a lawn-worshipping village. It proved impossible to get around to mowing the lawn more than twice in the summer, despite the fact that the staff were present for most of that time, and that the mower (the sixth in a long and ineffective series) only broke down once. Nonetheless, nearby lawn worshippers were observed to find time to mow their lawns repeatedly, *often before the vegetation had made any perceptible growth!* Not being privy to the indoors activities of these individuals, we cannot speculate how their lives come to be so devoid of incident and responsibility that they are obliged to pursue a maximally boring pastime in order to stave off alternative activities, which we can only suppose must be something similar to unconsciousness, television, or death. *“Isn’t it nice that our lawn is still so short — lets go cut it again.”*

Conservation of biological diversity requires a maximal number of species in each lawn, and marked floristic & faunal diversity among lawns both within a single household & across landscapes & regions. ***This contradicts the frequent practice of removing most species of herbs and Grass by weeding or biocides.*** Maintaining genetic diversity requires frequent sexual

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<sup>2</sup>It is an established principle of the English lexicon that while a native words may be tolerated as nouns, the corresponding adjectives must be formed from classical loan words. Thus, *while the land is overgrown with terrestrial species, the sea swarms with marine life.* For discussion of conventional lawn care these resources have not been available, so I have had to provide classically derived adjectives related to boredom. Since taxonomists are experienced in forming new words from classical roots, I polled the TAXACOM e-mail list and received multiple independent responses forming variants of “tediogenetic” from the Latin “*taedium vitae*,” “the weariness of life” (“*as a federal biologist and taxonomist, I feel uniquely qualified to coin a word for ‘giving-rise-to-boredom,’*” John C. Kingston; also Hervi M. Burdet, Kristian Fauchald, & Bill Owens [via Philip D. Cantino]).

While boredom was a fact of Roman life, classical Greek authors didn’t have much time to be bored, nor an effective vocabulary for boredom. Bill Merrill of the Perseus Project suggested combining “aluo-” from “alus” to make “aluogenetic,” but this Greek boredom would not be recognized by lawn-lovers, since it occurs only in such situations as Achilles dragging Hector’s body around Troy, Odysseus putting out the eye of Cyclops, and, in Aeschylus’ *Seven Against Thebes*, warriors “craving battle, like some charger that fiercely champs at the bit as he *waits* in eagerness for the trumpet’s war-cry.” In Dutch, according to Albertine C. Ellis-Adam, University of Amsterdam, “*pogonogenic*” is already used, based on a Dutch expression that denotes boredom and loathing as something ‘that makes one to grow a beard,’ but the alternative to beard accretion (shaving) is confusingly similar to conventional lawn care.

reproduction by populations of lawn plants. Ecosystem condition and productivity are maintained by not-too-frequent episodes of disturbance, ecosystem resilience is demonstrated by succession in disturbed patches, biomass production is maintained by patchy fertilization, and erosion is eliminated by, and water infiltrates through, an open soil structure. ***These ecological considerations contradict the assumption that lawns have purely visual, tediogenetic, functions.***

When foraging is at the heart of lawn management, the lawn obtains important heuristic value as a living model of human exploitation of any biotic resource. If you harvest a species without allowing it time and space for growth or reproduction, it inevitably declines until you give it some protection. You will see the fate of the Passenger Pigeon or Atlantic Cod in the Dandelions or Lambsquarters in your yard: formerly innumerable, they become — just when you’ve become dependent on them — so scarce that you have to hunt through numerous patches to gather a handful of salad. They only recover when you back off, balance your foraging pressure, and allow each desired species to grow and reproduce. As Thoreau wrote of *Wild Fruits* “It is a grand fact that you cannot make the fairer fruits or parts of fruits matter of commerce; that is, you cannot buy the highest use and enjoyment of them.... Better for us the wild strawberry than the pine-apple, the wild apple than the orange, the chestnut and pignut than the cocoa-nut and almond, and not on account of their flavor merely, but [for] the part they play in our education.”<sup>3</sup>

If lawns are to benignly influence the human impact on global ecological cycles, a minimum of manufactured resources must be used in their care, and their products must displace materials & food that would otherwise be purchased by the household. ***This contradicts the conventional practice of importing fertilizer, peat, & biocides onto lawns, expending fossil fuels in their care, not using their products as food or mulch, and exporting their production into the municipal waste stream.***

***Conventional practice denies that lawns provide multiple benefits to either society or the household,*** acknowledging only flatness and boredom as acceptable benefits. Sustainable lawn management regards flatness as a tool and denies that boredom is a benefit. It emphasises the nutritional, floristic, health, and horticultural benefits & products produced by a working lawn. Since sustainable lawn management is the joint responsibility of government, industry, and Canadians in general, it ***denies that individuals & institutions have the right to export the noise, air & ground-water pollutants, advertising, and harassment of neighbours produced by conventional lawn management.*** Lawn monocultures are illegal, incidently, in countries, such as Canada, that signed the International Convention on Biological Diversity, whose preamble affirms ***“the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components,”*** and notes that ***“it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at the source...”***<sup>4</sup>

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<sup>3</sup>Thoreau, Henry David (edited by Bradley P. Dean). 2000. *Wild Fruits: Thoreau’s Rediscovered Last Manuscript*. W.W. Norton & Company. New York. xvii+409 pp. p. 5. The present document can be understood as an independently conceived (first published draft 1998) modern analog of *Wild Fruits*, dealing, however, with the vegetative, herbaceous productions of an Eastern Ontario homesite, rather than the sexual products of eastern Massachusetts woods, swamps, and oldfields.

<sup>4</sup>D. E. McAllister, pers. comm.

With this background we are now able to consider how these criteria are to be implemented. Curiously, the motivation which produces a lawn unconventionally closer to the principles of sustainability is *simple culinary and horticultural greed*. The working lawn is managed to produce, with a minimum of effort, a wide variety of *products* in each season. Institutional greed has led to widespread monoculture and devastation in many habitats, but this is a greed that has been passed through a unidimensional fiscal filter, whereas we seek diverse products for ourselves and our vegetative & Mammalian symbionts. To obtain these benefits, we find it helpful to:

1) *Understand mowing as an ecological experiment, not as an attempt to produce a predetermined appearance.* The aesthetic product of mowing is flatness. Flatness has a compelling appeal, as anyone who has dragged a mower across a ragged stand of vegetation is well aware. Attempting to additionally impose a floristic monoculture destroys the distinctiveness of the edaphic, successional, and micro-climatic factors which are revealed by mowing, and dilutes the effect of the flatness, which obtains its force from the morphological variety of the leaves and stems of the species reduced to a common height. Just as many natural activities can become compulsive behaviour in individuals deprived of adequate stimuli of other kinds, the thrill of producing flatness can evidently metastasize, in the addict, into the boredom of mowing already flat areas. We mow to see what our land will grow when it is mowed, rather than imposing an *a priori* notion of what flatness should grow. Once the lawn has been cut, you should rejoice so fully in the diversity and usefulness of its regrowth that you are reluctant to cut it again.

2) *Use piles of wood or parked vehicles to produce patchy devegetation.* It is our experience that diverse seasonal obligations ensure that this will happen anyway, so we might as well call it a lawn-care principle that promotes the growth of edible annuals. At the BCKCDB the predominant species in such patches is Lambsquarters (*Chenopodium album*, and relatives), but most annuals are edible. What comes up when you finally move that trailer or get that pile of slabwood into the shed will almost certainly be delicious, though different weeds are dominant in different places. At the BCKCDB, Purslane (*Portulaca oleracea*), for example, widely revered as a premier potherb, is devastated by a mining insect that hollows out the leaves, but Lambsquarters comes up wherever the ground is disturbed.

3) *Fertilize with the osmoregulatory effluvium of the household.* Conventional sewage and septic systems drain nutrients off the land and flush them into rivers or ground water, where the oligotrophic native biota is unable to process or use them. When households do not recycle wastes onto their land, the vegetation around human residences takes on a pinched, pale, nutrient-starved appearance, quite different from the lush growth that thrives around those households that accumulate urine and pitch it onto lawns or other sites where enhanced growth is desired. Nitrogen-rich fertilizer can promote shoot and leaf growth long after it has stopped in unfertilized areas, an effect that is particularly valuable in patches of annuals growing on previously devegetated sites (this treatment must be diluted with water, of course, when the soil is otherwise dry). Unlike their owners, Dogs already contribute freely to the lawns where they

live, and these contributions can be constrained by fencing, or transferred to appropriate areas with clamshell poop-scoops.

4) *Mow around shrubs and patches of seasonal, useful, or beautiful herbs, and let herbs and Grass mature seed.* Anyone can mow around a shrub that they have planted themselves, but those who look ahead of the mower also spare volunteers of edible, interesting, or conspicuously-flowering species for a season or a few years. One must also resist the tendency to show off patches which have escaped under-pile devegetation for a decade or more and consequently mow down to an especially carpet-like flatness. These patches are the old-growth of the lawn, and if they are always cut, the species characteristic of mature turf will never produce seed. Then the seedbank of the lawn will contain only weedy species from the devegetated patches, and seeds will not be available for successional progress. Allowing a square metre or so of late-successional Grass to mature seeds will improve the seed bank. The seeds can be dispersed in the draft of the mower once they are mature.

5) *Use the draft of the mower to move nutrients as well as fixed carbon around the lawn.* Any patch of lawn grows in proportion to the nutrients in its soil, but after mowing, the nutrients in the cut material can be re-deposited where it grew, moved across the lawn in the draft of the mower, or raked up for export as mulch or fodder. Mowing and letting the clippings lie evens out the distribution of nutrients (a useful effect in Dog-dotted areas). Exporting clippings exhausts the soil and reduces the growth rate of the lawn, while blowing clippings into patches of subsidized plants promotes their growth. Nutrient management of a lawn is largely a balance between promoting growth of desirable species, and impoverishing the lawn to reduce growth in sites and seasons where nothing but Grass would grow; much of this movement of nutrients, promoting either homogeneity or heterogeneity, can be accomplished by directing the deposition of clippings. Many lightly used areas need be mowed only once each year, to hold back succession both by cutting woody plants, and by removing nutrients in the clippings.

6) *Remove plant material from the lawn only when a useful product or effect is produced.* This is similar to the fundamental evolutionary and economic principle variously known as the 'law of least action,' 'if it ain't broke don't fix it,' 'what's in it for me,' 'looking out for number one,' etc.

6.1) *Harvest spring greens for human and livestock food.* On a day early in May it becomes obvious that the festival known as '**Eat Wild Herbs Day in Bishops Mills**' has arrived, ushering in a month when our salads are cut from the lawn with little addition of store-bought or garden vegetables. At this time, before mowing, we keep down early areas of tall Grass by pulling or scything armloads to feed to Goats, fowl, and Rabbits.

6.2) *Take first cuttings for Animal food and garden mulch.* Before mowing the lawn, cut the first growth of grass with a weed whippers or scthye, and dry this as prime hay for winter feeding of livestock. After the first flush of spring growth, a little before farmers take their first cutting of hay, we mow areas where heavy Grass impedes free movement and where edible plants are not dominant. This produces useful amounts of 'plant material' (to borrow the felicitous phrase

employed by Ed Lawrence on CBC's *'Ontario Today'*) which is deployed to suppress weeds and feed subsidized plants. Power mowing under these conditions is, of course, anything but boring. It's a sort of co-polymer of mystery with hard work, punctuated by moments of sheer terror. You discover forgotten stumps, holes, firewood and tools, and there's nothing like a decomposing calf's skull hidden in the grass to interrupt the roar of the evening's mowing with a shattering crash and a rattling spray of tooth-chips, followed by sudden, shuddering, silence.

6.3) *Repeatedly mow only heavily used areas.* Most of the lawn will continue to produce herbs through the late spring, and the lawn need only be cut where the herbs are not producing useful products, or where Grass is an impediment to movement. In interactions with relatives and neighbours it helps to define 'mowing the lawn' as the completion of a circuit around unmowed areas. At the BCKCDB a figure-eight pattern runs around two buildings and other obstacles, and when both loops of this have been closed, we say that the lawn is 'mowed,' even if some parts of the loops only one mower-swath has been cut.

Grass can be suppressed, though it seems to be a largely forgotten art, by methods other than motorized mowing, and all these methods have desirable by-products. You can't kill the fatted lawnmower when someone comes to visit ("Uncle Ray, would you care for a slice of crankshaft to go with that scrambled carburetor?"). Goats will not graze Grass they have previously stepped on, but Sheep have no such scruples. Weed whippers, scythes, and other hand tools can be used to harvest Grass as it is needed. When the lawn has been cut once, a hand-pushed reel mower with a grass catcher is a very effective means of harvesting clippings. With the incentive of feeding the harvest to appreciative beasts, even hand-pulling of especially lush growth will prolong the interval between mowings. Geese (which maintain the lawns of Lake Ontario's waterfront parks "with pastoral contentment and serene confidence"<sup>5</sup>) graze Grass to a level sward. Chickens will also graze a lawn down, though they tend to also dig holes for dust-bathing.

6.4) *Take a final fall cutting for mulch, and store autumn leaves as livestock fodder.* Goats and Rabbits, at least, are both fond of fallen tree leaves as food during the winter, so it pays to cut the lawn for mulch before the leaves fall, and rake up the leaves and store them for fodder. Both of these activities drain nutrients from the lawn, which may need to be replenished by targeted contributions through the winter.

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<sup>5</sup>Karstad, Aleta, Frederick W. Schueler, and Lee Ann Locker. 1995. *A Place to Walk: A Naturalist's Journal of the Lake Ontario Waterfront Trail*. Natural Heritage/Natural History, Toronto. p. 38.

## CHAPTER 4: *Every species belongs to itself*

**Subject: Re: Today in Our Canyon**  
**Date:** Sun, 17 Jun 2007 16:57:17 -0500  
**From:** Aleta Karstad <karstad@pinicola.ca>  
**To:** Lars Karstad <lkarstad@shaw.ca>  
**CC:** <karstad family list>

Dad, I am very impressed with the thoughtfulness of your wildlife observations. You learn a lot by thinking about what you observe! I was thinking in particular about a discussion of 'nature consumption' - one of my bug-bears recently is how much nature-viewing is done with no recording of observations, and little regard for the cost (environmental or ecological) of the viewing events, which are mostly regarded as an end in themselves (good for the soul, like a vitamin pill is supposed to be good for the body). If people don't think they can learn anything special from what they observe, they won't. And if they do notice something interesting, they usually don't consider whether it may be information that might be of use in the conservation of the very Nature they are enjoying. I particularly appreciate your Owl observation. Everything is in a community, sometimes an altruistic community, and sometimes an adversarial community, and the movements of humans have an effect, one way or another, on more than they realize.

Our Volvo wagon was struck by a distraught Whitetail doe (her fawn turned back into the field) a couple of summers ago - the policeman who was called to the scene said that this was probably the same doe who had lost one of her fawns to some motorists, whod picked it up on the highway where it was confused, and taken it home (illegally) to keep as a pet, supposing it was an orphan - the doe had been known by local people to have had twins. How to educate people? By making a movie for public distribution (or a TV documentary) of how a doe manages her fawns? I love your careful watching and waiting, and putting two-and-two together. I wonder whether there will be any further observations of that particular family..... -- Love, Aleta

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> *Hiking in the canyon today, I came upon a doe mule deer with a fawn. She walked slowly away from me, the fawn following, stopping at intervals to see if I would follow. I just remained still and enjoyed seeing that she seemed to allow the little one a surprising, to me, amount of liberty. He tired of tagging along with mother and dashed off back in the direction they had moved, back toward where I had first seen them. Then he came back, nuzzled her udder a bit, then pranced off up the rather bare hillside, toward the houses of some of our neighbors, that are a continuation of our line of homes along the canyon rim. I don't exect he would go as far as the rim of the canyon, howver---but I saw no more of him, while his mother slowly made her way up the valley and out of sight in the bushes.*

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> *My photo shows a raised scar on the upper left hind leg, or lower rump. The right side, which you can't see has a large area of white hair in the same position, such as might be caused by scarring. I suspect that this doe, if she could talk, could tell of some harrowing experience of her*

own, perhaps in escaping a predator.

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> I then continued my walk along the path, coming within closer sight of where the deer had been when I first saw them. There on the ground, lying flat on his side was what seemed to be the twin to the other fawn. I thought at first that it must be dead, as it lay so still. Then I think I saw a forelimb twitch, and walking closer, until I was only about 20 steps from it, I stopped again and looked closely with my binoculars. It was breathing! The little rib cage fell and rose in regular sequence. So I assume it was just having a very sound sleep. I went no closer, as very young deer often have a tendency to follow any large moving body, and I didn't want to cause a problem.

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> Then I recalled that Tess, one of the ladies in this community that is a painter, had been in touch with Martha recently to enquire about use of our clubhouse for painting session. She had phoned again about 3 evenings ago to ask my advice about a deer fawn that had been found running back and forth inside a field nearby. It had been taken in by a neighbor and put in a cage and they wanted advice as to what to do with it. I told them that as it is illegal to keep a native wild animal, they must call the conservation officer at once and that he would decide what must be done with it.

>

> The next day, Martha phoned Tess about the painting group and Tess told her that the deer had been in the cage (it was near the road) and that she had passed by and saw that the cage again contained domestic rabbits, as it had formerly. She didn't know what had been done with the deer.

>

> As I looked at this little sleeping fawn, I noticed that one of the lower forelegs seemed swollen and that there were darkened, scraped areas of skin on its head, upper neck and ears, marks that indicate to me that I was probably looking at the same fawn, and that it had suffered these injuries while confined in the cage. Apparently it had been released and found by its mother, and that the doe had twins. They were just several hundred yards from where the fawn had been caged. I hope the little fellow survives. I intend to go back to that area, perhaps tomorrow, to see if it is still there.

>

> Continuing on down the trail, I came upon a pair of flickers and a pair of humming birds harassing a great horned owl. The flickers were mainly out of sight in the canopy of birch leaves but they kept up a continuous squawking call, quite different from the usual calls one hears from flickers. The humming birds just darted and hovered around the big owl, coming within a metre! I took some photos but they are not very good, the owl in shade and my camera pointed skyward made for the usual problems with backlighting. As I left that unhappy gathering, I met a raven, flying low over the creek, no doubt heading up to give the owl further problems! Perhaps it is all because I came upon the owl, perched low near the trail and he then flew up to a higher position in one of the big water birch trees along the stream. I can well imagine that owls have a difficult time keeping hidden during the daytime. It seems that so often when I find an owl and it is caused to move, this is in general what happens. The scolding and harassing birds can be almost any other avian species, as they all seem to dislike owls.

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> *I was asked to awaken Martha this morning, in case she slept in, so that she could be on the road early to go help a friend in Peachland who was holding a garage sale. Well, I got up at 4:45 to go to the bathroom, decided that was too early to call her, so I went back to bed. But before I did, I looked out the window and in the half light of dawn, there stood a young buck deer. He saw the curtains move and slowly walked away and down into the canyon.*

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> *When I awoke, at 7:15, I found I found a note from Martha saying that she was leaving for Peachland---at 7:00! -- LK*

## **SECTION 1: Radical Biological Egalitarianism**

begun Sun, 12 Jan 1997

Reflecting on how different People misunderstand our motivation for our work, we realized that the misunderstanding was based on their failure to appreciate that our work as naturalists is rooted in our insistence on valuing every species we may encounter, as much as we can, equally.

When Aleta painted a poster for the Canadian Biodiversity Institute, (Karstad, Aleta, Heather Hamilton, and Frederick W. Schueler. 1995. *Every Species Belongs*), one draft of material for the back of the poster spoke strongly of what we have come to call radical biological egalitarianism: *"Trees have always stood as a metaphor for the unity of life, an image that is reinforced by the branching pattern of lines of descent in which we see their origin, and by which we classify them. In the flowing lines of the branches of a Willow-like tree I have arranged the easily visible animals, plants, and fungi that we live among. Each could have the status of a personal totem, but seeing them all together I realize how focusing on familiar species limits our perception to a fragment of life's actual diversity.*

*"Surrounding these familiar forms I have drawn a ring of all the known living phyla, the first category in the Linnaean hierarchy of classification below the Kingdom. Phyla are characterized by fundamentally distinct structure or ways of life. That some of these have not been given formal names as phyla may be evidence of that a fragmented view of life afflicts even the People who classify it...*

*"A few phyla in this ring are world-dominating, like Arthropods (Insects, Crustaceans, and Arachnids), Chordates (Vertebrates), and Flowering Plants, while some are known only as a single rare species. Biodiversity is made up of both the fundamentally different designs of the higher taxa, and the infinite changes on the designs of a few dominant taxa. Our visible world, represented by the painted animals, plants, and fungi, is encompassed (in this narrow ring of stylized shapes) by an overwhelming diversity of kinds of creatures, most of which I have never known, and will never see, though we are all part of the thin film of life on the surface of the Earth.*

*"There are some extinct phyla, though paleontologists are reluctant to give this status to peculiar*

*fossils that may deserve it. Some of the oldest living phyla of Procaryotes, the Archaeobacteria, likely date from the dawn of life on Earth, 3.5 billion years ago. More than 2 billion years ago some bacteria began to live inside each other to combine their talents as the nucleated eukaryotic cell, the Kingdom Protocista, algae and protozoa. An explosion of multicellular morphologies during the Cambrian, 550 million years ago, produced all the phyla of Animals that might be expected to fossilize. Canada's most important fossils, the 520 million-year-old mid-Cambrian Burgess Shale fauna, contains several extravagantly designed extinct animal phyla. The Fungi, which might be expected to escape fossilization, are known only since the Silurian, 438 million years ago, and Plants evidently arose during that era. The Flowering Plants, which transformed the world's vegetation during the Cretaceous, 144 million years ago, are the youngest phylum whose origin can be inferred from fossils.*

*"Our human lives are profoundly though intangibly supported by the ecological stability that comes from the diversity of life on Earth. People have always had the power to affect this balance by destroying some species and cultivating or introducing others, changing landscapes, or releasing pollutants. Only over the past century and a half have we begun to realize that our actions can change and destroy much more than we at first intend, and that our kinship with other species elevates them from the status of resources and chattels to that of partners and mentors. Every living thing belongs to itself, and only if we know and respect their diversity will we deserve to persist on the Earth."*

Recently [1997] Aleta spent a morning with a representative of an NGO devoted to preserving biodiversity, hammering home the idea that all species must be considered as equals, especially in the work of a biodiversity organization, and finding that, while the representative accepted this idea intellectually, she didn't have burned into her heart, as we do as long-time museum collectors: all species are equally valuable, no matter how closely or how distantly they are related to People. Her fancy turned to endangered Birds, and large Mammals, and colourful coral reef invertebrates, and she despaired of communicating to the public that a 1 mm eastern Ontario Pupilloid landsnail, which appears to differ from its congeners only by the absence of a single apertural tooth, is as much and as worthy a natural individual as the Grizzly Bear or the Peregrine Falcon or some rain forest tree teeming with potential insecticides and cures for cancer.

Some time in the century before Darwin, naturalists made the leap from instrumental interest in other beings – early herbals are all utilitarian -- to disinterested love for the objects of their study. More abstract students had earlier loved their fields of study, but naturalists came to love their subjects. Alexander Rosenberg, in *Instrumental Biology, or The Disunity of Science*, 1994, argued that while the easy sciences can develop laws that reveal the structure of natural phenomena, biology is fated to be a practical, instrumental discipline, and that biology and the disciplines that rest upon it must aim at most to provide practical tools for coping with the natural world rather than a complete theoretical understanding of it (modified from the publisher's blurb). But he attempted this proof-by-omission-of-the-country by never mentioning the love-based disciplines of natural history, phylogenetics or systematics, as if biology were composed solely of various bio-technologies.

Reflecting on this we realized that the basis of all our interactions with the outside world is radically premised on biological egalitarianism, the belief that our actions must be based on the principle that each species is as valuable as any other because each is descended from a common ancestor with modification by natural selection, or because each is made by God the Father, whose Creation is uniformly Good.

The conventional view of the differences between these theses is greatly reduced by recognizing that scientific progress since Copernicus has been a continuous realization of the non-centrality of People's concerns, just as Judeo-Christian religious progress since Abraham has been a continuous realization of the importance of humbling one's self in one's personal life and the embodiment of the divinity as the suffering servant. These intellectual traditions come together in the realization that Christian principles are so true that People have been able to understand the physical and living world only by unwittingly incorporating Christian principles into the methods of science as the self-sacrificing hypothetico-deductive story that is true only to the extent that it is willing to lay down its life for the Truth.

It's no surprise that God the suffering servant would have made the World through (or as) the endless ages of apparently pointless natural selection, or that the method that reveals the history and mechanism of the world should embody this same pattern of sacrifice and survival.

One consequence of radical biological egalitarianism is that --- however affiliated we may be to non-naturalist People individually --- politically and ecologically we have to regard most of them as a lineage-murdering, self-centred beings who may inhabit and abuse the Earth, but who can scarcely be said to live here. For anyone to say that one species is more important than another appears to us a confession of willful ignorance, and this is why almost all the activities of contemporary society appear insanely anthropocentric to us.

Radical biological egalitarianism is the underlying creed of the naturalist, and adherence to it is what distinguishes our naturalist friends from other People we know. Nothing said directly in everyday conversation or writing directly distinguishes these classes of People, largely because naturalists have moderated their respect for other species in the hope of assimilating non-naturalists to their cause, so we can't say how extensively naturalist and non-naturalist views grade into one another. Few naturalists are able to distinguish species of Ants and soil Bacteria as clearly as they can Birds and trees, but they all wish they could, while commercial and anthropocentric People don't care. A local store-keeper isn't even willing to take a virus' point of view toward the symptoms of colds, which are life-and-death to the virus, but merely a nuisance to her.

Ever since our first book (Karstad, Aleta. 1979. *Canadian Nature Notebook*. McGraw-Hill Ryerson, Toronto. 144 pp.) we have, over the objections of editors, capitalized the English names of species. Increasingly, we now capitalize the names of all taxa which are monophyletically descended from a common ancestor, because these are proper nouns. The recognition of species as historic individuals is an important advance in the philosophy of biology over the past twenty

years. We capitalize names to recognize monophyletic groups as evolutionary individuals, and because this usage is the same that English uses for groups of People. One can become anglophone or a social democrat by acquiring skills or beliefs, but one can only become English or a New Democrat by birth or joining a particular institution.

Lower-casing species is an assertion that they are classes of objects that could be made up anywhere or anytime, a convenient fiction for those who wish to ignore their significance. Capitalizing names is an assertion that species are individuals with a particular historical origin, duration, and extent. It is perhaps significant that among North American Animals the main proponent of lowercasing names is the American Fisheries Society, with exploitation embedded in its name, while the main proponent of upper-casing names is the American Ornithologist's Union, the first advocates of a taxon of Animals to band together for their taxon's own sake.

Radical Biological Egalitarianism increases human equality by insuring dependence on others to know the taxonomy of groups other than the few each individual can know. Everyone specializes in a different subset of taxa, so to name most organisms you must always turn to others, as they must turn to you to know your groups.

Governments and commercial society seem only interested in the species that are so rare that worrying about them won't have any impact on the vast majority of the landscape, while I'm only interested in the species that are common enough to occur at a lot of sites. --- when they say 'biodiversity' they just mean rare stuff. (See p 29, EOMF Phase II Setting the Stage for Seven Generations).

What a naturalist values is bio"**diversity**." You don't get the feeling that the intention of studies, and goals, etc. such as this is going to actually value that kind of richness or any recognition that exploitation and boundaries (classification) are the problems. You get the feeling that they're trying to emulate a no-boundaries gradient-defined kind of world by putting in an infinite number of new boundaries and classifications. Like you can't understand Animal behaviour by dissecting a dead one --- or like making communism work by putting in lots more layers of bureaucracy.

Two meanings of biodiversity: Naturalist: biotic diversity, keep as many native species as possible as equi-abundant as possible, to approximate wilderness as closely as possible. Rare species have little effect on biodiversity...

Exploiter/apologist: Protect a few species already certified as endangered as particular efforts in limited areas, while continuing to unbalance wide areas in the course of unthoughtful exploitation of a few species.

Users of ecosystems who really care about biodiversity won't be afraid that they'll be committed to total hands-off reserves for all populations. Or avoid studying them for fear of having to account of them in trying to 'manage' the land --- but they do study them in their natural balance in the landscape so that 'management' may consider their needs not only the needs of rare and endangered species.

## SECTION 2: Pay the wild tithe

Countries and provinces are urged, and have largely agreed, to reserve 12% of their land area as ecological reserves, in order to allow wild ecosystems to survive in a world dominated by human occupation. At a smaller scale, many land holders want their land to contribute to the health of the local landscape by providing habitat to a wide variety of wild species.

Anything People do to their land is an ecological intervention, and one decade's 'habitat improvement' is likely to be the next decade's ecological abuse. Leaving a tenth of one's land completely free from any kind of management or intervention, in order that natural succession and other processes can run their course, allows that land to change in response to purely biological, climatic, and accidental influences, accumulating biodiversity maximally different from managed habitats.

**With a *Wild Tithe*, land-holders and their children can see how the ecology of managed land differs from untamed growth. No trees or other plants are cut, no animals killed or displaced, no pesticides applied, and trampling is minimized. The *Wild Tithe* can be set aside in the midst of a managed woodlot, a corner of a suburban lot, or in the narrow strip of soil behind a city building. This tribute respects the integrity of natural processes, and increases the overall habitat and bio- diversity in the landscape.**

There is, however, and overwhelming human temptation to meddle. Leaving something alone is the hardest trial of all for the monkey-bred brain. We've set aside the *Acer negundo* Grove beside the Goat Yard as the Wild 10% of the Pipers House lot, but we find ourselves not only harvesting Knothole Oysters from the trees, but also insidiously whacking out stems of Buckthorn, planting native forest floor herbs, and feeding on, and supressing the reproduction of the invasive Honesty, *Lunaria annua*, which seems to be working to emulate its Garlicy cousin in dominating the undergrowth with root-secreted mustard oil.

The idea of the Wild Tithe was originally sponsored by the BCKCDB and the CBI, for the workshops which heralded the Conservative Government's restoration of the Managed Forest Tax Rebate, in 1995. It was not surprising that the hubris of meddling overwhelmed any vestige of faith in natural processes, and that after a couple of years the tax rebate programme wouldn't accept "do nothing" as a plan.

## Section 3: Species totemization

**Abstract:** The reporting of scientific research downplays the emotional content of the subjects studied, but once we begin to use scientific results to try to change other people's behaviour, we've got to both acknowledge our emotional involvement with our subjects, and then try to use that involvement to try to evoke an echo of our commitment to our beasts among those who

would otherwise kill or ignore them or degrade their habitat. I suggest that it may clarify our thinking and educational activities to compare the empathy of the specialist with the creature studied with the 'totem' concept of shamanic cultures. I will discuss three sorts of herpetological totems: **Personal totems** are those species we've worked most intensely with and understand most clearly, so that we feel compelled to know everything that is done with them, and eventually become, in an inversion of the old shamanic relationship, the species' protector and advocate against human ignorance and destruction. In an era when children often have severely restricted exposure to wild herps, one goal of education must be to facilitate the totemic experiences that will make naturalists of previously TV-bound youngsters. **Conceptual totems:** we need to identify the ecological and evolutionary lessons that are most clearly taught by particular species, and push these in educational programmes as emblems or totems of these **processes** - Leopard Frogs represent landscape-wide habitat connections, Jefferson's complex *Ambystoma* represent species-level complexity, Green Snakes represent cryptic coloration, and Rattle Snakes represent dependence on limited hibernacula - but this has to closely follow the most recent research to keep from becoming repetitious and silly. **Locality (including seasonal) totems:** may be either regional totems - especially characteristic and vulnerable species that characterise a whole region, as neotenic *Ambystoma tigrinum* do for the Okanagan, or species that use particular sites in particular seasons, like winter Mudpuppies below the dam at Oxford Mills. In Canada many of our populations persist only because of peculiar juxtapositions of habitat patches, and much of our conservation effort goes into raising public awareness of what goes on at particular sites: road crossings, breeding congresses, foraging areas, and hibernacula, and protecting these from wanton or unwitting destruction. There's plenty of room for improving our own understanding of the environmental triggers of seasonal activity, and in the course of doing so, communicating the possibility and joy of observing these activities to narrowly focused, bird-&-flower-struck naturalists and the non-naturalist public.

## Section 4: Species accounts

By rapidly changing conditions, we've also accelerated the dominance of fellow trickster species in settled areas: Raven, Coyote, Red Squirrel, Jays, Geese, Grackles, Rats, Mice, Callipterate flies, Hymenoptera, Compositae, Bufo, *Rana pipiens*. In dealing with animals, you've always got to live in the tension of combined sympathy of a Lorenz with the dispassion of a Skinner, so that you see a Leopard Frog "leaping as if startled by the sudden onset of heavy rain."

*Species accounts are not assembled for the beta edition of this book.*

## CHAPTER 4: Prospectus for a Benign Science of Economics & for Household Economies

Frederick W. Schueler - (derived from *xianecon* for the Faith & Science Study Group, Kemptville, Ontario, 15 August 2000)

*Most of our discussions of Faith and Science have centred on the well-defined sciences – cosmology, quantum physics, and evolutionary & laboratory biology – especially where the findings are at least not determined by human values, and investigators with different values characteristically reach similar conclusions. No matters of religious significance appear to be included as axiomatic foundations of these fields, allowing Stephen Jay Gould to at least satisfy himself that religion and science occupy ‘non-overlapping magisteria.’ Social sciences come closer to treading on religious toes, and one would-be ‘science’ goes so far as to premise itself on ideas about human behaviour that any religious tradition would flatly denounce as sinful. The premises of conventional economics may have originally been devised as models of how sinful People actually act, but they have now been twisted into guides for how ordinary People should act. I propose here to examine the possibility of replacing the premises of conventional economics with those of Christianity.*

The economic and ethical principles, recorded in the New Testament: ***turn the other cheek... heap coals of fire... even Solomon in all his glory was not arrayed as one of these... have all things in common...*** obviously represent a material self-interest that is widely diffused and communal rather than individualistic, whereas principles of conventional economics are solely those of selfishness, a crude red-in-tooth-and-claw formulation of interactions between People that downplays the possibility of any kind of communal interest, or any model of self-worth other than the accumulation of stuff. What other science not only doesn't model equilibrium, but actually premises its calculations on the impossibility of equilibrium, and denies the limiting states of the system it is studying?

The reading of economics texts is well known to produce acute stomach pain among practitioners of the other sciences - and even among thoughtful economists: “...*self-absorption and consistent policy error are just two of the endemic problems of the leading American economists, and not even the most serious among them. The deeper problem is the nearly complete collapse of the prevailing economic theory -- of the structure of thought that supports their policy ideas. It is a collapse so complete, so pervasive, that the profession can only deny it by refusing to discuss theoretical questions in the first place.*” (James K. Galbraith, ***How the Economists Got It Wrong***,<sup>6</sup>)

The struggle between entrenched selfishness and a covenanted expanded kinship among the People of God goes all the way back to the Exodus. In the oldest substantially intact Scriptures God speaks through Amos almost entirely against economic corruption and income disparity. Just as much as the Judeo-Christian God is a God of history, He is also a God of economic justice, equality, and compassion. It's no accident that People consider themselves to be happy in communities in which personal wealth is relatively equitably distributed, whatever the absolute

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<sup>6</sup>The American Prospect, 11(7): 14 Feb 2000 <http://www.prospect.org/archives/V11-7/galbraith-j.html>. Among economists the “post-autistic economics review” <http://www.paecon.net> now provides a forum for alternative views of economic theory. (Sept 2005)

level of wealth may be.

About the middle of the past century, it was hoped by many that some of these precepts had influenced some of the policies of the liberal democracies, but in recent decades an ascendant self-centred creed of hoping-for-fiscal-gain (*hffg*) has been widely established as a state religion. Along with the growth of for-profit transnational corporations, conventional economic theories and language have been embodied in the mechanisms of government, thereby insisting that every citizen participate in the liturgies and rituals of *hffg*. Economic growth is given more reverence than religion, since everybody is supposed to worship the same model. Such a creed clearly denies the New Testament principles, and in such an environment those who would order their lives along Christian (or even sensible) lines must develop, affirm, and live by economic principles that will clearly distinguish their behaviour from that modelled for individuals for whom selfishness is the primary motive. It doesn't much matter whether the 'Christian lines' are conventional supernatural religious Christianity, agnostic Christian activism, Popperian open-society hypothetico-deductive democracy, or a new-age Gaia-worship: the challenge is the same.

Since about the mid-1950's (Daniel Janzen's 'Bulldozeric Era') it has been apparent to these reasonable People that excessive human population (coupled with lifestyles of debauched consumerism and the exploitive search for wealth) is the great peril of the Earth. As parents, therefore, such reasonable People have conceived the small number of children it was appropriate to bring into an over-crowded habitat only in the hope that their children, growing up in a home where the welfare of the Earth had first or high priority, could work disproportionately effectively to harmonize humanity's tenure on this planet. This has been especially true in commercial lands where traditions of over-consumption require reasonable People to live conspicuously more frugally than their neighbours, and where each child nonetheless imposes a heavy load on the species and ecosystems exploited by the ambient economy.

Despite this, the children of reasonable People live among multitudes who evidently had their origin in thoughtless or anachronistic couplings. Like warriors sprung from dragon's teeth sown by some business-hero of old, these commercial masses seem determined to wring the last orgiastic shreds of evil from the exploitationist way of life. Revelling in willful ignorance of their surroundings, they have somehow convinced governments to forget the hard-won insights of the first half of the 20th century, and to establish exploitationist consumerist greed as the normative creed in most of the nations of the Earth. Governments, accordingly, insist that all their citizens be economically motivated by nothing higher than the obsessive, all-consuming, never-ending, and insatiable *hffg*.

The quasi-Hellenistic Communist system having fallen to the quasi-Roman capitalists, we're just as captive to *hffg* as early Christians were to Rome, and in both cases short-term stability papers over fundamental social and ecological flaws. We're inundated with the expectations that we will worship commercial idols, and there is little clear guidance on how to avoid such obeisance. In what remains of public discourse, the 'citizen' of previous generations has been downgraded to a passive 'consumer,' and any association of citizens banded together for any good end is stigmatized as a selfishly motivated 'special interest group,' no matter how altruistic their goals may be.

***The economic and ethical message of the gospels is the aggressive subordination of selfishness to cooperation, on the expectation that, over the long term, shame will ensure reciprocity.*** The founding metaphor for this behaviour is the free gift of grace, the individual's freedom from guilt that is given — with almost potlatch insistence — by God, and called 'salvation.' If God is said to deal out salvation as a free gift, then it behoves His sons and daughters to deal similarly with their neighbours. I can't see that this would produce anything other than a potlatch-like economic system,<sup>7</sup> in which, as much as possible, gifts take precedence over purchases. There's a compelling parallel with the evolutionary story of descent-with-modification-by-natural-selection, where evolutionary survival is due to a freely given squeaking-through-by-chance rather than any sort of Lamarckian justification-by-works: a by-product of ecological function, with no cost of its own.

It's not far to seek, if economic transactions are to be described by a science-like discipline, for the analog of salvation: it is ***the free gift of life given to People, as a community, by the biophysical community of the Earth — the other species that are our relatives and neighbours, and the physical environment they have created and inhabit.*** The basic problem for a formalized economics is, therefore, to calculate the cost imposed on the world community by the presence and activities of People. One reason for this is to know and appreciate the gift we have been given, and the other is to learn how to minimize the burden we impose on other species and communities. Students of economic literature will recognize this great gift as the 'externalities' and 'common resources' that conventional economics scrupulously excludes (with what appears to be pathological ingratitude), from its equations.

The elemental particle of conventional economics is, of course, the selfish individual or corporation. With calculations based only on selfishness, the institutions of a commercial society, actively and passively, strive to mould People towards more selfish behaviour, both to confirm their selfish motivational models, and because they have the mathematical tools at hand for calculating the results. And what is the elemental particle of a projected Christian economics? The smallest unit where individuals currently exist without self-interest or distinguished personal property is the family or household. Conventional economics operates outside this 'nuclear' family (in which individuals, like nucleons within an atom, lose their economic identity), and the divorce and taxation industries are constantly trying to break it up into selfish fragments by bombardment with accelerated advertisements, regulations, and services.

Selfishness, however, is essentially boring, because one (and especially one's banker) comes to expect a certain economic return from a particular activity, and to become sullen and resentful<sup>8</sup> if this fails or is thwarted or denied. In an essentially chaotic world, irregularity is the norm rather than the exception, and expecting regularity is an ultimate well-spring of anxiety. A free gift,

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<sup>7</sup>Economic exchange among the settled peoples of the northwest coast of North America, the richest hunter-gatherer societies in the modern world, was dominated by extravagant feasts of giving-away known by the Chinook name of 'potlatch.' Astonished starched-collar Christian missionaries tried to stamp out the potlatch as "wasteful," but any story as simple as Christianity is easily misunderstood, and the starchers were so embedded in a capitalistic matrix that had not yet become obviously world-destroying, that they didn't perceive the conflict between their professed religion and the antithetical economic system that was culturally tied to it in their minds.

<sup>8</sup>Sullenness and resentment are the active forms of boredom, as wonder and amazement are of joy.

however, is always a joyful surprise. Since one has no way of knowing what the gift will be or whence it will come, it is never boring. Furthermore, since gifts spring from perceived surplus, and are directed at those whose need is greatest, they buffer chaos with joy rather than by force.

So the values of conventional economics are completely inverted: where science, religion, and philosophy teach us to humbly account for the greatest gift we could be given, so that we need accept only what we require to get by, economics turns a blind eye, sullenly takes for granted an incalculable subsidy, or grabs for as much as it can get. And on the personal level, where science, religion, and philosophy affirm that community is enhanced by the free exchange of subsistence between individuals, households, and communities, economics desperately strives to turn us into one-dimensional, scheming, calculating, engines of greed. Maybe Satan is the great evangelist, because, by taking the “business model” to an idolatrous extreme, he converts people to a sensible view of the world.

So how would these ideas be implemented? One point is to take New Testament economic advice seriously. No Christian would think of scorning the New Testament prescriptions of interpersonal civility or spiritual salvation to the extent that the economic models set up by Christ and the early Church are ignored. In an era in which *hffg* is clearly the great Satan, the economy of most nominally Christian households appears to be indistinguishable from that of pagan consumerists. Some Christians may covertly assume that ***“Sell all you have and give to the poor”*** was an appropriate policy when a miraculous ‘second coming’ was expected at any time, and that more worldly-prudent economics is appropriate if no such event has been perceived after two millennia, but to do so is to defy the integrity of Christian teaching, and of the Scriptures.<sup>9</sup>

Given our tremendous wealth-generating technical ability, and the way this and our ever-increasing numbers press the limits of survival, the present is not an era when any action or possession is private: a claim to private privilege or possession is a knife held to the throat of the Earth and its children. Conventional economics may have begun innocently, but it has been appropriated by those whose behaviour it attempted to describe, so that ‘growth’ and income disparity have become actively pursued goals of economic policy, rather than unfortunate by-products of an observed system. While the present unsustainable human occupancy of the Earth requires that the whole size of the enterprise must be, and can be, reduced substantially without inconveniencing anyone (especially if this is accompanied by a substantial reduction in income disparity), it’s also important to respond to the ethical challenge the pervasive implementation of conventional economic models make to an individual. *“What,”* in Deacon Musherat’s lament *“can a patriotic man do?”* We don’t want to heed Molester Mole’s call to *“...support to the death — to the death, mind you — those principles which, through proper polling prove they are*

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<sup>9</sup>If the ‘second coming’ is immanent, then the first century strictures still apply with increased force. If the eschatological prophesies referred to something that occurred at the time of the destruction of Jerusalem, we’re living in the Kingdom, and should not abandon its principles for those of the fallen World. If these prophesies referred to something as different from a literal reading of the Revelation to John as Jesus was from a restored Jewish monarchy, then chances are it has already happened, and we’d better be careful we understand what’s going on before abandoning any teaching. Understanding implies scholarship, which already incorporates many of the free-gift features of the potlatch, and scholars are typically fiscally impoverished....

generally, if not unanimously, acceptable,”<sup>10</sup> but to work out the implications of a free-grace economics that can be lived in the contemporary world as a witness both against short-sighted selfishness and in support of truth and love. The following suggestions are modelled on things our household has tried to do over the years, and the details may not have universal applicability, especially if they come to be widely practised — any morality must start as a minority movement, but the behaviours it then prescribes may become partially inappropriate in an environment in which they have become more widespread.

1) **Calibrate yourself against the whole world**, and ask, as the Worldwatch Institute has, what is the maximum *per capita* income compatible with sustainable life on Earth: the answer is basically that the conventional North American poverty line must be regarded as a ceiling rather than a floor for personal income.

2) **Form communities that maximize the extent and duration of free exchange.** Such communities need not be the isolated experimental ‘communes’ of derogatory 19th and 20th century reputation, but can be networks of households who interact among themselves as much as possible by free exchange, while continuing to deal with others in a more conventional ‘market’ way: *‘In the world, but not of the world.’* It’s also important to keep households pure by dissolving any internal fiscal structures, by not having separate bank accounts for spouses, not paying children for doing chores, and governing the household by a democracy of mutual respect.

The divorce industry tries to break up these last communities of economic free exchange into smaller fragments so they can sell the fragments more, less intensely-used, stuff, and destroy more land for less-densely-inhabited ‘housing.’ ***In the face of the divorce industry, marrying carefully may be the most important thing you can do for the Earth.*** Every stable nuclear couple should try to take in single adults or youths to increase the size and efficiency of the free-exchange household, as well as providing stable homes for those who are not married: experience shows that two adults is too few for an effective household.

3) **Maximize within-household productivity:** forage for salads on the lawn rather than in the produce section; do all you can to produce for yourself, and distribute surpluses as gifts.

4) **Maximize between-household gift giving**, and where accounting is necessary, barter when possible. As much as possible, shun the cash economy. Maximize your investment in knowledge, craftsmanship, wholeistic science, artistry, scholarship, and wisdom in all decisions and products, rather than force, simplification, and physical ‘resources.’

5) **Shun meat offered to idols.** When *hffg* dominates the World, chances are that anything sold by an intermediary has been more-or-less offered to an idol and may therefore be tainted. Deal fiscally, as much as possible, with individuals you know personally. If the whole world is alive with the glory of God, then every transaction is a sacrament, and it must be undertaken to wholistically maximize good — community, fairness, equality, beauty, conservation,

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10 Walt Kelly, 1962, *Jack Acid Society Black Book* pp 52-53.

biodiversity — rather than just minimizing fiscal cost or maximizing fiscal gain.

6) **Favour systems that minimize waste.** Long-distance movement of goods or energy, methods of production that degrade the Earth, and events whose only motivation is a fiscal epiphenomenon (and tax structures that mould them), are likely dangerous. Eat local vegetables. If solar energy is to become widespread, favour photovoltaic roofing and home-charging of electric vehicles over centralized sun farms from which electricity must be purchased. Consider that no commercially manufactured object is actually your own until you have once repaired it.

7) **Take advantage of the fact that sexual reproduction allows each individual to leave a descendent while the population decreases by half in each generation:** one surviving child per couple, and each taught that the service of the Earth is the natural calling of a sapient species on an overcrowded planet. The resulting scarcity of children means that they should shuttle between households of friends and relatives, so they can apprentice with the lives of other families, and so that they can establish sibling-like relationships with cousins and non-relatives.

8) **Live, as much as possible, by a seasonal rather than a calculated calendar.** The surprises of the progress of the seasons are analogous to the free gift of grace, so fixed dates and times should be subordinated to seasonally determined experiences, harvests, and festivities.

9) **Abandon physiologically implausible temporal demands.** Since you are living an eternal life, however short this may be,<sup>11</sup> you can think about time realistically, and you don't need to succumb to the staccato demands of the *hffg* economy. With three adults, for example, part-time or intermittent work-for-pay will likely suffice to support a household.

The income tax form has become the place where the idolatrous *hffg* forces itself most trenchantly into the lives of those who would live for sustainable planetary harmony. In this mandated testimony of one's every transaction there is little room for any motivation other than sybaritic selfish indulgence and ruthlessly aggressive planning for gain. In 1995 it became apparent to us that it was nearly impossible to continue to fairly represent to Revenue Canada the life of an honest-living household motivated primarily by the search for planetary harmony. Since then the narrow gates that previously seemed to circumvent the barriers of capitalist language have been further closed or constricted. We are not 'professionals,' we are in no sense a 'business,' we draw no distinction between a personal and a public life: we are scholars, artists, and naturalists, doing work that, as we see it, needs to be done, and in which we can work with others who also see this necessity. We are, as much as possible, uninfluenced by the possibility that we will fiscally benefit from any particular piece of work, and are supported largely by freely-given or accidental gifts from our friends.

We are very grateful to be living in this economic state of grace, but we find it impossible to fairly represent our household on an income tax form where everything is assumed to be done for selfish reasons. Early Christians refused to bow down even nominally to a deified Caesar, accepting martyrdom rather than formally acknowledging the validity of the you-stab-my-back-

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<sup>11</sup>*i.e.*, whether the premise of eternity is based on personal survival after death, participation in the geological time scale, or some subtler positioning in one's interpretation of the nature of time and self.

I'll-stab-yours of imperial Roman leadership. ***If we pretend, for tax purposes, to be motivated by greed, we perjure our witness of what People and the Earth should become, right at the place where those who hope for fiscal gain are most sycophantic.*** Such feigned idolatry is indistinguishable from real devotion in the eyes of the world, and will inevitably corrupt our motivation and pervert our behaviour.

On the other hand, early Christians minimized the disruption their protests caused to their society, and on their model it behoves reasonable modern People to find some way to live within the strictures of commercial society while witnessing to their nonparticipation in its idolatries. Just as it is imperative for the health of non-human species that we develop methods of withdrawing land from the market economy (land trusts, conservation easements, *etc*), it is vital for the health of human society that we find ways of withdrawing ourselves from the appearance of market motivation while not withdrawing from participation in society.

One place where commercial society acknowledges vestigial or rudimentary non-selfish motivation is in the board-governed not-for-profit corporation. Margaret Mead's "small group[s] of thoughtful committed citizens [that] change the world" are usually such not-for-profit corporations, and many, if not most, are the 'lengthened shadow' of one founding individual. It is further clear that the quest for planetary harmony is a battle fought on so many fronts that it is hard for an individual Person or household to know where to best deploy its efforts.

***We accordingly propose the widespread taking up of board-governed not-for-profit individual corporations as a new model for community and personal guidance among reasonable People.***

Working on the principle that it's easier to be sensible about a friend's welfare than about your own, individuals or households would 'give all they have' to a not-for-profit corporation whose mandate would be to make the best use possible of the individual's abilities in the quest for social or ecological planetary harmony while seeing that the individual or household was sustained in this quest. Income resulting from the principal's work would be paid to the board, which would then cover the expenses, pay the principal a modest stipend (capped at the Worldwatch Institute's maximum sustainable per capita income - the modern analog to the Medieval vow of poverty), and counsel the principal on opportunities and methods of achieving the best effect for their efforts. The principal would select respected mentors, relatives, and friends for membership on the board. This would give a degree of formal community assent to the principal's activities, while not constraining him from unprecedented or important work. Such corporations would be structurally the same as ordinary not-for-profits, and would be able to hire others to work with their principals, or to expand to any appropriate scope to further their goals. Some of the fiscal details, depending on the tax system the corporations work under, may include pensions for the principals, patterns of receipting for all expenses as a witness to the wholeness of life lived for others, or payments only to reimburse expenses, with no unaccounted expenses.

As this model of individual governance spread, these boards would become interlocking, as principals were reciprocally on each other's boards. We would expect that the first to set themselves up in this way (as indeed many already, *de facto*, have) would be especially independent and dedicated individuals, but that as time went on an equilibrium would be achieved between those who wished to stay 'employed' in the old economy, and those who

choose to work for wider goals. We would also expect that these corporations would be given especially overblown and pretentious names, such as "***Ocean Voice International,***" "***For the Biosphere,***" "***Pupil Transportation Institute,***" "***Canadian Biodiversity Institute,***" "***Sustainability Project - Inviting Debate,***" "***Ecospherics International,***" or "***Biological Checklist of the Kemptville Creek Drainage Basin,***" rather than just "***Joe Smith, Ltd.***"

## CHAPTER 5: Symbionts

Humanity is not just a single species: *Homo sapiens* is always accompanied by a surrounding community of mutually dependent symbionts: domestic, inquiline, feral, pathogenic, or weedy. Beside Corn, we've most directly affected the lives and evolution of the "domesticated" Mammals and Birds, but we've also molded the weeds and invasives that come along on their own.

### Section 1: Vertebrate symbionts

A city-dweller wrote:

> *I like the idea of knowing where meat comes from. I may use that idea in one of the articles I write for Peace and Environmental News. A few farmers at the Walkley/Bank Organic Farmers' Market, some Canadian Organic Growers farmers and Saslove's on 1333 Wellington Street West sell meat from free-range animals. Do you know of any others?*

\* Just our neighbours. Two families nearby raise their own Chickens, Ducks, Turkeys, Goats, and Lambs, and gift, barter, and sell whatever is in excess of their own family needs, or what they have arranged to share with a few other households. I don't know any other commercial source of local or free-range meat except Sasloves. If one buys meat there, one is sure to eat less meat - it is expensive! - understandably. I think meat SHOULD be expensive. I like the Japanese way of using meat - in small strips with vegetables. It seems more precious that way. An Inuit woman said one time that one of the main difficulties with life is that humanity's diet consists entirely of souls. That was a comment on traditional Inuit life - the life that was most healthy for them (until levels of dioxins and pcb's and heavy metals etc began to appear in dangerous levels in their 'country' meat). I always think of meat that way - as sacred - that there is no harm in eating something sacred as long as one give it due respect (doesn't eat more than one needs, and respects where it comes from - there's the rub). Most meat that most people eat has no known origin, and so are they not eating it with disrespect? What do they respect then - the meat packing plant, or the retailer? Or the idea that the animal may have suffered during its confinement, transportation, or death? Meat requires sacrifice. It sacrifices its life - if you don't have a sacrifice to make in return, you'd better be pretty thankful. One makes a sacrifice for the meat animals one raises oneself, by caring for them. A hunted animal is more of a gift. Native people are not allowed to sell the meat they hunt for - you must be a friend to receive meat or fish from a native person. We received Herring roe, and smoked Salmon and Rockfish on the Queen Charlottes.

I believe that some people are healthiest without meat, and some are not healthy unless their diets contain some meat. Sometimes it is hard to figure out which sort of person you are, especially with philosophical and cultural pressures dictating which you should be with no regards to physical makeup or nutritional requirement. S----- may have figured out why we have Rabbits - we certainly don't treat them as pets, though we appreciate their character. We don't

have many - but when there are young ones, more than needed to maintain our stock, we eat them just before they reach full size. We don't name the young ones, and we never eat their parents. I guess, being close to the natural world, we take our place in it as omnivores - Foxes and Lynxes and Coyotes and People eat Rabbits. When we raised Goats we milked the does and ate the kids.

All this being said, we do buy some meat in the grocery store - but I don't justify it. I have also bought some items in Wal-mart. We burn more fossil fuel than we would if we planned our trips more carefully..... but we are aware of all this, and we don't try to justify our sins, but look for encouragement to do better. -- Aleta

***Sustainable home life*** does not require the assistance of Goats, *Capra hircus*, Rabbits, *Oryctolagus cuniculus*, and Fowl, *Gallus domesticus*, since anything they would eat can be applied as horticultural mulch or processed through systematic composting. In general, however, it seems to us that the best use of the lawn's production is the one-day composting of the Vertebrate digestive tract, with its agreeable by-products of meat, milk, eggs, and companionship, while the greater range of uses the symbionts allow for products of the lawn and garden increases the efficiency of the household.

***Species accounts are not complete for the beta edition of this book.***

**Dog (*Canis familiaris*):**

tong-like scoops can be used to transfer feces from a lawn to a target plant.

hot beverages spilled on a Person are a relatively minor matter because the Person can shift out of the clothing near the burn site - it's Dogs (and other heavy-coated beasts) that need to be protected from hot spills, because their hair holds the hot liquid against the skin - and there's nothing you can quickly do about it.

**Cat (*Felis catus*):** Every household that lacks a hunting Cat will be devastated by indoor and outdoor Rodents, yet subsidized hunting Cats are a menace to small Mammal and Bird populations, and, because they're not subject to starvation, depress the prey available to wild predators. The trick is to constrain the single Cat in each household to hunt indoors, except in when large garden seeds (Corn, Beans, Squash) need protection from Chipmunks (*Tamias*). Birds are most vulnerable to Cats at dawn & dusk, during migration, and when there are fledglings about, and the Cat should be kept indoors in these periods. A bell on the collar does something to reduce hunting success.

It is not true that judiciously applied Cat litter is harmful to vegetation, though it is possible that commercially prepared Cat litters may contain undesirable mystery chemicals. Sawdust is free for the taking at sawmills, and does not include undesirable mystery chemicals. Otherwise, if your land is sandy, use clay litter, if clayey, corncob, but avoid at all costs that which uses undesirable mystery chemicals to turn itself into makes up into a mat of undrying glue.

**Chickens:** Hens are best obtained as superannuated year-olds from factory egg farms. These begin laying at the rate of 1 egg/day, and their whole life with you is an extension of what they would have otherwise experienced. As birds, they need light to be active, so they require an electric supplement in the winter or in dark quarters, and they need a heat lamp over their water or mash when it's cold. If they can range about freely, they'll pick up a lot of animal and vegetable food, but if they must be confined, they'll eat a fair amount of green grass as lawn clippings. We learned from a 19<sup>th</sup> century text to cook their grain/mash food, which increases digestability and greatly reduces the spill and scatter that occurs when mash is fed dry. The mash is cooked in an electric slow-cooker, with the food either turned out of the crockpot onto a shallow tray, or the crockpot can just be put out among the hens, and washed out when they've emptied it. Egg shells can be heated until they're fragile, and then crushed and mixed with the mash.

**Geese:**

**Ducks:**

**Goats:**

**Pigs:** we don't have much experience with living Pigs here, since the ones that Gloria Rathwell kept in the current Organelle's Barn, and then in the now-kicked down Pipers House Barn. These would occasionally, and in one case heroically, escape, and have to be chased about until they re-entered a barn. In the great Pig chase, Hubert van Stocken and Gloria & her kids and we chased the last pig all around until it wedged itself, like a Cisco in gillnet, into the Mile's page-wire fence, and was hauled back to the barn, hindfeet-first, by Hubert. When Gloria moved on, and we emptied the Pipers House Barn after we bought the place, we found dishes 5-years buried in the manure that had been left by the kids when they took food out to the Pigs (Gloria cooked furiously, but refrigerated irregularly, so in self-defence her kids would only eat really fresh food, resulting in masses of left-overs, which went into the Pigs -- though not all of the dishes made it back, or all the way back, into the house).

**Rabbits:** Rabbits are the least visually boring of domestic Mammals because they deploy their highly differentiated body parts in so many different patterns. They are the universal compact consumers and composters. They have a variety of inputs and two outputs: all of these must be tended to Rabbit-keeping collapses in chaos or Death. The primary food is woody or herbaceous plants. Each species of plant (except those that are toxic: Canada Plum, and Keevils Potato Vine, by sad experiment, and Milkweed and Andean Potato foliage by *a priori*) is to be "shoved through the Rabbits" when its time comes (see "Tangle"). They're a big incentive to weeding, since they need to be fed, and can also prosper on the twigs or foliage of Cathartic Buckthorn (they don't favour either phase of Frangulous Buckthorn), grass scythed from the lawn, kitchen wastes (including Coffee grounds, reminding us that these are, in fact, ground seeds, not some specially hyperactive waste that has to be treated as soil because it's already humus-coloured).

In the winter they subsist mostly on Cedar and Cathartic Buckthorn: the Cedar brush-axed or pruning-sawn from silviculturally appropriate trees, while Buckthorn is brush-axed or clipped where its removal will do the most for native vegetation. Branchlets are clipped from the larger stems beside the Rabbit pad, with clipped or gnawed residual stems allocated to the brush pile or kindling depending on their size and shape. Unfouled hay picked through by Goats can be stuffed into a feed sack, and distributed among cages of Rabbits. Otherwise, the winter diet consists of Coffee grounds and other kitchen waste. Late in the winter these species should be supplemented with prunings from Apple trees. Rabbits are crazy about Apple bark and foliage, but they're less excited by the fruit (in fact, in general they don't appreciate the nominal nutritional density of fruit, and much prefer foliage). Besides the above, species that they don't favour include Lilac, Ragweed, Honeysuckle, Maple (including Manitoba M.), *Populus*, Japanese Knotweed, Rhubarb, and Burdock.

With inadequate wild food, commercial pellets must be presented in hoppers or in cans hung on the cage walls, with water provided as liquid or packed snow. A diet of green food provides sufficient water for Rabbits, and even a nursing mother, even in hot weather, won't bother with liquid water if she's fed green weeds or brush. If commercial pellets are soaked in water and presented in a bowl or as a frozen chunk, there will be less of the loss to spillage and flicking aside that occurs if the pellets are presented in their dry condition.

In the winter fecal pellets may fall through the floor of the cage, or may freeze and build up. As the summer progresses, the stems of herbs become less palatable, and increasingly coarse residues are left in the cage. These outputs fall naturally into four categories: woody waste goes into a brushpile or stove as described above, coarse herbaceous stems and clipped twigs go into a stem pile, the manure pack goes into a compost pile, and fine chewings and intact pellets fall through floor of the cage (if dry pellets are fed, a lot of them, and their dust, also fall through). You keep the floor of cages intermittently clear by manually grappling and distributing the manure pack and segregating it into the compost pile and the stems pile (it's important to leave a continuous floor when young ones are newly emerged from the nest box, because their hind feet can become horribly stuck in the traditional 1-inch mesh of the floors). Each category of waste eventually makes down into compost, though this takes weeks for the pellets, months for the cage-bottom pack, years for the stems, and a decade for the branches. (this entry prepared in consultation with the *Oryctolagus* Input-output Commission).

## Section 2: Invertebrates

*this section is not available for the beta edition of this book.*

## Section 3: Fermentors & Saprophytes

Many of the finer foodstuffs are produced by microbial fermentation, and to consume these foods is to celebrate their symbiotic origin, and the symbiotic character of all life. Bread and beer are both well-known products of yeasts, commercial *Agaricus* mushrooms flourish on Horse dung, milk gains its greatest dietary interest as viili, cheese might as well be tufu until it's matured,

forest mushrooms are largely the products of mycorrhizal symbiosis, the meat of all mammalian herbivores depends on microbial symbiosis in rumen or caecum, and sauerkrauts, dill-pickling, & kimchees preserve vegetables while enhancing their flavour.

### **Making Bread**

*“When I got married, I could never bake good bread. My mother had showed me how to do it, but it never worked for me. It always seemed heavy--never very light. I was so worried. Herman's aunt showed me too but I still had trouble! Then a farming train, called the Better Farming Train, came to Churchbridge. One car was just cooking and baking. They demonstrated all the steps in baking bread. It seemed easy, and she gave me the recipe too. It used potato yeast. I got real good bread after that. The lady who demonstrated said that I had been working too hard over bread.”* -- Grandma Karstad's Story.

Aleta's protocol for bread: **Take** 7 cups warm water, ½ to 1 cup honey (to taste), and 1½ tablespoons yeast. **Add** 6 cups of Kamut flour all at once. **Stir & Let Sit** for ½ to 2 hours. **Beat in:** 2 eggs, 1/3 cup oil, 4 teaspoons salt (or less, to taste), Add rye flour two or three times, stirring with a heavy wooden spoon, until you've added 10 cups of Rye flour. Let dough rest for ½ to 2 hours between additions of flour, to let moisture soak into the flour. This is important for moist bread. When dough gets too stiff to stir, **knead** a cup or two more flour in by adding flour to the table **not** to the top of the dough.

**Rest** dough on the table, covered with a towel or plastic, for an hour or two, to rise. Rye flour makes a sticky dough, so keep the table well floured during kneading, but don't over-add flour for firm dough, or your loaves will be dry and crumbly when day-old. For crumbly bread with lots of holes in it, add flour quickly, don't knead much, and rise in a warm place until the volume has more than doubled. For moist fine-textured, chewy bread, add flour slowly, knead well, and rise in a cool place until barely double in volume. Better still, leave the dough in the fridge for a few days.

**Re-knead and divide** into the number of loaves you have pans for. Grease the pans. **Knead** each loaf briefly and roll it up tight like a sleeping bag. This helps to prevent big bubble-holes by stretching the dough to the shape of the pan. **Slash** 3 times across the tops, ¼ to ½ inch deep – this helps the centre of the loaf to expand when rising. **Rise** at room temperature or cooler, until the top of the loaf is just peeking over the rim of the pan, but no higher, as it rises some more in the oven. **Bake** at 350°F for nearly an hour, checking at 45 minutes, until the sides have browned. **Tip** out of the pans, and cool on wire racks. If you're going to pre-slice it to store, wait until it's cool, and then store it in plastic bread bags from commercial bread.

Kamut was called "King Tut's Giant Wheat" when it was grown in Minnesota between the First and Second World Wars. It was brought home from Egypt by a soldier I think I remember, and then lost in a granary for several years and revived again from a single pint of seed! It is an ancient wheat relative with the grain hardness almost of rice, but containing some gluten and producing a nice fluffy bread - though not as elastic as the modern highly-bred hard wheat. It is especially nice in muffins, pancakes, biscuits, etc. and I use it as an alternative to wheat for making my rye bread less heavy. -- AKS

### Power Pop (*“the living tonic that came down off the fridge”*)

Once a bottle of Apple juice or cider has become cloudy and developed a delightful fizz, and a trace of ethanol, you've got the symbiont you need to overthrow the giant chemical carbonization industry. Obtain one or more clean cylindrical 2-litre “recycle 1” bladder bottles, add a cup or so of the whizzed cider and some tasty and fermentable material – honey, juice, syrup, or jam – amounting to the sugar in a couple of tablespoons of honey. If the fermentables are bland, you may want to add some acid, as Lemon or Rhubarb. Top the bottle up with water, and let it sit on the shelf until it's about as taut as a bottle of commercial pop. I suppose it could explode if you made it with a lot of sugar and let it go for a few days, but so far I've successfully relied on the overdesign inspired in the commercial bottlers by the fear of litigation to which they're so susceptible. Watch out for foaming as you pour the first glass full, and make the bottle up again when it gets down to the last pint.

...for more than you want to know about symbiotic beer, consult Matt Keevil.

### **How we make cheese.** Schueler, Frederick W., and Aleta Karstad Schueler. Browse (August-September 1987):16

We keep two milking goats, and are now milking once a day, getting about a gallon and a half of milk a day, so our cheese recipes are based on using about this much milk at a time. We milk in the kitchen, filter the milk immediately through two thickness of Pronto brand paper towels, pasteurize it immediately by heating to 55 C, and then cool in running water in the sink. Milk that is not filtered and cooled as quickly as possible, or that is pasteurized at too high a temperature can taste awful. We do not have any experience with cheese-making with that kind of milk. We make two kinds of cheese, soft and hard. Both depend on the processing of milk through a culture of "viili," a Scandanavian Longmilk which is like a slimy yogurt. This will grow at room temperature, so it is more convenient than yogurt, but regular yogurt can doubtless be substituted for viili in the cheese recipes.

To maintain viili, one need only make it every two weeks, always being sure to make it in a clean jar rather than the jar the old viili was in, and to use a substantial amount of the old viili to make the new --- about 1/5 the volume of the new milk. Cold, pasteurized milk is best, but cold, unpasteurized milk can be used. Mix the viili and milk thoroughly in the jar, and set it aside for 24-60 hours, depending on how warm the room is, and whether you want a smooth viili (for eating), or a well-curdled viili (for cheese-making). It is nominally finished making when little bubbles form on the surface of the jar. As it matures further, you notice the clear tracks that rising bubbles have made against the sides of the jar, and then clear whey gathers at the top, and later the whole thing begins to separate into thicker viili and whey. Refrigerate it at the stage that you want, and it will keep for one to two weeks. Your culture will remain strong and healthy if "made" at least once a week. We can give a sample to anyone who wants to come to Bishops Mills to get it. We have had our culture for 8 years. If it begins to get strange, or is left too long between making, just make it every day for a week and it will recover.

To make soft cheese we make the viili in gallon jars, and let it mature until the cream is separated from the curd by 3-10 cm of whey. We keep the viili in the refrigerator, and remove the hardened sour cream from the surface to save for making butter. We then put the jar in a pot of hot water (with the water level up to the level of the viili) until the temperature reaches ca 60 C, or until the curd has separated to about half the volume of whey. This should take the better part of an hour. Then we strain the curd through a cloth, and let it hang for 8-24 hours, mix and salt to taste. The curds formed in this way are very delicate, and there are times when it seems impossible to get the whey to drain out. The remedies for this are to let the viili mature more, to heat it more, and to pour off the clear whey that forms between the floating and sunken curd before straining the rest through the cloth. It may also help if the viili is heated in the jar in which it is made, without mixing or stirring.

Only this spring have we found a hard cheese recipe that was simple enough for us to use. Filter about 1.5 gallons of milk directly into a large enamelled or stainless steel container, and bring it up to 60 C to pasteurize it. Dissolve 3 Junket Rennet tablets in a cup of cold water, and set about 1.5 litres of water to boil. Add from one to two litres of cold viili (or regular yogurt) to the warm milk, and stir well. Then add cold milk until the temperature is 36-38 C (this assumes you have a fridge full of cold milk and viili). You can just let the pasteurized milk cool off on its own, and you need not add the viili, but the cheese will be flavourless if it is just made with milk. When the milk has cooled to the temperature of a calf's stomach (see above), add the rennet solution, and stir gently until the curds form. This will take 2-4 minutes. When the curds are well formed, add the boiling water, and stir until it is mixed into the curds. The hot water makes the curds shrink and separate from the whey. Then let the curds & whey set for 10-15 minutes, pour off the whey, and drain the curd, a big white mass in the bottom of the container, in a cloth in a collander. Slice the curd up in 2-4 cm chunks so the whey trapped inside of it can drain out. Then put more salt on it than you can believe it could absorb, (two tablespoons at least) wrap it in the cloth, and press it under a weight of some sort. In a day it will be ready to unwrap, and then you can either set it aside to age or eat it right away as a bland (but not as bland as if you had just used milk) cheese curd.

If you have beasts that will drink whey, you can feed it to them. You can drink it yourself, except that the reason you are making cheese is that you have more milk around than you can choke down. If you keep a gallon of whey in the fridge you can use it as the liquid for soups, breads, and *cetera*. The whey from the straight viili is very slimy and acidic (it will activate baking soda) but is too heavy to use without other liquid in baking. That from the hard cheese is lighter and sweeter.

One metric gallon = 4 litres. The only measurement that is at all precise in all of this is the temperature of pasteurization and the temperature at which the rennet is added. We don't measure anything else.

### ***Fermented Vegetables***

Anybody can reinvent kim-chee – it's just ensilage or sauerkraut or dilled pickles made with a

variety of vegetables. The vegetables are chopped up in a salty brine, air is excluded, and sugars are fermented into lactic acid which preserves them for future consumption. The trick is to eat, freeze, or can the ferment before slime organisms get in and reduce your valuable product to the texture and odor of dead socks.

## Section 4: Garden plants

Many species comprise both cultivars and wild or feral populations, with pollinators ensuring the gene flow that thwarts a clean separation between them. If you buy seed, genes will flow only from the commercial source into the wild population, but if you save seed, you must be careful to select for the properties that you want in your cultivar. The wild pollen may carry adaptations to local conditions and pests, but it will also average out the gains towards vegetablehood made by artificial selection.

***Species accounts are not available for the beta edition of this book.***

tomatoes

squash

corn

beans

potatoes

onions

## Section 5: Weeds

**Weeds of Canada and the Northern United States.** France Royer & Richard Dickenson. 1999. Lone Pine Publishing and the University of Alberta Press. xxxvii+434pp, 750 photographs. (published in *Wildflower* – need to find citation)

I'm going to be pretty hard on this book, but I don't want to give the idea that it isn't useful. I instantly recognized the first species it treats as the 'sprawling red-stemmed weed with deep-green *Amaranthus*-like leaves' I'd seen in Saskatchewan last summer: *Amaranthus graecizans*, the Prostrate Pigweed...

But I suspect that, like myself, most readers will have an adversarial relationship with no more than a dozen to a score of the species treated, and will regard all the others as weedy

‘wildflowers,’ of aesthetic, culinary, medicinal, or scientific, rather than commercial, interest. Even when a weed is throttling one’s crops one would like to hear of its virtues, but the strongest language this volume uses in favour of any of its subjects is that “while beautiful [they] are POISONOUS to livestock”... So it’s a book to enrage everyone: look up your favourite plants and you’ll find them calmly damned and blasted for their agronomic sins. To start with, English names are lower-cased, which I always take as a sign of lack of respect for species....

Is it appropriate for any biotic inventory to take such an exclusively negative view of its subjects? I think not. Naturalists are obliged to stand as advocates for the species they describe, and “farmers everywhere,” to whom this volume is dedicated, deserve and require a more balanced treatment if they are to be able to fairly decide among methods of dealing with the weeds in their fields. The cover design quotes Emerson’s “a plant whose Virtues have not yet been discovered,” but many of the virtues of the weedy plants of North America have already been discovered, and to inventory the plants and the problems they may cause while ignoring their virtues does the reader a striking disservice. -fws

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There are more than fifty species in the list of herbs and semi-woody vines in or around the lawns that we regard as growing symbiotically as food for us or our mammalian associates. ***The failure of many weedy species which we have tried to introduce to our land suggests that each homesite will grow a distinctive mix of species, which may, even nearby, be substantially different from those that thrive for us.*** Mow around clumps of the useful species, select for favourable variants, and ruthlessly suppress reproduction of useless weeds. It’s important to be aware of the whole range of edible species: make sure your “useless” species aren’t among them, and learn to use those that do well around your home. The best guides to edible species are Euell Gibbons’ ***Stalking the Wild Asparagus & Stalking the Healthful Herbs***, Erika Gaertner’s ***Reap without Sowing***, and Lee Allen Peterson’s ***Field Guide to Edible Wild Plants***. Each takes a different point of view, and none is complete: the more sources you consult and the more species you try, the better the chance you will have of making full use of the species that grow on your land. It won’t take long before you reach an equilibrium in which it’s not news to you that a particular species can be eaten, or where you can amend the often overly glib text of a guide, following the lead of John Wood of *Cakile* on Haida Qwaii in August, 1989: “The flowerbuds, green pods, tender stems, and leaves can be boiled for 5-10 minutes’ – but taste awful, oh yuck, gross!”

Species maintained for their ornamental flowers are not listed. Woody species that provide human food include *Acer saccharum* and *A. rubrum* (Maples; sugar), *Acer negundo* (Manitoba Maple, sugar, knothole Oyster Mushrooms, *Hypsizygus ulmarius*), *Ribes* (Red & Black Current; fruit), *Prunus nigra* (Canada Plum, fruit), and *Pyrus malus* (Apple, fruit), *Picea* (Spruce, candles as salad).

*Taraxacum officinale* (Common Dandelion) is the most-used herb in the actual lawn. Other co-dominant species of the lawn with edible salad foliage are *Plantago lanceolata* (Narrow-leaved

Plantain), *P. major* (mushroom-flavoured Broad-leaved Plantain), *Trifolium pratense* (Red Clover), *Glechoma hederacea* (Gill-over-the-Ground, used in trace amounts), *Dactylis glomerata* (Orchard Grass), *Daucus carota* (Carrot), and *Oenothera biennis* (Yellow Evening Primrose). We've tried to eat the invasive ground cover *Aegopodium podagaria* (Goutweed, or strikingly appropriately, 'Bishop's Weed') into remission since we've learned that it is a palatable potherb.

*Asparagus officinalis* (sprouts), *Helianthus tuberosus* (Jerusalem Artichoke; tubers), *Hemerocallis fulva* (Day Lily; tubers, sprouts, flower stalks, & buds), *Allium schoenoprasum* (Chives; leaves & flowers), *Rheum rhabonticum* (Rhubarb; petioles), *Mentha spicata* (Spearmint) and *Vitis riparia* (Grape, leaves, fruit) grow in mulch- or fertilizer- subsidized patches in and around the lawn. *Viola odorata* (European Violet), *Viola pubescens* (Yellow Violet), *Lunaria annua* (Honesty), *Erythronium americanum* (Dog-tooth Violet) and a few plants of *Allium tricoccum* (Wild Leek) are other salad species that have patches at the edge of woods. We mow around individual plants and patches of *Neptha cataria* (Catnip; salad, tea), *Urtica dioica* (Stinging Nettle; potherb), *Armoracia rusticana* (Horseradish; roots), *Rumex crispus* (Curled Dock; salad, potherb), *Sedum purpureum* (Orphine; tubers), and *Chrysanthemum leucanthemum* (Ox-eye Daisy; salad), *Arctium minus* (Common Burdock; bitter salad, steamed flower-stalk cores, & the finest of root vegetables), and *Achillea millefolium* (Yarrow; salad).

*Asclepias syriaca* (Common Milkweed, sprouts, buds, immature fruit), thrives in fields beyond the area regularly mowed, as do *Fragaria virginiana* (Strawberry, flowers, leaves, fruit), *Tragopogon pratensis* (Yellow Goat's-beard, autumnal roots, spring salad, potherb), *Medicago sativa* (Alfalfa, leaves), and other dry field species that we harvest less frequently. Thickets of annual *Chenopodium album* (Lambsquarters), *Polygonum cf persicaria* (Garden Knotweed) and fewer *Amaranthus retroflexus* (Redroot Pigweed), *Lactuca* (Lettuce), and *Sonchus* (Sow Thistle) are potherbs of disturbed ground in the lawn as well as the garden, and *Oxalis stricta* (Yellow Wood-sorrel) is a nibble. *Malva neglecta* (Cheeses) and *Stellaria* (Chickweed) are over-wintering potherbs, and *Pastinaca sativa* (Parsnip, roots) *Cichorium intybus* (Chicory, salad), *Carum carvi* (Caraway, seeds), and *Anethum graveolens* (Dill, salad, seeds) often grow up near places they were sown in past years.

*Rubus occidentalis* (Black Raspberry; salad, potherb, fruit, tea) is the *Rubus* that thrives here, while *R. idaea* (Red Raspberry) sets some fruit, and a transplanted *R. canadensis* (Canada Blackberry) perished in a drought year after struggling for 6 years. We feed *Polygonum cuspidatum* (Japanese Knotweed), *Melilotus alba* (White Sweet-clover), and *Symphytum officinale* (Comfrey) to the Goats, but do not eat them ourselves. *Equisetum arvense* (Field Horsetail; fertile stems; potherb), *Barbarea vulgaris* (Winter Cress, potherb) and *Rumex acetosella* (Sheep Sorrel, salad) were common when we moved here 20 years ago, but are infrequent now, doubtless because of increased nutrient levels in the soil. Transplanted *Portulaca oleracea* (Purslane, potherb) has failed, and encouragement has allowed *Atriplex hastata* (Orach, potherb) to spread from a few plants around the Store. We don't have much *Galinsoga quadriradiata* (Hairy Galinsoga), though we didn't know it was used as a potherb when a neighbour on lower ground was driven to distraction by its prevalence among her

Potatoes (*Solanum tuberosum*). There are other species we don't eat, though we know they are regarded as edible; we add species to the harvest list gradually.

#### WEEDY SPECIES ACCOUNTS:

*Taraxacum officinale* (Common Dandelion) is a universal edible, though many clones subside to inconspicuousness in midsummer. Not cutting the lawn early in the spring encourages Dandelion clones with easily-harvested upright leaves to grow in the lawn as well as in the edges of the woods, and plants preserved in cultivated garden beds by weeding around them can grow to impressive size and productivity. And, yes, Virginia, the flowerheads are also edible. One way of using the flowerheads is by mixing a quantity of them with with a somewhat smaller volume of pancake batter, frying in fat as deep as you are prepared to employ, and serving the resulting fritters with syrup. The myth that Dandelions become intolerably bitter once the flowers open is a profoundly false urban legend spread by the minions of conventional lawn care in an attempt to promote the sale of tediocultural products. ***Dandelions remain a palatable and essential ingredient in salads and sandwiches throughout the summer.*** The traditional summer breakfast, Dandelions in mush, is prepared by microwaving coarse cornmeal & water, Tomato & *Caspicum* salsa or sauce, a splash of oil, and 1-mm scissor-shredded *Taraxacum* leaves — the bitterness of the European weed complementing the American richness of the other ingredients. We haven't ever tried roasting the roots to make the coffee substitute beloved of Susanna Moodie ('Roughing it in the Bush,' 1852, which is a sort of 19<sup>th</sup> century precursor of the present volume).

*Arctium minus* – is the most frequent of the four European Burdock species in North America, though, *Arctium lappa*, the Great Burdock, is increasingly common in Ontario. This is the coarsest of weeds, with spreading low leaves, spherical purple flowerheads, and masses of armed fruits. It's the central ingredient in the Essiac cancer cure, it's said that tossed fruit can bring down Bats, and the entire plant is suffused with a wonderful bitterness that's a delicious flavour when it's dilute in relatively tender tissues. If the Compositae are the highest plants (or at least the highest Dicots), *Arctium* is at some kind of pinnacle, with burrs that are to it what brains are to us: a Manitoba Maple among herbs. If the 9th Symphony was to grow as a plant, chances are it would be an *Arctium*...

16 July 1986. Kittson County Recreation Area, on the South Fork of Two River at Hallock, Kittson County, Minnesota, USA: Other plants along the tracks include *Arctium tomentosum*, a wide spreading Burdock with fireworks-burst blossoms. Purple-black tube-florets go up from a bed of magenta petals, to end in snake-tongue pink stigmas, crumbled whitely with pollen from clasping anthers. Before the flowers burst out of the tops of the flowerhead, the tips of the crochet-hook involucre bracts are cobwebbed together by fine hairs, which give the plant as a whole a misted look.

We've got a huge growth of Burdock around Bishops Mills, and the place is delicately redennominated the "***Arctium Utilization Centre***," with myself as chief utiler, in the hopes that each year (with the Rabbits' help) we'll be able to chew our way through the thickets before they're covered with burrs. So far we've never managed to triumph completely. If one eats the flowerstalks one is unlikely to be beleaguered by adherent fruit! We've never managed to plant the domesticated *A. lappa*, called Gobo, but it's easy to imagine that in rich soils its rapid growth

and spreading leaves would ensure that it would require minimal care.

But, like so many plants that are only briefly in season, Burdock has to be caught at just the right time - you can't be interrupted by calendral duties, you've got to be attuned to noticing the plants and have the time needed to harvest them. And if you miss - you can't console yourself with the thought that it's putting away reserves that you'll harvest next year - once *Arctium* gets away it explode all its resources into 2-metre high trelleses of killer velcro: on which even gortex will be stuck up, and anything woolen or canine will become an unbearable burr-felt. If you hope to grow substantial roots, you've got to allow the first year plants to grow in the open, rather than under trees or in the daunting early summer shade of their conspecifics.

The best time to get them is in the fall, when the roots are full of reserves, tender, and the most flavourfull of our root vegetables. But the leaves stay green late into the fall, and if you're not sharp, the ground will be frozen or snow-covered before you've noticed. If you've got deep loose soil, plant or encourage *Arctium* there, because in shallow soil you may lose a substantial portion of the root into cracks in the bedrock. An internet seed source advises: *"If digging is not your thing, take an old bale of wet hay and knock together four 1 x 4s like an empty-bottomed flat to fit right on top of the hay bale. Then fill this with garden soil and plant your burdock seeds in there. They will germinate and send their roots down into the hay. To harvest, remove the boards and pull apart the hay to reveal perfectly formed and tender burdock roots."*

If you've missed the fall roots, the a trace of the first shoots of spring can be a bitter principle in salad, but, the challenge is to get the stalks and petioles as they begin to erupt:

**19 June 2005:** cut my first *Arctium* stalk for processing - must have been 4cm across the base, and provided a whole tent-city of leaves to be imposed on the Rabbits. The inner flowerstalk, under a woody barrier of bitter fibres, was as advertised: like a cross between cheese and Celery, white smooth, and without only a hint of the bitter principle, though that may have been from my hands and the surrounding fibre. I cut it into 20-25cm lengths, and then used a knife to cut the surrounding cortex off as completely as possible (with the high fibre content a vegetable peeler was useless).

**7 July 2005:** the hugeness of these plants (like other annuals or biennials that grow uncrowded in rich mesic sites) is astounding. Cut 2 2-m stalks (spreading branches with buds just getting prickly) from the thicket under Kathy's porch and sliced 5-10mm segments of the petioles into boiling water. They were very tasty, with the bitterness all cooked out, but they are too fibrous for conventional consumption, producing wads of hard-to-swallow green fibre. I then went to 2-4mm slices, and these were chewable. Very tender except for the fibres, and with a bit of butter and Soya sause, they made a nice, if filling plateful. These would be very nice in a stirfry: even as 5-10mm slices, if mixed with rice, so that the fibres wouldn't wad up.

One has little hope that wives and other cultivated-food and bought-food cultists will call for this very often, though the internal wads of fibre certainly displace other more fattening food. No-one who lived on what we might call a megabiotic diet of Burdock petioles and Rice simmered in

Tomato juice would ever become grossly obese, even if the panfulls were seasoned with a trace of cheddar or Chicken...

*Asclepias syriaca* (Common Milkweed) is famous as the native “noxious weed” that's the sole larval food of the Monarch Butterfly, but its sprouts, buds, and immature fruit, so long as they're tender enough to snap off, are equally famous (among initiates) as Human food. Unfortunately, in their zeal to annoy landowners, provinces have made Milkweed the crown jewel of their lists of noxious weeds, thereby raising the interesting philosophical problem of whether, in a 'free and democratic society,' it is possible to criminalize tolerance of a native species? If such legislation were to be enforced, the native species would be driven to “At Risk” status, and if this is to be avoided enforcement must be incomplete or discriminatory. Milkweed is so widely listed as a 'noxious weed,' and these lists are copied so thoughtlessly, that in Saskatchewan *Asclepias syriaca* is both criminalized as a noxious weed, and protected as an endangered species (needless to say there's an empirical basis for the latter status).

As a vegetable, there's nothing much to compare it with. It's said that it tastes quite a bit like Asparagus, but while the textures are about the same, and the flavour, presumeably a single compound characteristic of the species, is the same kind of flavour, it's an entirely different and distinctive flavour. Texturally it's soft and fluffy, with the alkaloid bitterness diluted to a very nice mildness, especially when slathered with salt and butter. THE TRICK is that you snap off any above-ground part of the plant (shoots, stem tops & leaves, buds, young pods) that will snap, and put them into already RAPIDLY BOILING WATER - this dissolves the alkaloids, dissipating them into the cooking water. If you put the Milkweed in cold water and heat it up, the latex curdles, and traps the alkaloids in the herb. You can read in books from the States that you need to boil it in 2-3 changes of water, but either that's a form of obsessive-compulsive behaviour, or the implementation of a desire to eat tasteless food, or else our Milkweed has a lower dose of toxins than Pennsylvania plants do.

On the other hand, Sandy Garland writes that “by August even the shoots contained too much alkaloid and I nearly poisoned myself.” So it's important to stick to the snap-off tender parts, cooked in rapidly boiling water. You can also alkaloid yourself with greenish new Potatoes, by eating them for three meals in a day, though others in the family, who don't binge, don't suffer.

Bev Wigney has had Milkweed in her pastures for many years and Horses, Goats and the odd cow have grazed around it. “There are a number of other locally occurring plants which are toxic to livestock, but it seems that most animals will rarely consume them unless the pasture becomes so over-grazed as to leave little else. Dried milkweed in hay is probably not at all problematic -- at least not to Goats. We had a herd of Goats for many years and occasionally cut and baled forage for them from one of our fields which contained a good deal of Milkweed -- it was an old pasture that we have never seeded for crops.. The Goats would fight over the dried Milkweed and most other "weeds" in that particular hay. In fact, many of the dried weeds were much preferred over the more typical pasture grasses and legumes. The milk wasn't at all bothered by the dried Milkweed, but perhaps it would be if Goats were to consume fresh plants.”

*Urtica dioica* (Stinging Nettle) -- these tall perennials are protected by tiny hypodermics loaded with formic acid (and are, accordingly, available only by prescription in the USA, due to the war on drugs), Nettles are accordingly under-protected by fibre and toxins, and are as fine a potherb as any. They are collected either by the firm grasp mandated as the classic staves:

"Gently stroke the stinging Nettle  
And it welts you for your pains,  
Grasp it like a man of mettle,  
And it soft as silk remains,"

..or by a hand protected by a plastic bag or rubber gloves.

Nettles grow in rich soil, and the trick is to harvest them moderately enough to sustain their coverage in the site. You may need to pull competitors, which may include Motherwort (into the Bunnies) and Catnip (how many mice can you stuff? how calm can your digestion become?), and avoid trampling the site after you're done harvesting.

*Tragopogon* -- need to know species -- roots are excellent as "parsnips," but if you're serious you'll buy seed and grow a cultivar of "Oysterplant." The leafy flower stalks, while they'll easily snap, before the buds fully swell, are excellent as "asparagus" or as a potherb, depending on how thick the stalks seem.

*Hemerocallis fulva* – we eat Day Lilies: tubers, sprouts, flower stalks, & buds in every season, and every part. In early summer it's the flowerstalks, which are picked and cooked like Asparagus, then the flowerbuds can be cooked like green Beans, and then blooming or wilted flowers can be used (though they don't put up replacement stalks for the flowers you harvest, so you won't have flowers in the clumps where you harvest the stalks or buds). Earlier the leaves and leaf-clump bases can be steamed or used in salads (sometimes if you eat too much you'll get the runs, so don't make them your sole diet, or the bulk species in your salad), and in the fall or earliest spring the tubers can be cooked like small troublesome Potatoes. Some of the varieties are said not to produce such large tubers as the wild-growing kinds, but what they do produce would be no less edible.

*Aegopodium podagaria* (Goutweed, Bishop's Weed, Snow-on-the-Mountain or, from before we knew its identity, and before we knew it was edible, "Weirsbane") is the kind of invasive alien that provides a lot of good clean fun, without, so far, invading wild habitats around here too extensively. Its idea of a rewarding life is to crowd out other vegetation from your lawn and shrubbery, particularly in loose soil where it can send out rhizomes a foot or more per year, so you've got to retaliate by making it your early spring potherb of choice. It suffers no damage from Insect herbivores, so the human challenge is to chew it down into subdominance. In the spring it's a nice potherb, but with a rank flavour that's off-putting until you get used to it. Later in the season it gets tougher, though never very strong-flavoured, and teams of lawnmowers, Goats, or the submission of handfulls to Rabbits are required to subdue it. There's a variegated version (*A. podagraria* 'Variegatum') with pale green and white leaves which looks so loathsome

that you wouldn't want to eat it, but since it's sacrificed so much photosynthetic potential for horticultural novelty it's not as aggressive as the bright green wild-type.

*Chenopodium album* (Lambsquarters, LQ's). This wonder-herb is the foundation of gardening in Bishops Mills, as Dandelion is of foraging. One assumes 'Lambsquarters' refers to the species growth in the richly manured soil where lambs have been quartered, but I don't know if Sheep regard it as unpalatable, or if there's some other etymology. "Myles" is cited as an "old" english name of the species, and it was "called 'melde' in Saxon." Wikipedia lists Fat Hen, white goosefoot, lamb's quarters, lambsquarters, and pigweed as english names.

From: Frederick W. Schueler  
To: Oldham, Michael (MNR)  
Subject: [Possible SPAM]:Can any sense be made of our Chenopodium?

Mike, [Wikipedia](#) says: "*Chenopodium album* has a very complex taxonomy and has been divided in numerous microspecies, subspecies and varieties, but it is difficult to differentiate between them. Published names and synonyms include *C. album* var. *microphyllum*, *C. album* var. *missouriense*, *C. album* var. *stevensii*, *C. album* subsp. *striatum*, *C. acerifolium*, *C. centrорubrum*, *C. giganteum*, *C. jensejense*, *C. lanceolatum*, *C. pedunculare* and *C. probstii*. It also hybridises readily with several other *Chenopodium* species, including *C. berlandieri*, *C. ficifolium*, *C. opulifolium*, *C. strictum* and *C. suecicum*."

As a forager in Bishops Mills, I recognize three kinds: a lanky all-green kind (*C. berlandieri*?), a stringy kind with whitish leaves and ball-like flowerheads and a compact tender kind with red streaks along the stems. Any botanical interpretation you can provide without taking too long would be appreciated. -- fred.

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Subject: RE: Can any sense be made of our Chenopodium?  
Date: Mon, 13 Aug 2007 18:54:56 -0400  
From: Oldham, Michael (MNR) <michael.oldham@ontario.ca>

Hi Fred, I don't think I can shed much light on weedy Chenopodiums in southern Ontario. According to most recent authors there are three widespread *C. album*-like weedy species in southern Ontario, *C. album*, *C. strictum*, and *C. berlandieri* (as well as other, less common, introduced and native *Chenopodium* species). They are not easily separated and I don't feel confident identifying them. I think that *C. album* is the most common species and probably represents most of what you are seeing. I have seen the "ball-like flowerhead" variant and plants with red vertical lines on the stem but these are not characters used in taxonomic treatments and plants with these characters are probably within the variability of *C. album*. The statement in the [Flora of North America for \*C. album\*](#) gives some idea of the complexity of the group: "*Chenopodium album*, one of the worst weeds and most widespread synanthropic plants on the Earth, in its broad circumscription is also among the most polymorphic plant species. It is a

loosely arranged aggregate of still insufficiently understood races. Hundreds of segregate microspecies and infraspecific entities (including nomenclatural combinations) of the *C. album* aggregate have been described and/or recognized by various authors. Some authors have recognized numerous segregate intergrading species, while others have developed elaborate infraspecific hierarchies with numerous subspecies, varieties, forms, and even numerous subforms, or have combined both approaches. Neither approach has brought satisfactory and uncontroversial results. It is evident that most recent evolutionary processes within the group were greatly affected by anthropic factors, including extensive recent invasions, hybridization between previously geographically isolated taxa, poly-ploidy, intensive selective processes and mutagenesis in synanthropic habitats, gene drift, and so forth. All of these modern factors further complicated the taxonomic situation." -- Mike

Authorities assure us that the basis of our Neolithic horticulture "is mainly known as a noxious weed with global distribution, occurring from 70°N to 50°S, including all African countries; in the tropics mostly at higher altitudes." The authorities are willing to admit that "young shoots and leaves of *Chenopodium album* are occasionally used as a vegetable," that in "southern Africa it is considered a popular wild vegetable," that "in isolated hill communities inhabiting the montane zone of the middle Himalayan range *Chenopodium album* is a subsistence food crop," and that "medicinally, the seed of *Chenopodium album* has been used traditionally to improve the appetite and as an anthelmintic, laxative, aphrodisiac and tonic; they are also thought to be useful in biliousness, abdominal pains, eye diseases, throat troubles, piles and diseases of blood, heart and spleen." "The nutritional composition of *Chenopodium album* leaves per 100 g edible portion is: water 84 g, energy 184 kJ (44 kcal), protein 4.3 g, fat 0.8 g, carbohydrate 7.3 g, fibre 2.1 g, calcium 280 mg, phosphorus 81 mg, vitamin A 11,300 IU, thiamin 0.15 mg, riboflavin 0.4 mg, niacin 1.3 mg, ascorbic acid 90 mg."

LQ's arise miraculously, early in the spring, from bare or disturbed ground that's been anywhere near a seed source. They are harvested by snapping off shoots, which accumulate in the hand and are dropped into a plastic bag. This involves a lot of snapping. Some plants will be harvested just for the first round of snap-offs, but others will be allowed to grow to some size, and yield successive crops. A leaf miner (*Eurisaca?*) disfigures leaves early in the season, but the mined leaves can just be discarded. The cultural trick is to provide sufficient water and nitrogen to assure vigorous regrowth, which, with repeated harvests, will put off flowering as long as possible. The harvest is increased and flowering is also delayed by thinning out the plants so you're harvesting from spherical bushes instead of from flat-topped stands. When you've fallen behind in your harvesting, or August has asserted its dominance, pull all the plants that aren't wanted for next year's seed, and pass these through the bunnies. The complexity of the taxonomic situation assures us of plenty of genetic resources, so every household, by allowing only the best plants to survive to set seed, should establish their own selected population of optimally productive plants. The seed can be harvested as a grain, but we've never succeeded in doing this.

LQ's are the bulk of mid-season salads, much more than spinach as a potherb, and the critical green ingredient in the best Potato salads. We've tried fermenting it, as sauerkraut or kimchee,

but we haven't paid close enough attention to get to the fermenting material before it smelled like old socks.

*Pastinaca sativa* (Parsnip - the English species name has got to be "Parsnip." since to call them "Wild Parsnip" would be to treat the domesticated condition as normative, and wildness is the original condition, so the cultivated strains should be differentiated as "domestic Parsnip" if a separate name is required. "Poison Parsnip" seems an unnecessary slight on one of our most delicious vegetables). It's really surprising how few People recognize Parsnip - despite its increasing visual importance all over our landscapes as the major source of pre-goldenrod yellow for the past 20 years or so. It's also surprising how few People don't recognize it as a source of "phyto-photo-dermatitis" despite the exquisite pain and years-long persistence (at least as scars) of the resulting lesions. Yet everybody recognizes or at least knows about Poison Ivy - which is a New World novelty, while Parsnip has been with english-speaking People longer than the language. This reaction is to furanocoumarins in the sap, toxic chemicals that once absorbed by the skin and exposed to solar UV cause painful blistering.

It's likely that both the increase in feral populations of Parsnip and the modern preference for running about half-clad has increased the rate at which sensitive skin simultaneously comes in contact with Parsnip sap and sunlight. I've only been nailed by it once - on the inside of my elbow when I was harvesting it to see if Chickens would eat it (they won't). The blister lasted for a couple of months, and the scar for several years. I got a rash in the same place in a later summer at a time when I was cutting & carrying Carrots for the Rabbits, and I suspect the Carrot sap was the cause.

Learning about the "phyto-photo-dermatitis" many gardeners exclaim "Eeeek!!! How do I get rid of this thing?!" It's a wonderful nectar source for Flies and other small Insects and the host plant for gorgeous Black Swallowtail caterpillars, which hatch out into one of our handsomest butterflies. If you must get rid of it, just pull it up in the evening while wearing clothes. It's the combination of sap+sun that's the problem.

As a monocarpic biennial it grows a tuft of leaves and a taproot in it's first year, and then the 2 m tiered extravagance of green and yellow in the second. One way to diminish the threat from the broken stems of the second-year plants is to dig up and eat the wild roots after frost - they're just as edible as their domesticated cousins, though Jennie's infant name for them - "Rat-tails" - suggests their average size. If you can get seed from cultivated varieties into the ground very early in the spring, or in the fall before, they grow impressively large and delicious roots if there's an adequate supply of water and some weeding (though in 1984, when I planted them in the Upper Garden as displacement activity from the frustration of Aleta's prolonged packing for our summer in Tobermory, they grew very well without any care). For years we tried to save the seed, in order to pick up the "genetic resources" of the local wild populations, but the problems of saving and replanting the best roots, and in some years the umbel-munching propensities of Parsnip Webworms, *Depressaria pastinacella*, greatly reduces the harvest of seed ("broad yellow umbels are transformed into ugly masses of silk and frass.")

On the subject of the Webworms, it seems that Parsnips had lived in North America for roughly 250 years without this pest, and examination and analysis of herbarium specimens shows that when the Webworm was introduced to North America, in 1869, Parsnips had much lower levels of furanocoumarins than European plants, but they re-evolved European levels of furanocoumarins over the 20th century. "None of the [herbarium] specimens collected between 1889 and 1909 showed evidence of webworm activity. After that, a significant increase in webworm attacks was observed. Furanocoumarin content of seeds increased dramatically with the appearance of webworms... On reassociation with its nemesis, Parsnips evolved increased furanocoumarin content." ([Zangerl, A.R. and M.R. Berenbaum. 2005 Increase in toxicity of an invasive weed after reassociation with its coevolved herbivore. Proc. Nat. Acad. Sci 102:15529-15132](#)). This suggests that the increased notice local people are taking of the phyto-photo-dermatitis from Parsnips isn't just because they're more scantily clad than in previous decades, but because the plants are more toxic.

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### Field notes of Frederick W. Schueler

(published with some revision as Schueler, Frederick W. 2006. *Rampant Tangle: field report of a backyard habitat*. Burnt Toast, 4(2):9, summer 2006.)

visit. natural history, walk. FWS05Jul092000/a

Canada: Ontario: Grenville County: Oxford-on-Rideau: Bishops Mills General Store.  
MAP:31B/13, UTM 18TVE 446 688.4. 44.87282N 75.70097W

9 July 2005 TIME: 2000. AIR TEMP: circa 24C, cloudy, Beaufort light breeze

HABITAT: gravel/hedge/paved area around store building in rural village on limestone plain; description of backyard from a letter to Karstads.

Martha Karstad wrote:

> *Wow, what a busy life you all have there! Stop and smell the roses once in a while.*

\* the Roses are doing okay. Early this spring I hacked back the Persian Lilac that was overwhelming them (Rabbits don't favour Persian Lilac as food any more than they do Common Lilac), and they've grown up and bloomed prolifically.

Everything has grown prodigiously in the areas behind the Store, and I believe 'a riot of colour' is the technical term. As Alfred Russell Wallace first observed, in these temperate climes there's no need to cultivate plants for their flowers because our biennials and short-lived perennials have such colourful blooms. And as he didn't observe, as soon as the blooms start to fade you can shove them through the Rabbits to make room for the next season of bloom. Right now Carrot and Sweet Clover provide masses of upright white, with sprawling Alsike Clover on ground level. Slopes of tall Daisy Fleabane, a rounded massive clump of Feverfew, and fading ranks of

Ox-eye Daisies combine white and yellow. Parsnip, Birds-foot Trefoil, Lesser Hopclover, Shrubby Cinquefoil, a couple of feral *Sedum*, black-eyed Susans and a couple of feral Composites do the honours for bright yellow (with fading assistance from two species of Cinquefoil and a yellow Avens), with orange Daylilies and Butterfly Weed, while clumps of Musk Mallow, a feral *Sedum* and immensely tall Milkweeds mingled with Fireweed (2 m tall along the back hedge), hold up the violet end of the spectrum. Clumps of tall Delphiniums, Blue Bells, and low Healall do blue, Herb Robert shoots stars of red-purple through the tickets, and reds are represented by parti-coloured *Gaillardia* and little feral Poppies.

Dandelion & Dock flowers and Goatsbeard plants have already been shoved through the Rabbits, and the Ox-eye Daisies are next in line for that treatment. We're harvesting and pickling Lambsquarters and Orach, which also form our salads with Dandelions, Sow-thistle, Catnip, Spearmint, Daylily flowers, and Garlic Chives. Except for the petioles of the flowerstalk leaves, the Burdock is now too tough to eat, and I'm hoping to hack down the explosively spreading flowerstalks before they flower. Also the huge Thistles, which will be allowed to flower, but not to set fruit, before they're sent to try the Rabbits' patience. In the late summer the place goes mad with Goldenrod, and one clump is already almost 2m tall. A big crop of Black Raspberries is soon to be ripe. The vehemence and size to which many - most - of these have grown this year is astonishing: you can't walk around Jennie's little trailer without crushing something interesting. One of our small-bitter Plum trees has died, though a sucker beside it, and the other big tree, are laden with fruit. The native Canada plums that I casually ripped from the stand outside the village and shoved into the ground along Mill Street have barely survived, and in a couple of years will be struggling with the Lilac and Fireweed.

The incredible masses of Rabbit Mosquitoes that we had in late June and early July are fading away at last, and the Rabbits are looking less haggard from their attentions. It isn't only the Rabbits who devour the greens: *Homo sapiens* also have herbivore appetites. When you feel the need for one of these summer salads, you can gather a big handful of the snap-top shoots of about 4 parts Lambsquarters, 2 parts Orach, and single parts of Catnip, Spear Mint, and the soft tops of Common Sow-thistle (*Sonchus oleraceus*). That last one is the secret ingredient, another milky Composite standing in for Dandelion and packing just as much of an addictive wallop as its shorter relative (it's only because the flavour is bred out of cultivated Lettuce that it doesn't have the same effect - make salad of the bolting stalks of your Lettuce if you want to learn why the species was originally domesticated).

Bringing this handful of tops into the house, I scissor them into 2-10 mm lengths, and look around the kitchen for dressing materials. The wife is off vinegar, but she's away, so I splash in a distilled dollop. We're nearly out of Olive oil, so Canola will have to do. Hot sauce (really just dried Red Pepper soaked in vinegar) is at hand and in it goes. And for sugar: the usual choice is between Maple syrup and honey, but last night I had a really entertaining Rice salad with Orange juice at Seburns', so the last of a can of concentrated Orange juice goes into the bowl. Top it off with a spoonful of Miracle Whip to whiten the dressing, and to make it evident when the salad is fully mixed. Then the big decision: starchy or green? There will be more of it if it's starchy, so an equal volume of cooked Millet joins the fray.

Observe the procedure here: I've taken my lesson from the Goats (select the tender bits, mix different toxins, and cut the fibres up short), and from the basic Theory of Salad, as learned at my mother's knee (acid, oil, salt, Capsicum, & sugar), and I've applied them to a handful of mid-summer weeds and some Millet cooked for the Dog. I've used the plebeian alternatives for much of the dressing, but patrician equivalents could be substituted for any of them to good effect.

With such ingredients, you do have to chew it, and, as you chew, every nerve ending in your buccal cavity is stimulated into enthusiasm. The nerves report that there's no problem with the Orange juice, which gives a subtle undertone of, well, Orange to the central interaction of the Composite bitterness, the sharpness of Mint, and the mingling of the dressing. As Stan Rogers might have sung: "A salad comes from nowhere, and it goes off like a bomb."

And as Tom Graham said: "It gets in your mouth." Even those who protest all through the preparation of such a salad that it will be impossibly strong-flavoured find themselves munching down more than they meant to. But these are not the watered-down greens of commerce, and like Peter Rabbit's Lettuces, they're soporific, so don't eat too many bowls-full before you drive to North Bay or plan to operate heavy machinery for extended periods of time.

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Determined by: F.W.Schueler; Site accuracy: 100m ard homesite; Coordinates from: Global positioning system, datum UTM NAD 27 Canada & Lat-long WGS 84; EOBase entry: FWSOBS FWS/2005Jul09/2247:20; source: FWS/biography/as entered/EOBase; record last modified: FWS/2005Jul09/2247:20.

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Bishops Mills Natural History Centre

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## Section 6: What's an invasive alien?

An ***invasive alien*** is a species that's not regionally native, though it may be native elsewhere in North America. Local populations reproduce and sustain themselves from year to year without intentional human cultivation, they out-compete other species through rapid growth or freedom from herbivores, and they have the potential to spread quickly and widely. Dispersal may be by seeds which are distributed by birds, wind, or water, or by asexual fragments or propagules. ***Not all non-native species are invasive***, nor are species uniformly invasive wherever they occur as aliens. One likes to think that the distinction is observed that, in order to call a species invasive, a quantitative reduction in biodiversity is measured in sites where it has moved in, but this is done so rarely as to be deplorable.

Biodiversity education begins with the identity of particular taxa and the history of particular places, teaching the identification of recognizable taxa which have not been previously distinguished, and the historical processes that have assembled the local biota. ***Only when People recognize their native species, know the history of the arrival of both the natives and the non-natives, and feel themselves biogeographically in place will they care about invasive***

**aliens.** If you see *Rhamnus alnifolia*, *Rh. cathartica*, and *Rh. frangula* as only 'bushes' or even as "Buckthorn" you won't recognize the first as a modest native, and the latter two as ecosystem-changing invasives.

**Working down from the top of the canopy of Limerick Forest we find:**

## Trees

These are plantation trees that reproduce by seed or suckering, plus one doubtful species included to demonstrate the ambiguities of classifying species as invasive..

**Scots Pine** (*Pinus sylvestris*) **Other names:** "Scotch" Pine is said to be improperly reminiscent of the beverage, rather than of the country. **Characterization:** The two-needle, orange barked Pine of Europe. Thirty thousand years of high-grading has selected for a knotty and gnarly tree, but it was all that European foresters had to work with, and they imported it into North America with their craft, despite its inferior form and wood when compared to our native Pines. It's the only non-native tree that regenerates in Limerick Forest. **Native species displaced:** Pines and Spruces, also old-field vegetation where it seeds into open fields. **Uses:** Wood. foliage is moderately palatable to Goats. The unsplitable trunks serve as a chopping block until they literally rot away. **Prevention:** Don't plant, or harvest, parental trees, use regeneration for Christmas trees, biomass, or food for Goats.

**White Poplar** (*Populus alba*) **Characterization:** A Poplar with maple-shaped leaves, greyish above and flashing white underneath. It suckers prolifically into conspicuous groves, but doesn't (*yet!*) reproduce by seed. **Native species displaced:** Aspen, and other early-successional trees. **Uses:** Coarse woody debris. Pulpwood? **Prevention:** Don't plant more, cut existing stems, and allow stands to be overwhelmed by shade-tolerant successors.

MAYBE: **Manitoba Maple** (*Acer negundo*) **Other names:** "Box Elder" and dozens of other names are used for this species in the United States. **Characterization:** The compound-leaved Maple that embraces every eastern Ontario homesite. It seems not to have occurred in eastern Canada before the fur trade, but it's not known if voyageurs brought it east, or if it spread north from populations in Pennsylvania. **Native species displaced:** who knows? **Uses:** Eastern Ontario's fastest shade tree, syrup, the premier food for Goats, *etc.* **Prevention:** Probably declining in Limerick Forest as the trees around old homesites senesce.

## Shrubs

In Limerick Forest, "invasive shrub" and "Buckthorn" are synonymous, and in different areas dense stands of one or both species really reduce the habitat and growth of forest floor herbs and tree regeneration. They both bear crops of shining black berries. **Other names:** It seems that you can add "Buckthorn" to just about any adjective to form an English name for a species in this group -- and as soon as such a combination achieves currency it will be abandoned. I've chosen to use frightening-sounding adjectives based on the scientific names here, but there's no real

consensus for either species.

**Cathartic Buckthorn** (*Rhamnus cathartica*) **Other names:** European or Common, Buckthorn. **Characterization:** The semi-tolerant small-leaved Buckthorn, with lenticel-barred twigs often sharpened into thorns. **Native species displaced:** All fencerow, edge, and open-field species, especially Hawthorn, Dogwood, and Canada Plum. **Uses:** Used medicinally as a laxative. Fairly palatable to Goats & Rabbits, berries eaten by late-winter Birds. Urine of Mammals that browse the twigs is bright blue after exposure to sunlight. **Prevention:** Recreational slashing.

**Frangulous Buckthorn** (*Rhamnus frangula*) **Other names:** Usually called *Frangula alnus* in contemporary taxonomies; Glossy, Smooth, Alder, Columnar, European, Black, or Shining Buckthorn are used as the English name. **Characterization:** The shade-tolerant wide-leaved Buckthorn, with thornless speckled twigs, omnipresent under plantations in Limerick South. **Native species displaced:** All understorey shrubs and herbs, forest tree regeneration. **Uses:** none known. **Prevention:** Recreational slashing.

NOT YET: **Common Barberry** (*Berberis vulgaris*) **Characterization:** A prickly shrub with simple leaves and drooping clusters of red fruits; occurs in Limerick North as scattered shrubs. **Native species displaced:** not invasive in Limerick. **Uses:** fruits are used as human food, and also by Birds. **Prevention:** watch for any increase in abundance.

NOT: **Prickly-ash** (*Zanthoxylum americanum*) **Other names:** genus sometimes spelled "*Xanthoxylum*," by authors who felt they had to correct Linneaus' Greek. **Characterization:** A thorny shrub with compound leaves and drooping clusters of reddish fruits. The northernmost representative of a genus of about 250 species of deciduous and evergreen trees and shrubs of warm-temperate and subtropical climates. As a native species, it isn't an 'invasive' even though it invades open areas, and effectively elicits profanity from those who try to make their way through its thickets.

## Forest floor Herbs

All of Limerick Forest, except a few nearly-oldgrowth stands, has a depleted forest floor herb cover poor in the large-seeded species that haven't recolonized after reforestation. This leaves the woods vulnerable to take-over by two really aggressive invasives that are found all around Limerick, but haven't yet been found here:

NEARBY: **Garlic Mustard** (*Alliaria petiolata*) **Characterization:** a biennial mustard with the odor of Garlic, a rosette of rounded leaves in the first year, and a tall stalk bearing white flowers and then clusters of pods in the second year. It's widespread in Ottawa, and found in Kemptville, Merrickville, Burritts Rapids, and Morrisburg. **Native species displaced:** the roots exude a chemical that breaks down the fungal symbioses of native species, often overwhelming all forest floor species, and regeneration of native forest trees, with billows of Garlic Mustard green. **Uses:** originally imported as a delicious winter & spring potherb. **Prevention:** eat as much of it as possible, destroy plants before flowering, don't transport material from sites where the species

occurs, and be very careful about accidentally carrying seeds into sites where the species doesn't yet occur.



**NEARBY: Dog-Strangling Vine (*Vincetoxicum* species)** **Other names:** formerly placed in the genus *Cynanchum*. Black (*V. nigrum*) or Pale (*V. rossicum*) Swallow-wort. **Characterization:** vine-milkweeds (without milky sap) bearing opposite pairs of smooth green leaves and spiky long-pointed narrow green pods on twisting tips of the vines. It has taken over the woods north of the Spencerville Fairgrounds, and is found in scattered roadside patches. **Native species displaced:** most of the forest and oldfield flora **Uses:** none known. **Prevention:** control existing plants, don't transport material that may contain seeds. Biological control work is underway to import specialist herbivores from Europe.

## Aquatics

There's not much open water in Limerick forest, so our aquatic invasives are species of wetlands and roadside ditches.

**European Reed (*Phragmites australis* subspecies *australis* -- haplotype 'm')** **Other names:** Nomenclatorial quibbles recently forced a change from the more appropriate *P. communis*. It's vernacularly called "Phrag" in the United States. **Characterization:** The tall plumed roadside grass so widespread along 400-series highways. Native populations of the species (subspecies

*americanus*) used to be considered rare in eastern Ontario, but they also seem to be spreading onto roadsides, and have been found in many of the local watershed-boundary wetlands. The European form is characterised by its dense growth, smaller flower and seed parts, and rough yellow lower stems (lower stems are shiny & red in natives) **Native species displaced:** The native form of the species, and all other wetland or roadside vegetation where the dense invasive stands take over. **Uses:** Thatching, biomass, fibre. Early spring shoots are said to be edible, but we haven't managed to work out the recipe yet. **Prevention:** spread is mostly by rhizomes carried on equipment, and perhaps germination of seeds on disturbed (roadside) ground, so prevention is mostly a matter of not transporting living material to new sites.

**Narrow-leaved Cattail (*Typha angustifolia*)** **Characterization:** This is the Cattail with narrow heads and leaves, and with a gap between the seedhead and the male pollen-spike above it. It favours drier, higher-calcium, sites than other Cattails. Previously regarded as a native species -- albeit spreading inexplicably northwest during the 20th century, and inexplicably absent from the fossil record -- it has recently been concluded that it was likely an early invader from Europe. It hybridizes with the native *Typha latifolia* to produce the robust *Typha x glauca*, which makes up most of the plants in many marshes. **Native species displaced:** native *Typha latifolia*. *T. angustifolia* colonizes drier sites than *T. latifolia*, so some bank vegetation may be displaced as well. **Uses:** every part of the Cattail plant is used as human food in one developmental stage or another, though *T. angustifolia* is less favoured than the native *T. latifolia*. Muskrats, of course, feed on Cattails indiscriminately. **Prevention:** no longer a possibility in eastern Ontario, but it's still a consideration not to carry hybrid seeds or rhizomes into the interior of wetlands.

**European Frog-bit (*Hydrocharis morsus-ranae*)** **Characterization:** Like little lily pads floating all over the water, with bursts of star-like white blooms, this is Eastern Ontario's own alien, which escaped from a water garden at the Ottawa Experimental Farm in 1937. In the fall, overwintering buds ("turions") are formed along the stems and these sink to the bottom, remain dormant during the winter, and germinate in the spring. **Native species displaced:** All floating-leaved plants, including some native frog-bits. **Uses:** the horticultural beauty for which it was initially introduced persists, though the incentive to cultivate it is removed by the species' present



abundance. It may be used as food by water birds, rodents, fish and insects, but probably not preferentially to the natives it displaces. **Prevention:** The internet records no instances of control. It's probably ubiquitous in Limerick wetlands where it might occur, but colonization might be reduced by care in cleaning aquatic vegetation from persons and equipment moving between water bodies.

**FORMERLY: Purple Loosestrife (*Lythrum salicaria*)** **Characterization:** Tall purple spikes of flowers; the poster child of invasive plants in Canada. **Native species displaced:** Alternative vegetation must have been displaced by Loosestrife, but studies didn't find a

decrease in species diversity in sites where it was dominant. **Uses:** A nectar source for Butterflies. **Prevention:** Over the past decade, and especially since 2001, the introduction of foliage-riddling *Galerucella* Beetles has controlled Loosestrife over wide areas of Eastern Ontario. In many areas where the species was once dominant, it's now stunted or absent. When you see Loosestrife stems that branch and twist, or leaves pierced by little round holes, you're seeing the work of *Galerucella*. The species seems to be finding a refuge in upland fields and standing water, but we won't know for a decade at least what equilibrium is established between the plant and its herbivore. All of our native plants are in some kind of equilibrium with herbivores, and in the case of biological control it's instructive to see the equilibrium established.

## SECTION 7: Wild Forages

Around here there's an amazing paucity of berries, we're since our Plums and Saskatoons are subject to a fungal blight, a lot of our fields are taken over by Cathartic Buckthorn, Tracheal mites did away with wild Honey Bees in 1992, dry lawns on shallow soil seem to produce few mushrooms, and Squirrels get away with the nuts of the few nut trees. In dry summers Black Raspberries dry on the stems before ripening, and fruit production by Red Raspberries is spotty at best. Wildrice (*Zizania*) seems to always drop into the depths before we can harvest it, and some of the wild species we don't go after include *Sagittaria latifolia*.

**Crayfish:** Invasives blight the landscape of foraging for any group where the natives are disappearing, but that just means you can feel you're providing an ecological service by dropping the aliens into salted water, and feeding upon them. Maybe if Wisconsinians had done more of this, the moniker of *Orconectes rusticus* could have been reversed. The standard in astacivory was set by the Simple Native, when he chomped them up whole, disdaining to remove the shell. Anyone can do this with a softshelled Crayfish, and perhaps a metric of simple-nativeness could be devised from the carapace length of the largest intact Crayfish an individual is prepared to consume.

**Unionids:** you can freely substitute freshwater mussels in any recipe that calls for chunky latex. Also they're a good dietary source of persistent organic pollutants and heavy metals. I was introduced to them as food in 1975 in Hornpayne, Ontario, when a taxi deposited me and my supervisor out into the Boreal Forest with instructions to come back for us in a week. We'd neglected to visit the grocery store before leaving town, so we got along on the oatmeal we'd brought to bait mammal traps, and whatever we could catch: a nice series of *Pyganodon grandis* and *Lampsilis radiata siliquoidea* resulted. As with most bland tough Mollusca, mincing or mastication with a thorough dousing in butter and Garlic is the standard recipe.

**Roadkill:** If you drive around a fair amount, you can obtain as much meat as you'd want from fresh roadkills, simply by being ready to deal with the carcasses. Many evolutionary theorists have made scavenging the kills of larger predators (then Carnivores, now vehicles) an original step towards human cerebration, and many a family of Haida Gwaii traces their origin to the discovery of a washed up Whale -- a lump of food as large as a supermarket -- on a mythic

beach, so we're just replaying an ancestral duty as we accept these free gifts.

Fur-bearers and Deer must be reported to the Ministry of Natural Resources, and you've got to eviscerate a carcass before the intestines or bile begin to taint the meat. Those given to riotous self-indulgence just cut the carcass up according to the rules of butchery, while those given to fanatical panutilizationism separate the meat from the skeleton, which is prepared as an osteological specimen.

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29 March 1992

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Canada: Ontario: Grenville County: Oxford-on-Rideau: 1 km SW Highway 16 along Co Road 20. 44.94062N 75.60057W TIME: 1015,1045. HABITAT: rural residential. OBSERVER: Frederick W. Schueler, Aleta Karstad Schueler. FWS 19938, rangerlog/a, *Pavo cristata* (Peacock) (Bird). 1 adult, male, specimen, DOR, forage. M plumage. Roasted, this proved delicious enough to validate the stories one hears about the palatability of this species, and provided Jennie with Peacock plumes for a Hallowe'en costume and craft projects for some years.

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15 November 2006

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Canada: Ontario: Grenville County: Wolford: Co Road 15, 0.5 km N Wolford Centre. 31B/13, UTM 18TVE 355 638.5 44.82710N 75.81556W. TIME: 2230ca. AIR TEMP: 7 ca, light rain, calm. OBSERVER: Aleta Karstad Schueler, Jennifer Helene Schueler. AKS 06 Nov 152230/a, *Odocoileus virginianus* (Whitetail Deer) (Mammal). 1 adult, male, DOR, forage. WAYPT/003, freshly DOR male salvaged for meat & skeleton.

> "Stew Hamill" <shamill at ca. inter. net> wrote:

>> *November 18 is the second Saturday of deer hunting. . .*

\* but providence sometimes supplies, and the Limerick Forest Nutrient Management Workshop will be held over the garage where our buck is hanging! Jennie twice told Aleta "That's our winter's meat!" before she turned around, and they hauled the buck into the van by a rope around the antlers (after removing various layers of carpet and cushions), and then went on to Merrickville to do various good deeds, registering the fact of the road-kill and our apprehension of it with the MNR, before cell-phoning me from the driveway that they had arrived.

Since Jennie's exercise machines still fill "our" half of the garage, our first entry into Kathy's half was to squeegee the water off the floor (in rainy periods the rain runs into the garage, and they're officially comparing this fall to a Vancouver winter on the CBC), spread plastic on the floor, and loop a rope up above a beam and truss. When Aleta had finished phoning her Father in British Columbia on the subject of how to proceed, and Jennie and I had brought rags, knives, and sharpener from the house, we carried the deer into the garage, looped the ropes already on the antlers into that looped over the beam, and by a series of heavings, tuggings, and lashings got the body suspended off the floor.

Then Jennie excused herself from squeamishness, and Aleta took our stout Lee Valley French peasant's knife, and made the midventral incision, extending it up through the sternum with a pair of tin-snips she'd recently bought me for dealing with roofing metal. Rumen, blood and posterior alimentary canal poured forth in sequence into a plastic bucket, and we extracted and washed the greater part of the liver, the heart, lungs, and one kidney. One rib was broken and had punctured the rumen, allowing us to see that this was a Corn-fed animal. Aleta was still wearing her meeting clothes.

Then we sponged out the interior of the body cavity, and propped it open with a stick, and will skin and deflesh in

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the morning. We microwaved a piece of lung for Marigold, who's been kept, faintly whining, in the Lab, and who turned pirouettes on the back stairway as she went up to devour it. Liver for breakfast, and then skinning, defleshing, and filling popcorn bags (our version of wrapping). It will be nice to have a complete antlered skeleton (only one hind leg broken, beside the rib), though this is no massive rack -- just two points on one side and a barely palmate almost-fork on the other.

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The most frequent roadkills are Grouse (*Bonasa umbellus*) and Hare (*Lepus americanus*). In each case, the trick is to get the guts out as cleanly as possible, retrieve the heart, strip the gall bladder from the liver, skin the carcass, pull the lining from the gizzard (of the Grouse), and then skin body.

### **Sugaring: *Whereas: Eastern Ontario is a sugar-producing region***

**and whereas:** Maple sugar is produced from minimally-disturbed mature 'climax' forests which retain almost all of the ecosystem functions and biodiversity of the forests that are the natural upland vegetation of this region

**and whereas:** the delicious flavour and balanced mineral content of Maple sugar products make them the preferred sweetening agents in the human diet,

**and whereas:** a homesite shaded by Sugar Maples can provide enough sugar to supply a family,

**and whereas:** the production of Maple sugar is an important traditional activity, heralding the arrival of spring and providing important income to many People in eastern Ontario,

**and whereas** the Biodiversity Convention requires the federal, provincial, and municipal governments of Canada to favour activities and products that preserve or enhance biodiversity,

**and whereas:** foreign sugars are largely produced on tilled land, with the use of fertilizers and pesticides, greatly increased soil erosion, and greatly diminished biological diversity,

***Be it therefore resolved*** that the Eastern Ontario Model Forest urges all levels of government and all residents in eastern Ontario to:

- 1) favour Maple sugar in preference to foreign sweetening agents, by promotion, preference, subsidy, tariff, prohibition, or whatever other methods are available to them,
- 2) do all they can to encourage sugaring by households and commercial enterprises,
- 3) develop and promote the use of Maple products, in the full range of saccharine products (liqueurs, 'climax forest' & other confections, mineral supplements from sugar sand, *etc.*),

***and therefore*** the Eastern Ontario Model forest will refrain from purchasing foreign sugars, and will maintain and promote a registry of households and institutions which have also resolved to

purchase no foreign sugars.<sup>12</sup>

This is a resolution we were discouraged from introducing at an EOMF AGM. Of course, the Maple trees in your yard aren't really wild, but we've got to be minimally categorical in order to have a text rather than just a maze of cross-references.

There's a couple of tricks we've discovered for sugaring a years supply from shade Maples. Sugar concentration in sap is largely a function of the size of the trees' crown, so shade trees give very concentrated sap. You can tap Hard (Sugar, Black), Soft (Red, Silver), or alien (Norway) maples. The sap runs on bright days after a freezing night. You can also tap Manitoba Maples, but they require a harder freeze than the local species, and the wood decays around the tapholes.

One trick is to take advantage of the low latent heat of fusion of water (80 calories/gram), compared with its high latent heat of evaporation (540 cal/gm). This means that sap can be concentrated by discarding ice that forms in the buckets overnight, or by storing sap in 5-gallon buckets in a chest freezer until about half the volume is frozen. Then you punch holes in the top, and pour off the concentrated sap. Thaw the ice until about a quarter of the remaining volume drains off, and you've captured almost all the sugar in the sap.

The other trick is to avoid marital discord about when to stop heating the house by sugaring on a wood stove: since you're accomplishing dual purposes, the spouse who would advocate the earlier end of the heating season can't protest the wood that's being burned. This may lead to a very slow low-temperature concentration of the sap, but you just need to be careful not to let it cool down and spoil, and to bring it to a full rolling boil at least a few times to skim off the impurities, before bottling when it reaches full concentration.

**Leek:**

*Asparagus:*

*Typha:* Here is a plant that's a paragon of ecological service: primary production, entrapment of sediment and pollutants, the tallest and strongest structural feature of many wetlands, food for Man and Muskrat, and provider of detritus to aquatic insects. Typha marshes are among the most productive habitats on Earth, and it's possible to exploit every part of them, if you're there at the right season (and sometimes the season is only a few days long).

*Apple:*

Lawn Mushrooms:

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<sup>12</sup>Foreign sugars' are defined as refined sugars produced outside Eastern Ontario, except for honey or maple sugar from adjacent regions. Members of the registry promise to buy no foreign sugar separately as sweetening agents for human consumption. The prohibition does not include the purchase of sweet or sweetened fruit, beverages, prepared food, confections, baked goods, or livestock feeds, nor does it restrict the acceptance of unsolicited gifts.

Forest Mushrooms:

**Knothole Mushrooms:** Our last wild food harvest before winter is *Hypsizygus ulmarius*, the Oyster Mushroom that we call the "Manitoba Maple Knothole Mushroom," though the formal name is "Elm Oyster." This species lives for most of the year as hidden thread-like mycelia in the quickly rotting wood of most of the Manitoba Maples in eastern Ontario. There are often "sister" genera of fungi, with seemingly identical characters, except that one causes a white rot, feeding on the secondary strengthening lignin, the and one causes a brown rot by feeding on primary cellulose walls of the wood cells. among the Oyster Mushrooms, *Pleurotus* (which we sometimes see on Sugar Maples) causes a white rot and the closely related *Hypsizygus* causes a brown rot.

About Thanksgiving time fruiting bodies of *Hypsizygus* slowly blossom from scattered knotholes: whitish caps with pale tan gills, held up on stout curved white stalks. Standing dead trees don't have any *Hypsizygus* on them, since they seem to grow only on living or dying trees and trunks. Sometimes the caps are only a few centimetres wide, but in good years most of them are the size of plates, as much as 18 cm across. It often seems as if the mushrooms appear in two 'waves' in early and late October. There's a blackish mold that grows on the tops of the caps of some of the older mushrooms. Red Squirrels also forage for them, and they'll leave caps chewed on, or hung out to 'dry' on branches.

We peer up to see the clear white points glimmering in the dark canopy, and cut them from the trees with a knife on a long pole. Their flesh is firm and dry, not easily damaged by autumn frosts. This delicious and safely-edible wild mushroom is easy to identify, as no other gilled, stalked, white fungus grows on Manitoba Maples at this season in our area. Tough and rubbery if cooked fresh, they are tender and flavourful after they've been sliced and dried, then soaked before cooking. *Hypsizygus ulmarius* is widely cultivated for food under the Japanese name 'Shirotamagitake.' The name '*ulmarius*,' suggests growth on Elms, but the only one we've seen on an Elm was on a tree drowned by Beaver-flooding, so they don't seem to use Elms killed by Dutch Elm disease, which is how most of our Elms die.

## CHAPTER 6: Health

Not surprisingly, the foremost theoretical Canadian field biologist has written the most trenchant appraisal of human biology (Geist, 1978, Life Strategies, *Human Evolution, and Environmental Design*. Springer-Verlag, New York, 495 pp., ISBN 0-387-90363-1). Valerius Geist proposes bold evolutionary scenarios to explain many of the characteristics we seek to promote in our children and ourselves, and an uncompromised vision of a sensible society. He defines health as the condition in which the characteristics that distinguish a species from its relatives are best developed (in our case including large brain, high capacity for exercise due to evaporative cooling, manual and bodily dexterity, highly developed intellect and language, music, tool manufacture and use, dance, visual mimicry, role playing, altruism, humour, self-control, complex traditions, and long life span), and documents what is known about environments that promote this kind of health.

Everyone who hopes to live successfully as a Human Person, in eastern Ontario or elsewhere, should study this volume, though it's so packed with ideas that it can sometimes only be taken in doses of 15 minutes or less. Valerius reports (Sun, 05 Sep 2004 23:48:11 -0700) that “[m]y life-strategies book is my most important work, followed by my more recent *Deer of the World*. I started on that intellectual journey because I was teaching a course on how to maximize health environmentally to graduate students in a professional faculty. In teaching about health, the question what is normal and what is not faces one continually. And there is no better way to discover what is normal or not than following the evolutionary history of our species. It ended for me years later with the realization that 'health' is tied so closely to wealth, that generating health is an inescapable by product of being wealthy. That is, given the wherewithal, human beings readily generate 'health' on their very own with little need for specific guidance. To generate a healthy population was thus a matter of economics and not environmental prescriptions, and how to make people wealthy was not my expertise!

“I did not express it in that book in this way, but 'health' is a product, a consequence of organisms preparing themselves for reproduction. However, since organisms are driven emphatically to reproduce, "health" is an inevitable outcome, provided the individual has the resources to prepare itself effectively for reproduction. So, one winds up again with wealth or access to resources as central to health. Maximizing individual competence is another way of stating much the same.

“...The book led to correspondence with, primarily, professors emeriti! That says something about reading habits! It has become a bit of a cult book among evolutionary psychologists. And, yes, its intellectual content has weathered quite well, some of it affirmed and little disproven, which implies that the 'interdisciplinary' approach is powerful - provided one has the freedom to practice it -- which one does not in university line departments!”

Everyone should also read *Deer of the World*, which is a very useful book for helping one think about the local & Canadian landscapes, because it generalizes at levels, and about classes of facts, that are significant at a human scale, but aren't often thought about. As you come to each of the major genera you say to yourself - *THIS* is his favorite genus of Deer, only to find that, no,

the account of the next one is just as excited, or maybe more so, until when one gets to *Rangifer* it is obvious that the treatment has been perfectly even-handed (considering the deficient data available for tropical and Asian genera).

## Section 1: Pathogens & the Germ Theory of Disease

O worship the fridge all powerful above!  
and crowd up its shelves by giving a shove.  
There's nothing without it can ever be saved:  
all things held without are swiftly decayed  
Only in its precincts are germs ever fazed.

The acceptance of the germ theory of disease, as worked out by Pasteur, Koch, and others, in the late 19<sup>th</sup> century, spawned a fanatical identification of all micro-organisms as pathogens. That this isn't the case is most strikingly shown by the synthesis of Vitamin K by gut bacteria, but many in the public, and especially in the advertising industry, have been slow to assimilate the idea that only pathogenic micro-organisms cause disease or discomfort.

In the winter, an ANOVA-built house that's uniformly 22° C inside and whatever outside, can be very frustrating when the fridge, but there's a gradient of temperatures in a regression-built house, and foods liable to spoilage can be stored in hallways, nooks, and porches where they'll last long enough. But remember that swift decay does occur when temperatures rise above 15° C – for every 10° C rise in temperature, biological rates double.

## Section 2: Food as nutrition

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Life is the ghost of Death  
And the White Goddess  
Is the Red Queen.

3 June 1989, Hecate Strait, B.C.

\*\*\*\*\*

A central point of religious principle, overlooked, evidently since St Paul's time, is that the words of institution presuppose an existing ongoing activity "*As often as you do this...*" which means, as far as I've ever been able to figure out, that the ritual prescribed in the Eucharist is not setting up a new activity, but is simply inserting a new understanding of, and meaning for, ordinary sit-down meals of eating and drinking. It's clear that the central sacrifice-like events in ecology are the transfer of material and energy between organisms, with or without the death of the donor, and that evolutionary change occurs only because of the increased mortality (or decreased reproduction) of particular genotypes. Consumption (ecological-speak for eating) combines both

of these: transfer of matter and energy from the prey to the consumer, and selection against the captured prey - or, in cultivation, group selection for the favoured variety that produces favoured food, while the individual (or organ) dies to curry this selective favour. I'd bet that in Jesus' mind, the Eucharist was meant to have been a deepened and made-historical 'grace' before meals, not a magic Sunday-morning congregational ritual - He died, and food dies, to support life, just as stories die to increase understanding - the lesson is to recognize the parallel, and that life and understanding grow only through these deaths.

So all food is a sacrament, made up of the lives and ecological costs that produced it, and it's desecrated when this history is ignored. Suitably celebrated, it includes a knowledge of the history of each ingredient in each dish, and the closer to home the food has grown, the more complete the consumers knowledge of it can be.

"As a rule, processed foods are more "energy dense" than fresh foods: they contain less water and fiber but more added fat and sugar, which makes them both less filling and more fattening. These particular calories also happen to be the least healthful ones in the marketplace, which is why we call the foods that contain them "junk." Drewnowski concluded that the rules of the food game in America are organized in such a way that if you are eating on a budget, the most rational economic strategy is to eat badly - and get fat.

"This perverse state of affairs is not, as you might think, the inevitable result of the free market. Compared with a bunch of carrots, a package of Twinkies, to take one iconic processed foodlike substance as an example, is a highly complicated, high-tech piece of manufacture, involving no fewer than 39 ingredients, many themselves elaborately manufactured, as well as the packaging and a hefty marketing budget. So how can the supermarket possibly sell a pair of these synthetic cream-filled pseudocakes for less than a bunch of roots?

"For the answer, you need look no farther than the farm bill. This resolutely unglamorous and head-hurtingly complicated piece of legislation, which comes around roughly every five years and is about to do so again, sets the rules for the American food system - indeed, to a considerable extent, for the world's food system. Among other things, it determines which crops will be subsidized and which will not, and in the case of the carrot and the Twinkie, the farm bill as currently written offers a lot more support to the cake than to the root. Like most processed foods, the Twinkie is basically a clever arrangement of carbohydrates and fats teased out of corn, soybeans and wheat - three of the five commodity crops that the farm bill supports, to the tune of some \$25 billion a year. For the last several decades - indeed, for about as long as the American waistline has been ballooning - U.S. agricultural policy has been designed in such a way as to promote the overproduction of these five commodities, especially corn and soy.

"...The result? A food system awash in added sugars (derived from corn) and added fats (derived mainly from soy), as well as dirt-cheap meat and milk (derived from both). By comparison, the farm bill does almost nothing to support farmers growing fresh produce. A result of these policy choices is on stark display in your supermarket, where the real price of fruits and vegetables between 1985 and 2000 increased by nearly 40 percent while the real price of soft drinks (a k a liquid corn) declined by 23 percent. The reason the least healthful calories in the supermarket are the cheapest is that those are the ones the farm bill encourages farmers to grow." **You Are What You Grow**, by Michael Pollan, The New York Times, Sunday 22 April 2007 [http://www.truthout.org/issues\\_06/042507HA.shtml](http://www.truthout.org/issues_06/042507HA.shtml)

**Cookery:** one thing that doesn't seem to be widely appreciated is that by following a few simple rules lascivious ingredients can always be combined into a succulent product -- salad, theory of

white sauce, the trick is to use locally grown ingredients of low appeal to create succulence.

Watch out for persistent organic & metallic pollutants...

### Section 3: Food as Medicine

**Subject:** Re: Teeth, diets, non-hernias...

**Date:** Thu, 13 Aug 1998 20:43:09 -0700

**From:** Karstad-Schueler <bckcdb@istar.ca>

**Organization:** Biological Checklist of the Kemptville Creek Drainage Basin

**To:** Elsen Karstad <elk@arcc.or.ke>, Karen & Gary <krathbun@ns.net>, Lars & Martha Karstad <eland@wkpowerlink.com>, Mark & Donna <mkarstad@epsb.net>

**CC:** Nancy Hill <nancyh@interlog.com>

Karen,

I started this just to you and Gary, but reading back over it, I find it is a pretty concise description of my "food-as-medicine" beliefs (actually, it's not hard to think of food as medicine when you live with a diabetic!), and thought it might be interesting for the whole family: like, "so this is what makes Aleta so weird!" So here it is:

When I wrote:

*>> no-fat (no bread, no pasta, no tomatoes, no spices), rice-and-one-or-two-vegetables diet for a week or two, and see if discomfort goes away. Then gradually add other foods, one at a time, for three days at a time, and see what happens.*

...and you answered:

*> I read this to him, and he said he figures losing weight will definitely help (seems that's in his plan) but he wasn't planning on doing it quite so drastically! Anyway, the advice has been passed on..*

...perhaps you misunderstood. I didn't mean a weight-loss diet. I meant a diet to avoid all things that may possibly irritate or even stress the digestive system, for a while, and if the discomfort goes away, then proceed gradually to return to a normal diet, one food at a time, to see when discomfort returns. You can even do that before going to a different surgeon for a second opinion. Then you'd have more information to give him - whether the elimination diet worked, what foods trigger the discomfort, and whether it didn't work, the discomfort remaining even on the strictest, blandest, "zen-macrobiotic"-type diet.

Then I would think that something may be structurally wrong. Gary may even have an uncomfortable adhesion from a previous peritoneal (within the abdominal cavity) infection that

he may not even have been aware of as such. I had a considerable amount of discomfort after my appendicitis, until the second operation, when the surgeon spent a couple of extra hours undoing adhesions, where various loops of the bowel had healed onto each other! I'm not saying that would be the case with Gary, but it's an example of a non-tumour, non-hernia, non-bacterial, structural problem.

I'd rule out diet-related problems first. Diet-related problems are common, extremely diverse, and controversial. You can read all kinds of books on diet as it relates to health and disease. If I were really in trouble, healthwise, I'd tend to a far-eastern diet, because Chinese tradition treats food as medicine, and they have a lot of experience in how foods affect disease and how they maintain health. Maybe my sense is not a good enough recommendation, as I don't have very good understanding of this medicine - I just respect it from what I have come across - and the big turnaround in my own health came when I began to treat food as medicine - not culture, not social, not comfort, not recreation, not distraction, but everything that went into my mouth as something which directly related to health and healing. With that attitude, I had no trouble avoiding foods which I had craved, or which had been my favorites. Cravings gone. Different food attitude.

Eastern Tradition or not - I am convinced that avoiding all foods (or even all activities) that can possibly place stress on any "system" of the body, is the surest way to regain health. We haven't given our bodies a fair chance to heal themselves if we have not tried this. The reason I suggest avoiding fat relates to liver, gall bladder, and intestines (for the possibility of their being stressed in the digestion of fats). I suggest avoiding pasta and bread, because of the possibility of even a mild wheat allergy complicating things, perhaps in many ways (although there are alternative-grain pastas and breads - one must read ingredients, even if something is \*called\* rye, or soy, they put wheat in everyting, even in mushroom soup). Starch digestion itself is difficult for some people, and I think it is those people who do best on a "food combining" diet that separates starch from fats and starch from proteins. Alternative grains (which should also be rotated, because obviously you're trying not to strain yourself with "too much of a good thing") are rice, millet, oats, rye, kamut, quinoa - and there are also starchy vegetables like potatoes, yams, squash, etc., and beans, lentils - legumes of all kinds (with which a little "beano" can be helpful). Our ancestral diet was vegetables, although nowadays many people actually dislike them because of childhood food-politics imposed by adults. Sugars (even fruit sugars, though they are not quite as bad) exacerbate yeasts in the body, and these can affect almost every system, causing distinct symptoms as well as subtle ones like depression, headaches, weight problems, fluid retention, (mysterious pains?) etc. Anyhow, one doesn't really have to try to understand how all this works, if one just decides to eat like a monk for a while as a simple experiment in avoidance.

That's food theory according to me, Love, Aleta

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Subject: Selective Ingestion  
Date: Fri, 14 Aug 1998 08:18:48 +0300  
From: elk@arcc.or.ke (E.L.Karstad)

To: eland@wkpowlink.com, bckcdb@istar.ca, krathbun@ns.net, mkarstad@epsb.net, southesk@telusplanet.net

Well put, Aleta.

Certainly no doubt that the vast majority of people pay little or no attention to how they process what they eat. A reliable subjective awareness of your body's responses to varying diet components must be a very difficult database to acquire.

Could you outline some of the 'tools' you use? First you must become sensitised to how your system reacts to specific inputs, so I guess this question would have to be addressed in two parts- the first you have already mentioned- being laying down a reliable base line with a very simple but still nutritious diet that is (almost) guaranteed to be non-irritant, and sampling various foods from that point. The second, and what I'm curious about, is what sensory 'feedback' (sorry) you look for. I suppose the third issue would be the 'why', but that's a bit more academic, and need be investigated only for medical solutions and curiosity.

I have seen that the sub-science of human nutrition, as opposed to nutrition in general, has become clouded with a tremendous amount of hype and mumbo-jumbo. In order to feed refugees on a single staple diet, human nutritionists floundered around for years during the initial Somalia problem before turning to animal feed technology to sort things out. They still won't follow the tried-and-proven protocols on how to make money raising pigs and remain, on the whole, reactionary. Scurvy or beriberi must be present before micronutrient fortification is advocated. There is little connection made between the common lethal epidemics of malaria and measles and Vit. A deficiency. A good proportion of the population must go blind before a response is made. Hidden Hunger remains well hidden.

The major difference between animal and human nutrition remains the area you are expert on Aleta- our ability to investigate and perceive our own metabolisms and well being. This type of investigation should become as logical as is possible in order to have the desired positive effect. So many people are not logical and would be prone to over-reaction and misinterpretation of the signals they receive from themselves. Subjectivity at it's most intimate.

I think that you and Fred would be able to come up with a set of guidelines- pretty much straight off the top of your heads- that could nigh-on set the 'science' of human nutrition (there's got to be a better term for this though) on it's heels. A user's handbook to the gut and points north and south so to speak. A traveler's guide to the metabolism. An explorer's handbook to optimal nutrition.

Think about it. I'll help fund publication. -- Love; Elsen

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My initial response when Fred said that you were interested in nutrition in refugee camps was:

Tell them to receive oilseeds, and press their own fresh oil. Fats are essential to tissue and organ health, and all fats that are processed, expelled, refined, etc, and even those in meat, become rancid in storage (especially in warm places). I'm sure that for this reason, very little oil is sent to refugee camps, and my bet that what there is will be rancid (full of free radicals, and also able to destroy what little vitamins are contained in the diet (this last fact needs to be substantiated - it is just something I've heard). Grinding of whole grain into fresh flour is also a good idea - you've heard that one from us before.

My next thought related to the phenomenon that you call "Hidden Hunger" - a great term! People who are malnourished cannot think well, and do not use available resources effectively or creatively, because they have little strength to spare for anything except "hand-to-mouth". Perhaps there is a madness to that method, like "keep them weak, and they won't make any trouble (won't think creatively and decide to govern themselves, or interfere with their neighbours)". But on the positive side, if the food aid to a refugee camp (and we need only begin with ONE refugee camp or cardboard suburb) actually supports good health, rather than unhealthy subsistence, a vital community will arise and the people will work together to better their conditions - because they love their families.

**Fred writes:** There may not be a single suitable diet for People in general, both because of individual variation, and because People's digestions are conditioned by the diets they have eaten in the past. I wonder if you need to be really sick (diabetes is a good starting point) to have full sensitivity to the effects of dietary events. Some of us (FWS) are sensitive to carbohydrates, and only subtly and coarsely to 'allergic-like' reactions while others of us (AKS) can feel sensitivity to foods, drugs, and vitamins within minutes.

And: One characteristic of advanced or alternative nutrition ideas is that they are often promoted by People who are trying to sell a book or plan or product, and don't direct their message to the impoverished, who may really need it most. It's like herbal remedies, where you would think that half of the benefit would come from growing or knowing the source *as a Plant*, but the literature usually doesn't tell you how to grow and harvest the plants, because the authors want to sell it to you in pills just as pill-like any synthetic drug.

**Aleta again:** The only charity that we donate money to (even when we're in the red ourselves) is Inter Pares (Among Equals), who have many years of experience with helping people help themselves, sustainably. I haven't heard that they do much in the way of "relief" support. It's all in development, like Bridgehead & Oxfam, but with a rather careful, scholarly, money-spent-in-the-very-best-way approach. I wonder if they have a website, and I wonder if they are doing anything innovative about education in nutrition in the communities they've been involved with.

If we were to, say, accept money from you or from the World Bank (which you apparently have wrapped around your little finger) to produce something which could be used as a nutrition manual for folks offering relief to people in crisis, it sure would mean a big research effort to substantiate some of our "common knowledge" - a big time commitment. We couldn't commit to that with the Museum in the "intensive development" stage. It would certainly be fun to start

planning and figuring, though. Perhaps you could do a bit of searching, quietly, to find out if anyone else has such a project going.

In reply to your question about how one can learn to feel one's response to stressful foods:

I was really thinking about Gary's situation, where he has this mysterious discomfort (which I've only heard Karen speak of, and not in great detail). Such a symptom could be used as an indicator if it disappeared on a very simple, nutritious diet of good quality. Totally innocuous foods, like white rice, cooked carrots and green peas, for a week - or on a week-long water and juice fast. If the physical problem disappears or alleviates, then switch from white rice to brown rice (for better nutrition) for another few days, and then begin to alternate rice with potato, or replace it with potato for a week - all the time watching for recurrence of discomfort. Then add a Crucifer such as broccoli to the diet for a week, and then add oats, and carry on adding one food each four-days-to-a-week, gradually ending up with those that are known to cause problems for some people, ie: spices, tomatoes, dairy products, soy, wheat products, cane sugar, red meat, etc. (Some people are sensitive to fruits, vegetables and meats grown with the use of chemicals, so "organic" may have to be tried). The trick is to do it slowly, and one-at-a-time, feeling for familiar symptoms of malaise.

A one-week initial diet change may not be effective at alleviating symptoms of physical problem. Then the experiment is not so clear-cut. All kinds of variations are possible, like a longer initial stage, or a non-starch (juice and nut) diet. But very few problems fail to respond to improvement in diet. The difficult thing to decide is just what, for a particular individual, is improvement. (That's why I'd start with innocuous foods.) A popular trend nowadays is to ADD nutrients and herbs to improve health or alleviate disease. I operate more on the idea that health should stabilize when irritants and inappropriate foods are REMOVED from the diet. Many times supplements contribute to health problems, especially in very sensitive or sick people.

So, how do you know when foods are okay? Well, you no longer have post-nasal drip, or a tickly throat, or blocked-feeling ears, or achy joints, or nagging headaches or constipation or gas, or abdominal discomfort, or a hard time waking up in the morning, or a hard time getting to sleep, or recurrent abscesses or boils, or frequent colds, or chronic bronchitis, or depression, or whatever ails you.

How do you know when a food is not okay? If you haven't had a certain symptom for a while, and then it returns after you reintroduce a certain food to your diet. When there is a definite allergy or sensitivity, the response can be dramatic, like my ears blocking up when I ate soy or corn, a few months after having removed them from my diet (I can eat them both now, as my general health is better, and I backed off and introduced them more gradually) or when I first noticed the skin on my lips feeling dead, only half an hour after eating wheat pie crust, and then peeling the next day - this after a couple of years of avoiding wheat on the recommendation of my naturopath. Sometimes, however, the response to inappropriate food is more subtle - a reduction in vigour, and a weakening of immune response.

After two years of replacing Wheat with its ancient relative, Kamut, I began to suspect that I was developing a sensitivity to it because I no longer felt generally fit and lively - I had begun to feel a bit sluggish - like my "old self", so I went off the Kamut and began to feel more lively and energetic within a week. This can only be done on a pretty healthy diet, to begin with, as it happened that Kamut was the only thing that had been bothering me at the time, so I improved as soon as I eliminated it.

Some people are "doing" several things that are inappropriate for them, and quitting one may not make much difference. That's why I think the elimination method is best, where one starts with a very simple diet. Some people do a fast or "cleanser" before they begin. Now that I've been pretty healthy for a while, I don't get as definite a reaction to foods that aren't a good idea to eat a lot of. I'd have to eat a lot of them before I found they were bad. Every once in a while I do that - like going off my food-combining two or three times a week for a few months - and realizing that it hadn't been a good idea, because I began to have gassy periods at night, and lost that light, clean, energetic feeling.

I could go on about myself - but I'll just finish by mentioning that it often helps to have a "second opinion", to verify one's own impressions of "should and shouldn't". This I get by having "muscle testing" done by my naturopath, Susan. Sometimes I am surprised at what we find. Sometimes, as in the case of the growing Kamut sensitivity, my suspicion is corroborated. This "second opinion", or alternative testing, helps one learn to interpret, or have confidence in, one's own sensations. (Muscle testing is an ancient, Sikh practice.)

## Section 4: Exercise

“Located antero-posteriorly, and extending dorso-ventrally and sagito-laterally, find the *corpus* or *body* of the specimen” -- universal introductory instructions for dissection.

It's a popular fiction that one ought to take time and effort to waste time and effort in activity intended only to exercise one's muscles and circulation. Since there's lots of money to be made in selling complex leggy machines which will only be used 15 times before being shoved out onto the back porch, and years-long memberships in clubby gyms that will only be visited 3 times, it's no wonder that the popular media endorses this fiction. The 20<sup>th</sup> century has demonstrated that it's possible to automate things to the point that no significant physical activity is left in a lifestyle. “*E-mail blurs the line between inactivity and over-exertion,*” but without providing the conditioning that real over-exertion does. Those who strive to live an orderly life will see that some subset of their activities does involve real over-exertion, so that they don't have to engage in artificial exercise, which is here redenominated “aerobic masturbation.”

## Chapter 7: Reproduction

Valerius Geist, 1978, *Life Strategies, Human Evolution, and Environmental Design*:  
“Education ought to be based on face-to-face instruction, that is, tutoring, in which the peer groups of juveniles should be very small, and always smaller in number than the group of adults... maximum attention is given to each developing individual with the greatest economy of instruction[,] tutor and child...know each other well [through] a long association. Learning should be based on play mimicking adults, which of course requires that the actions of adults be... accessible to the observations and questions of children. The children should be able to participate in or observe economic activities, ceremonies, and festivities cherished by adults [and] have ready access...to nature...and to man-made environments” (p. 419).

We conceive children in an over-populated world only in the hope that they'll be more of a benefit than a burden to the planet, so we've got to bring them up to be such a benefit, and to try to convert as many others to see the importance of this way of life, not only because elsewhere lies disaster for all, but because it's inappropriate for a member of a social species to be a burden rather than a benefit.

Modern youngsters are assailed on all sides by insipid pleas for environmental life-styles, but these are usually highly abstract, urban- and anthropo- centric appeals. We need to expose as many kids as possible to the inhabitants of the real world, what they can know about them, what kinds of things are unknown about them, and how to study them. We need to tell kids about the possibility of a deep life-long affiliation with a particular taxon, and to present biophilia as a viable alternative to anthropocentric creeds such as consumerism. The religions that rehearse the event of conversion, are, after all, those where conversion events are most common. If kids never hear or see that the life of a naturalist is a rare rip-roaring hoot, as well as being the most worthwhile crusade possible in the present age of the world, only the most exceptionally motivated will discover this life for themselves. We've got to encourage academic freedom in the schools, and try to offset the distressingly widespread anthropocentrism common among home schoolers.

Such exposure is easiest in a peasant-scholar household where parents largely work in the home, and children routinely “participate in or observe economic activities, ceremonies, and festivities cherished by adults [and] have ready access...to nature...and to man-made environments.” Such instruction is similar to that seen in many aboriginal hunter-gatherer societies, where “unschooled” children mingle or wander around without the “discipline” imposed in more hierarchical societies.

Within a family, order is very largely a matter of traditions, – e.g. the Schueler affirmation of whatever offspring attempt, on the assumption that once you've been through a Schueler childhood, you've learned to do what's right -- though each generation twists the traditions to fit their circumstances. The trick in life is for each generation to learn from the mistakes and successes made by the generations before. In order for this to happen, stories must be composed and repeated, and their lessons constantly re-evaluated in reference to the experience of the wider

world.

## SECTION 1: North American Food Torture

(for Parent to Parent, *circa* 1982)

We characteristically deny our children rights that the legal system accords the basest criminals, and then wonder why they grow up into rebellious adolescents and screwed-up adults: the right to a fair hearing, presumption of innocence, and the right to appeal. Our dealings with our children are at a level of sophistication that in political life would be considered feudal or tyrannical. We have not learned the lesson that the Henry II figured out: that people's affection can be bought very cheaply by justice. The most fundamental lesson of animal psychology, that vertebrate animals are happiest in an environment that they perceive that they are able to control, escapes us. The presumption of innocence means that we must ask "Do you know what that banging noise is?" not "What are you doing?" The parent has a perfect right to know what is making a banging noise, but may not need to know at all what the child is doing.

Often the most intense emotions between parents and children are aroused by forcing children to eat food. Because eating is the process of making non-self into self, food is symbolic of much about the way we feel about ourselves, and in a social context, the customs surrounding food are directly symbolic of our relationships with others. Not only are we what we eat, but we are how we eat. When parents make children eat or withhold food so that the personal feelings of the child are subjugated to inflexible rules or arbitrary, autocratic decisions, the child is made, by the family eating practices, and the intimate, personal act of eating, to have no autonomy whatsoever, and to accept, intimately, the role of a slave. The classic role of slave rebellion, procrastination, trying the master's patience, and stupid stubbornness, are played out at millions of dinner tables every day.

The frauds that pass for arguments supporting this tyranny are always transparent to a child's sense of justice and even more so to a disinterested outsider. If so much nutritionally worthless dessert is served that it will compromise the child's health unless it is diluted with a last mouthfull of potatoes or carrots, then it will doubtless compromise the child's (to say nothing of the parents') health if eaten with the potatoes. It will likely not enhance the child's Moral Fibre As An Adult to have been forced to consume excessive food as a child, but it will likely predispose him to eat to excess as an adult. If an incompletely consumed child's portion of food is so valuable that it is worth the kind of unhappiness that it so often precipitates, then surely there are ravenous Dogs, siblings, or parents who would be glad to eat it up. Foraging theory and allometry teach us that smaller animals should be more selective in their choice of food, and require a richer diet, so portions of starchy food that are appropriate to an adult are likely physiologically boring to the child. And in any case, it is not the child who buys the soda pop, ice cream, sugar cereal, potato chips, orange juice, chocolate cake, banana cream pie, cookies, Jello, Kool-Aid, candy bars, and doughnuts that are supposed to endanger his health: if this junk is in the household then the parents have their own bad judgement and their own desire for

moral, physiological, and financial bankruptcy to thank for it.

Simple applications of allometric and foraging theory demonstrate that smaller animals require more frequent meals made up of nutritionally richer food (Peters 1983), growing animals require more protein than nongrowing adults, and mammalian sexual maturity requires changed responses to pheromone-like odors and tastes, so children should be presented with many small meals of good high-protein food, with the opportunity to select relatively bland flavours. If a child is reluctant to sample a novel food, then a furtive sally by the parental fork onto the child's plate will do more than lectures, beatings, dessert deprivation, or forced reingestion of regurgitated portions to convince the child of the food's desirability. The fact that a parent consumes his rejected portion is the strongest possible lesson to a child that a food is acceptable. The pathological craving for refined sugar so often shown by children is not intrinsic, but is usually a result of holding candies and desserts out to them as the ultimate reward they can attain.

From their weaning onwards, calmly raised children often prefer rabbit kidneys, kippers, blood sausage, and smoked whitefish to candies and cake, and clamour after spinach, brussel sprouts, carrots, lambs quarters, and the staminate flowers of cattails, but they tend not to favour vast quantities of dryish bread, potatoes, pancakes, or rice, and who can blame them. It is often observable that children are denied access to the ameliorating condiments that adults apply to these starches, even while they are insisting that their children choke them down dry.

When visiting in households where this North American Food Torture is practiced, it is important to remember that Food Torture does not constitute child battering under most provincial or state statutes, so there is no provision for legal intervention in these domestic wars of stalemate. Your only recourse is to invite the child to your house, without the parents, and feed him a few calm meals.

## SECTION 2: ELSA LOUISE SCHUELER: 20 July 1979 - 7 May 1985

Elsa, the little girl who pulled her father into the ditch whenever a vehicle was audible on any road within earshot, who pitied roadkills even as she gloried in their intact freshness, and who loved best the rainy nights when, in the light of her headlamp, she could close her steady little hand around the silent frogs crouched on the streets of her beloved village, is dead. In the glare and blackness of a wet city night she mistook the narrow entrance ramp of a Montreal highway for the shoulder of a country road, and, like a sparrow from the hand, was gone.

As her father I must now add a third to the two pivotal thoughts in my history that proved truer and more important than they seemed at the time. In High School American History I concluded that the Loyalists were really more reasonable than the Patriots, and in a Toronto communal kitchen I reflected that, since one would doubtless one day marry, one would meet one's future wife not knowing her for that, and that she might even be that black-haired girl over at the stove. I now must add Father Darwin's account of the loss his ten-year old daughter Annie, "the joy of

the household, and the solace of our old age", and my comparison of toddler Elsa to her "buoyant joyousness, tempered by ... sensitiveness ... and her deep affection", not knowing that Elsa would die younger still.

I have always learned social and moral theory more easily than I have learned social conventions, and I was subverted in my youth by the writings of Saint Paul, John Wesley, Henry David Thoreau, Charles Robert Darwin, Walt Kelly, Loren Eiseley, Peter Freuchen, and Aldo Leopold. From the ideas of these notorious proponents of the paradox of freedom I have come to value dispersion of biological nutrients into the environment over the glories of the flush toilet, economy of food consumption over the fear of Garbage-eating, old houses and used equipment over plastic-wrapped novelty, freedom over conformity, truth over comfort, the variance over the mean.

If I now boast of my theory of human development you can perhaps listen in it for the foolishness of God, for the sake of the sweet girl who was raised in accordance with its principles, who corroborated its predictions with such heart-rending goodness, happiness, independence, and careful thought, and who died as a sacrifice to its perils.

Raising children in freedom, and in it their astonishing ability to learn and live harmoniously with adults, is the aboriginal practice of our species, but in many civilized societies it has been replaced by a vision of children as mindless lumps, growing up into hellions, who must be forced to learn a minimal dose of unpalatable scholarship. To those who have tried to raise children in the old way in our society it will be no surprise that when asked how old Elsa was a neighbor answered "five, going on thirty," that at the local kindergarten (which she attended over her parents' protests) she managed a poor report in Fine Motor Skills, despite her ability as a seamstress, because the school thought that colouring large areas with stubby crayons was a fine motor skill, or that from the age of two she mediated her parents arguments, generally showing better sense than at least one of the participants. Our policy from the first was to treat her no differently than we would an adult, except insofar as her physical or physiological limitations made different treatment necessary.

This reduces the entire educational process to astonishing simplicity. One does not quiz one's child about how-much-he-knows any more than one would one's uncle. One does not force a thousand facts on one's child in place of a general theory any more than one would on a friend. One does not shy away from explaining difficult material to one's child any more than one would from explaining technical matters to an expert in another field. One does not arbitrarily order one's child about any more than one would a colleague. One does not deny one's child security and affection any more than one would one's spouse. Of course one's words must be scaled to the child's understanding, and some of the daunting richness of adult conversation must be sacrificed to simplicity and repetition, but the impressive thing about this approach is its efficiency. Once, having been warned that knives are sharp, the child has cut her finger, she need not be reminded of that again, and once she has learned that most parental requests can be modified by discussion she need not question those that are orders. The purpose of reproduction is not to raise helpless and ignorant children, any more than the purpose of education is to produce illiberal "certified"

teachers: we are raising adults to live in a world threatened by ecological and thermonuclear disaster, which will only be rescued by intelligence, compassion, and responsible behaviour.

One thing that I valued about my upbringing was the extent to which we "talked back" to my parents (though it was nominally forbidden). With Elsa we were determined not to suppress reasonable discussion of our requests for her action. Once when she was staying with a family of friends she was asked "Would you like to pass these muffins around to all the children?" to which she replied "No, I think I'll eat them all myself." At home there was a whole hierarchy of forms for requests for action, starting with "Would you like to..." and running through "I would like you to..." and "Please..." to "...That's an order," and, as in legal appeals, the request could be dropped or modified at any stage before the last. If she didn't want to do something but thought we might insist on it she would often shorten the process with "I will if it's an order." We tried always to tell her when we accepted her arguments, rather than silently letting her "disobey." This is very important in making the reasonableness of the parents' behaviour evident to the child. A parent need not only be reasonable, he must seem reasonable to the child, because the child is engaged in learning what is reasonable, and the reasonableness of his parents' behaviour is the most important thing in the world to him.

We know that freedom works for children, and we know that it works for adults. We have known since Plato that democracy is the worst possible form of government except for all of the others that have been tried, we know from the testimony of the Inuit and Darwin's children that love is the best form of discipline, and we know from John Holt that the best form of schooling is no school at all. The religious can see the roots of this paradox in the freely given love of God for the World, and the materialist can see it emerging from the life-from-death of Natural Selection, but we can perhaps tell a story that points out more specifically why, for people, freedom is a better discipline than regulation is.

In the deep roots of our evolutionary past we can tell the story of the lineages that led to people as a series of choices for the risks of freedom in cooperation and away from the certainty of forced regulation. The first molecules that banded together to form a living cell in the thin warm soup of the Earth's earliest seas chose the uncertainty of life over inorganic order. Long ages later some of their descendants cohabited as eukaryotic cells of cilia, chromosomes, and mitochondria, and chose the complexities of sex over the simplicity of procaryotic fission. Then, when cells grew together as organisms, our ancestors became morphologically flexible Coelomates rather than paint-by-number Pseudocoelomates, behaviourally flexible Vertebrates rather than lock-step Arthropods, learning Mammals rather than instinct-bound Birds, cooperating Primates rather than combatitive Rodents, and talking People rather than gesturing apes.

This is not to say that evolution was dominated or driven in any way towards freedom, choice, or intelligence, simply that we can look back on our particular lineage and see a long series of such choices. In other lineages natural selection has favoured what we regard as degeneracy or tyranny. The choice of freedom has never been necessary: the Earth would spin through space without passengers, biogeochemical cycles would roll along in the care of prokaryotes, Insects

outnumber Vertebrates as Rodents outnumber Primates and tyrannies outnumber democracies. Nonetheless, in the organization of large systems flexible, cooperative feedback has come to predominate over rigid preprogramming, both among the larger animals, and in the dominance of insect-loving, sprouting Angiosperms over wind-pollinated, spired Conifers. There is no predictive value to evolutionary history for the evolutionary future. Just because we dominate the Earth today does not mean that in changed conditions Collembolans may not gnaw our bones, but it can tell us where we have come from and what are likely to be the natural ways of life for our kind.

### SECTION 3: The Free-range Girl

Annie wrote:

*> If some strange woman "claiming to be a journalist" approaches my kids in the mall when they are hanging out with friends, I EXPECT them to walk away. Maybe I'll feel more comfortable having them talk to strangers when they are 16 or 17, but all I could think reading about the kids walking off or giving the reporter the cold shoulder was "Good for you!".*

\* but if they were home-schooled kids you'd expect them to be civil, and to engage the enquirer in intelligent conversation before deciding to shun her. This wasn't a single infant being approached by a dangerous stranger, but a group of young adults who quite outnumbered the stranger.

Certainly the journalist's approach was crude, but that wouldn't elicit a rude response from home scholars. Say she had approached the 'free-range girls' (Heather Scott, Alex Holden, and Jennie Schueler) of the OHLA: they would have calmed her down, explicated the profundity of her complexification, enlightened her, and sent her on her way.

The thing I found interesting about the coverage of this study was the lack of emphasis on the importance of age-segregated schooling in causing age-segregated social relations.

fred.

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The notion of the "free-range girl" is based on a study which Prof. Google can't find but was reported on 'As it Happens': the growth of girls but not of boys was stunted by social stress during adolescence. In the absence of this reference, we rely on anecdotal accounts by teenage girls whose growth spurt was stopped in the early years of high school, and the growth to apparent genetic potential of the unschooled girls from supportive families referenced above.

### Section 4: Unschooling

Unschooling is the 'free-range' theory of family life: learning grows out of day-to-day situations, scholars have a free choice of what and when to study, no work is done to be wasted, and there is

no evaluation for the sake of evaluation. Implemented on an institutional scale, unschooling becomes a Sudbury Valley School.

For an unschooler, the only the only way to assess the Ontario shibboleth of “satisfactory instruction” is to simply ask the student. “Judge not, that ye be not judged....” As parents we may be able to observe evidence of satisfaction, but we give away a lot of our position if we even let ourselves claim to judge it. Parents must maintain family order, and may sometimes have to assess unsatisfactory performance, but satisfaction is an internal mental state, and there isn’t anybody except the instructed student who can know when he is satisfied. “Satisfactory instruction” doesn’t even require that parents do anything or teach anything directly if the student is satisfied that he is learning appropriate material by himself. Making the formal judgement of “satisfactory instruction” may lead to salutary evaluations of the program by the student. Coming at it from the other side, would any reasonable teacher continue a course of instruction that the student described as “Unsatisfactory?”

Todd Pratum wrote:

*> It is hard for me to believe that Sudbury people leave the choice of TV up to the kid, say it isn't so!*

\* democracy is like that. Television withers away in unschooling households, so why should it become a problem in a mass unschooling environment like a Sudbury School?

*> Both Mander and Postman make it clear that children under the age of 9-10 cannot, in general, think critically and are therefore unable to fend off the tricks used by thousands of highly paid psychologists who work for children's departments in advertising agencies.*

\* my personal theory is that there shouldn't be any television in households that include children under the age of 12, so if younger children want to watch TV they can visit with elderly or mass-cultured neighbours. But I doubt if unschooled children are unable to fend off the tricks used by highly paid psychologists, especially if a grandparental figure is providing commentary.  
-- fred.

## SECTION 5: Cross-fostering, or apprenticing, or sleep-overs, or stay-at-home-schooling?

citation: Schueler, Frederick W., and Aleta Karstad. 2004. *Cross-fostering, or apprenticing, or sleep-overs, or stay-at-home-schooling?* Home Rules 9(3):7-8.

The past year has seen a number of triumphs in public recognition of home-schooling - articles in Reader’s Digest and big studies of socialization and academic achievement - so maybe it’s

time to consider whether teaching parents in Ontario are living up to their ideals and true potential, and ask if there may be gaps in home-schooling as currently practised.

One of the questions is whether we're home-schooling to launch our kids more successfully into a professionalized conventional world of training and certification, or whether we're unschooling for life, envisioning an amateur family-like love-based community of vocations and scholarship. Does home-schooling just skip young kids past the often-traumatic early grades, or is it building up an alternative system of personal-contact, certification-free education, experience, and life?

In 1984, when we met John Holt and Donna Richoux, and realized that what we'd been doing was home-schooling, one of the things we assumed would be characteristic of the home-schooling community was cross-fostering: **children living in non-parental home-schooling households for extended periods in order to learn what the other household had to teach**. We knew that such apprenticing had been a predominant mode of education before the advent of compulsory schooling, and that Margaret Mead had found it to be frequent in Tahiti in the 1920's - where children drifted among households depending on who they were getting along with or not-getting-along-with at any particular time, or to learn particular skills from members of non-parental households.

The basis of cross-fostering lies in basic population genetics: half the genetic variability in a freely inter-breeding population will be expressed in the offspring of a single couple, so children are likely to have strikingly different talents from their parents. This means that they're likely to benefit from apprenticing with a family where their interests are practised. In the mentoring household the apprentice can help with the work and rapidly learn what's involved, without the family politics that are often involved when working at home.

As home-schoolers, we accordingly opened our home and our work to apprentices and visitors. We advertised in **Growing Without Schooling**, in the **Mentor Apprentice Exchange**, and at OFTP & other conferences, sent out invitations over e-mail lists, and hung <http://pinicola.ca/apprent.htm> on our website (of course, with Catch-22 in effect, we're so busy with home and work that we haven't had time for enough publicity to confirm we've reached the population who might be interested). Over the years we've had 9 apprentices, with various degrees of success, and our daughters have constantly sought to loan themselves out to other home-schooling households. *Only two of the apprentices have been home scholars* (none since 1987), and the daughters haven't been invited into other home-schooling households. Among home-schoolers, as among the classroom-bound, even a 'sleep-over' at another home is a big event.

In the early 1980s we and some other families founded a group in Kemptville that was called, at Aleta's suggestion, "*Parent to Parent*" which was to have been a mutual support group, with the meetings addressed by the members on aspects of parenting. There was a lot of mutual exchange of information during the organization of the group, but after it was formally launched no parent except Fred interrupted the parade of fire marshals and police chiefs and child psychologists and other professionalized 'experts' on the podium. We were led to conclude that valuing the knowledge of 'professionals' more highly than our own collective experience was a deeply ingrained behaviour, even among many of those who profess to suspect it. Is this the case with cross-fostering? Does the reluctance lie mostly with potential host households that don't see value in what they might teach potential visitors, or with suspicion of this among the parents of potential visitors?

So what's going on? Circulating a pre-draft of this article on the **[oftpchat]** e-mail list didn't reveal any great enthusiasm for away-from-home schooling, or any tales of home-scholars apprenticing with other families. On the one hand, it seems that a failure to cross-foster permeates the home-schooling movement in Ontario, and on the other hand it's clearly one of the best ways to make full use of the educational resources our homes represent, and to maximize the lateral transfer of understanding and learning within our own ranks. Costly international exchanges of high-school students are considered invaluable opportunities for experience, learning, and development of character & wisdom. The special skills and life stories of the parents and relatives of local home-schooling families can be equally enriching for our children if we would only look outside our own homes to where life happens - not just the commercial and institutional world out there, but the experience of other families.

The alternative, and less philosophical, explanation seems to be 'lessons,' and several from the **[oftpchat]** list told us that cross-fostering wouldn't be possible because it would interfere with lessons. One wonders if it's possible to teach anything particularly deep with lessons? Is it being assumed that home-scholars have interests rather than vocations? Or is this sadly true? Certainly you can't teach a vocation like *Impeccable Herpetological Commando* or journalism or farming with lessons! It's important to immerse an apprentice in a craft or practice because it is a life to be lived, not just a set of skills to be shown by workshops and lessons. It seems that lots of young kids have a vocation to study nature, but if they're only given lessons, as if an 'interest' in nature were one thing among many, they'll never learn it. Either they'll try to re-invent the life skills of their passion (with many errors), from books or inference, or they'll drift off into some less interesting field. The schools and nature centres can't teach commitment to a vocation because they don't know of it.

In any event, we're still here, <http://pinicola.ca>, and if any home-scholars have a desire to help the living world persist through the present crisis of extinction and change, we can teach what we've learned about natural history art, documentation, conservation, and research in 30-something years of attempting these things across Canada and around home. This summer we've got an opening for an html-friendly apprentice to convert a book that we wrote and illustrated in 1984-1989 about the ecology of the glaciated part of North America into a CD-ROM. This project should be a great introduction to Canadian geography, Canadian natural history, museum methods, html coding, and digital image manipulation - a typical apprenticeship opportunity.

## Chapter 8: Politics

### SECTION 1: Interpersonal combat

**Rage.** When someone buys a car from you "as is" and then comes back and parks it in your driveway, demanding a safety inspection and their money back, rage is the natural reaction: feeling that they've stepped on you, you want to step on something else, and break it into such tiny pieces that it will no longer possess an individuality, so that the gap its destruction creates must be shrouded by a hanging towel. The problem here is that your rage is so great that the only objects worthy of fragmentation are those used or needed by yourself or other members of your family, so the destruction leads only to remorse, loss, and recriminations.

Even 20 minutes of serious axe-work could do substantial damage to the average residence, so the restraint exercised by previous generations of inhabitants, all doubtless provoked just as outrageously as you are, makes every residence an impressive monument to self-control. The protocol which allows the survival of residences down through successive generations is the assembly of chairs or other furniture into a pile proportionate to the experience of rage. This has the advantages over destruction that the piling requires some calming care, a disassembleable monument to the magnitude of your rage is left for returning family members to assess, and your commitment to the enterprise makes you feel like an idiot. You'd ultimately feel like an idiot, anyway, if you broke things into bits (cf the Avro Arrow, or chairs that could have contributed to the pile if you hadn't broken them), but this way nobody gets hurt, and everybody is spared the labour of repairing the broken objects.

**When is an argument a fight?** When you become enraged in the presence of someone somehow associated with the subject of your rage, a fight or argument is likely to ensue. It's doubtless an inhibiting circumscription of the human emotive range to always refrain from expressing the feelings of loathing and despair you entertain towards the actions committed or proposed by your loved ones. Often enough, your loved ones act as if they were blindly indifferent to their, your, and the planet's best interest. Unfortunately, they simultaneously realize that they have borne the brunt of a stiff struggle for planetary harmony, while cunningly making this sacrifice augment your (plural) collective interests, and, in fact, undertaking immense sacrifices to do the best for you (singular) personally.

That notorious 1968 volume, **Intimate Enemy: How to Fight Fair in Love and Marriage** by George Robert Bach & Peter Wyden, aka "The Fight Book," provides protocols for avoiding bloodshed and sleeping-on-the-couch in these circumstances. Karen Ross is said to have fooped off into history under another name after affirming that *"anybody could live together by following that."* The main lessons are to stick to resolvable issues ("don't throw in the kitchen sink"), and not to fight in stressful circumstances, but the fight book should be consulted for a full account. "A Reader" reports on the Amazon.com *"I read this book many years ago and it totally changed my perspective about the NEED for conflict in a relationship. It pointed out constructive ways to express one's feelings and opinions without becoming destructive and hurtful in the process. The author points out that positive conflict-resolution techniques are*

*essential if relationships are to last in the long term. The concepts not only changed the way I deal with family and friends, but also gave me some excellent techniques for dealing with students, parents and colleagues in my teaching career. I long since misplaced (or loaned out) my copy of this book, but would like to find another.”*

It's an open question whether love, as “a relationship in which arguments are compassionately decided on their merits, without prejudice arising from which participant suggested the ultimately prevailing notion, and without a long-term tally of which participant's notions have prevailed more frequently” results from or is preserved by the implementation of these protocols.

**Packing.** Often your loved one will undertake a project – such as marrying you or packing for a summer in Tobermory – with such a totally unnecessary intensity and dedication to detail that you are raised to an incandescent internal condition. This must find an outlet, or numerous arterioles will rupture from excessive systolic pressure, leaving you with an unsightly blotchy appearance, and an onset of kidney failure. To prevent this, you must find some outlet, or, as the ethologists call it, a “displacement behaviour.” Attempts to emulate the cry of the enraged African Elephant may lead to ruptured ear drums and strained ear ligaments. The pant-hoot of the Chimpanzee is a closer phylogenetic approximation, and can be accompanied by quadrupedal hopping about on furniture, and the waving of broken-off branches or other artifacts. While neither of these strategies will actually divert the attention of a loved one who is deep into a project, they may slow down the process, and certainly won't do anything to shorten it. Like the speed of light (but much slower) progress on a project proceeds at a set speed (720 details/hr), which cannot be changed by outside forces.

Accordingly, the best strategy for a project is to move around it like a satellite on an elongate orbit, periodically asking if there's some way of helping which you can both understand and accomplish, and then swinging out to the distant regions of the real world, and accomplishing some task of gardening, invasive alien suppression, or literature as a displacement activity. Many important contributions to knowledge originated in this way, and many a Buckthorn has felt the bitter bite of the brushaxe because a spouse insisted that a particular sequence of details calls be completed before a departure.

## SECTION 2: Community

*this section is not available for the beta edition of this book*

## SECTION 3: Political action

**CBC.ca:** “British Prime Minister Gordon Brown, responding to a shooting that he said has 'shocked the whole nation,' met Thursday with police officials to discuss ways to curb violent youth crime. Violence among young Britons is most often centred in bleak neighbourhoods with high unemployment.”

...but one knows for sure that any such action won't do anything to solve the problem of dys-

familial and dys-social non-naturalist youths. Things like this lead one to define government as *"treating the symptoms rather than the disease,"* and to think that there's little point in struggling to bring ecocentric or other sensible ideals to the attention of its Leviathan. Many people so recoil from the fray that they refuse to join any community organizations.

We may be sure that the primary responsibility of government should be the relationship between People and their non-human neighbours, and this assurance can seriously impede interaction with government personnel, since a single admission of your real feelings about an issue can alienate the agencies or individuals you're trying to work with: *"When I protested that the Official Plan seemed to be combine Third World rates of population growth and First World levels of personal income, the mayor snapped that 'You can't stop growth,' and subsequently ignored all our attempts to moderate the ecological severity of the Plan."* Yet stopping growth is the name of the game, and the main duty of humanity in the coming century!

*"Our belief that the general recognition of human overpopulation, about the time of World War II, should have ended all encroachment on relatively undisturbed habitat, and that the human footprint should have been retracted as the human population fell, disqualifies us to comment on the anachronistic desire of commercial People and governments to destroy habitats, but we're glad to work with those who are able to engage the system of 'evaluating' the undesirability of such destruction, or of moderating its effects when it does occur."* (<http://pinicola.ca/emyd.htm>)

The trick, for the ecocentric, is to work as a resource or far outlier of community groups such as LFAC, SaveOurGreenSpace, and CReD, pushing democratic ideas (never assume they're endorsed, despite official platituding) and ecocentric ideals, always remembering that "some People don't even know that Plants are alive," but engaging the commercial mindset to the extent that this is possible.

Federal and provincial governments tend to be relatively sensible and vulnerable to fact and situation, but municipal governments seem to be bought up by habitat destruction wonks ("developers") from the moneyed underclass, and to actively resist attempts to make them act reasonably. This makes it mandatory for citizens to band together and pressure their municipalities, and also to run for election to council (though in local races reasonable people have a dismal record at the polls, suggesting that the commercial culture is as widespread as it makes itself to be).

It has been suggested that the most effective tactic might be to silently attend every municipal council meeting, as a "green caucus" and report on the ecological implications of each action in a blog or letters to the editor of a newspaper. This would build up a body of analysis, which might trigger widespread understanding, but which wouldn't involve a lot of conflict.

**<<insert account of Joe Jordan's conversion to sustainability, and gradual erosion of this from his platform -- Jennie's letter to Cross Country Checkup>>**

an attempt at communication with a municipal government:

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30 Main Street,  
Bishops Mills,  
RR#2 Oxford Station,  
Ontario K0G 1T0

30 January 2007

The City of Ottawa  
Transit Committee

Dear Committee:

It is my understanding that you are discussing replacing the plan for a LRT line through the relatively undisturbed area east of the Airport Parkway, between Hunt Club and Leirtrim Roads, with one for a transitway, or road dedicated to buses.

As you may know, in 1967 R. H. MacArthur and E. O. Wilson started a revolution in ecology with their *Theory of Island Biogeography*. This theory successfully modeled the number of species found on islands as an equilibrium between colonization and extinction, with the number of species increasing with both island size and proximity to the mainland, or source of immigrants. Through the decades since, this theory led to important progress in conservation biology, as patches of natural habitat were modeled as islands in a sea of disturbed habitat.

Professors Gray Merriam, Scott Findlay, and Lenore Fahrig, and their students, in Ottawa's universities, have contributed substantially to the development of this theory into the field of Landscape Ecology. A fundamental conclusion of their work is that the preservation of biodiversity requires corridors of inhabitable habitat between large habitat patches, and minimal fragmentation of the habitat patches by barriers to dispersal and migration. Roads are the classic example of such barriers, because they completely sever the habitat on either side, and because they are much "wider than they appear" due to the direct mortality they impose on migrants.

If you look at an aerial photograph of Ottawa, the woods and wetlands east of Uplands Airport stand out as relatively free from fragmenting roads and other linear features. In the western extremity of this area, between Lester and Hunt Club roads, which we surveyed this summer,

several old roads and tracks have been abandoned, reducing previous fragmentation. This is “a very diverse mosaic of contiguous habitats: shrub swamps that would be plausible habitat for the Blanding's Turtles; vernal ponds extending into swamps, low woods dominated by alien Earthworms, sandy woods with a relatively intact flora, the open Monarch Butterfly fields in the centre of the area, grassy tracksides that support populations of the large native land snail *Neohelix albolabris*, the non-freezing North Pond, and woods south of there with large trees, but an understory made up of forest edge herbs.” As you may know, a road-killed juvenile of the “threatened” Blanding's Turtle was among 13 road-killed Turtles picked up along Lester Road by us and Save our Green Space in 2006. see <http://pinicola.ca/emyd.htm>.

That Blanding's Turtles have survived here strongly suggests that they have accommodated their movements to the present level of fragmentation in their habitat, which means they have minimized the occasions when they need to cross roads, though the number of road-kills found along Lester Road shows that they have needed to cross the road there.

The infrequently used rail line that bisects this area constitutes a complete barrier to the movement of some small animals such as the *Neohelix* mentioned above, and must very substantially impede the movement of Turtles, though without actually killing them. If it were used by, or widened into an LRT line or a transitway it would become a much more serious barrier to Turtles: either a complete barrier if fenced off, or a catastrophic source of mortality if not fenced. Even without the effects of the barrier or mortality, widening the existing single rail line to the full width of the right-of-way would destroy 4% or more of the wetland north of Lester Road, and the noise and ground vibrations of heavy bus or train traffic might drive the Turtles out of much of the rest of the wetland. “Deciding” which portion of the wetland is important to the Turtles, and destroying the rest of it, would, obviously, very likely eliminate the population.

I don't know if Ottawa's present council is really interested in maintaining or augmenting the wonderful biological diversity that is its legacy. Certainly it has been said, and widely believed, that “***The City of Ottawa has an abysmal record when it comes to wildlife and plants... period.***” If the present Council is interested in reversing this reputation, it could do nothing better than to use the “threatened” status of the Blanding's Turtle as a justification for minimizing habitat fragmentation east of Uplands Airport, and ameliorating the mortality now occurring at Lester Road.

If I can be of any further service in your discussions of this area, do not hesitate to contact me.

Sincerely,

<signed>

Frederick W. Schueler, Ph.D.  
Research Curator

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## SECTION 4: Unprocessed Convention notes on prophesy

*"our strength is commanded, and it's commanded by the LORD"* -- but we know that command unchecked by democracy always leads to disaster, so a reliable God must be a constitutional monarch who takes the advice of His Parliament of Prayer, and the Wikipedia of His Spirit. Both Convention and Prof. Dawkins are united in a point-like singular CPU model of God, while we know from His works that the internet is a better model (incorporating, indeed, the pornography of fundamentalism, and the entertainment of iconodulism, along with the still small voice of Truthout.org).

The repeated calls for purely personal Christianity (*"There are so many things we can do before God privately and secretly..."*) brings the realization that we hear no prophets: No Mike Rankins or Ron Brooks or James Gibbs or Michelle St-Cyrs making a call for sustainable public policy or fruitful interaction with other species. You can't prophesy in private, and recruiting to a privatistic practice isn't prophesy! Christian insistence on the equal worth of each soul having given rise to democracies, we are all, or ought to be, both Hezakhiahs and Isaiahs. In a democracy there is no private life and no private morality - everything we do, say, or buy is a public declaration of our beliefs.

*"David is always a favourite of mine."* Why is David such a favourite, and why is Amos so consistently shunned? The documentation is about equally good: the Early Source of Samuel is the oldest known document that was written as history, and the Book of Amos is the oldest substantially intact transcription of Yahweh's word. After Convention, I had to read Amos all the way through to clear my mind, and I think the answer is that, through Amos, God just says: "Do what's right, or else suffer the consequences." There's no reference to individual salvation experiences, just the drumbeat of a repeated call to do what the hearer already knows is right for those whom wrong-doing has abused and for the land. David, on the other hand, is an angst-ridden figure heroically figuring out how to personally do what's right in trying circumstances, knowing God as a culturally supported ambiguous but convincing inspiration, but not as the unambiguous voice that spoke to Samuel. As a king he's no Alfred the Great, however, and by fitting into pre-established patterns of post-bicameral kingship, he committed some of the sins Amos inveighs against. Oh to have the Book of Nathan!

It's interesting that speakers repeatedly refer to the difference between ancient times when kings ruled and subjects obeyed, with modern times when governments are democratic, but they never refer to democracy as a work of God -- in fact they seem embarrassed by it, as if they can't understand how something so useful has been achieved outside their *modus operandi*, or are worried that it somehow gets in the way of the direct implementation of the first century polity.

Why not acknowledge the democratic character of the Parliament of Prayer and the Wikipedia of the Spirit? ...heroic in its avoidance of discussing alternative hypotheses: neotenic origin of humanity, implying that child-likeness is the natural human nature; contrast between 'human person' (aboriginal, unschooling) and 'larval human' (curriculum-bound or slavery) models of childhood -- and *determining what the children Jesus would have encountered in Galilee*

**would have been like**, This is critical: Is God an unschooling parent or a control freak? (certainly many of his 'followers' have freaked out in control of their children).

To ramble on: the child needs to obey, but is this taught by control or by example? We've got a cascade of hypotheses here -- mostly endorsed by commercial/curriculum/religious culture but contradicted by unschooling -- so why not address the contradictions? is Christianity a revival of aboriginal ways, or of monarchial control?

I've previously suggested that the awaited second coming was the triumph of the Darwinian method (story-sacrificing hypothetico-deductive science), and this year further possibilities along these lines came to me: all based on the idea that God is on the ball, working with his clumsy suffering-servant methods (the worst there have ever been, except for all the others that have been tried...) towards a progress.

Maybe 'Roberts Rules of Order' are a divine incarnation for situations where there are radically opposing points of view: certainly they have often delivered the fairminded from the hands of their enemies. The Ark of the Covenant is a constitution, and the Rule of Law gives us the tools to deal gently with jerks and creeps (sinners) — if we use them.

Are the white-clad swarms of voters in the Revelation to John participants in a universal-suffrage democracy? To what extent may *vox populi*, despite all its flaws, really be *vox Dei*? Certainly democracies have stabled the apocalyptic Horsemen: they do not fight wars among themselves, they deploy food or money with a promptness that prevents famine, their public health departments have eliminated infective pestilence (all of which infuriate voters before they inconvenience them) and the religious freedom required to maintain civic tranquillity does away with persecution of God's people, whichever these may be!

Do you need (as the Puritans claimed) a monarchial God in order to be democratic, or is democracy (the suffering servant) a strong enough story to support itself all the way up? And is the monarchial god of a democratic Church properly regarded as a **constitutional** monarch, Mr Speaker? Locusts were dumped on for "*going forth in bands without a king*" and it was inferred that "*If there was more than one Shepherd they wouldn't agree?*" Why not? Don't the Workers and Saints manage okay? Maybe God's kingdom is an alternative government, like the Council of the Haida Nation, stepping in to do what's right when that is being ignored. In any event there was no open statement of a hunter-gatherer or suffering-servant metaphor except for subtle hints in the testimonies of some of the deepest thinkers among the Saints.

## Chapter 9: Advanced Apomorphies

The ability to hold a wedding ceremony isn't a particularly human development, since Grebes consummate their unions by gifts of weeds, and Cormorants announce theirs with sticks. The sections that follow emphasise the verbal and ritual apomorphies, and the human responsibility to document our doings if we're to understand them, but they neglect the artificial competition of sports and games. Watching sports played by teams of strangers may well be regarded as a wasteful activity, or false religion, since no benefit can be seen to flow from it, and -- A three-year study published in 1995 by researchers at Northwestern University found that while male student-athletes are 3 percent of the population, they represent 19 percent of sexual assault perpetrators and 35 percent of domestic violence perpetrators. Sandra Kobrin, Women's eNews, Tuesday 21 August 2007 [http://www.truthout.org/issues\\_06/082207WA.shtml](http://www.truthout.org/issues_06/082207WA.shtml)

### Section 1: Song

“Spoken language is a result of the human capacity to assemble simple vocal units into more complex utterances, the basic carriers of semantic information. Not much is known about the evolutionary origins of this behaviour. The vocal abilities of non-human primates are relatively unimpressive in comparison, with gibbon songs being a rare exception. These apes assemble a repertoire of call notes into elaborate songs, which function to repel conspecific intruders, advertise pair bonds, attract mates [, and] to protect themselves against predation... In most gibbon species, the mated pair normally sings in the morning in a coordinated fashion, the so-called duet song, most likely to communicate to neighbouring individuals.” Clarke E, Reichard UH, Zuberbühler K (2006) *The Syntax and Meaning of Wild Gibbon Songs*. PLoS ONE 1(1): e73. doi:10.1371/journal.pone.0000073.

Gandalf ran over songs of lore in his mind as Shadowfax bore him and Pippin towards Minas Tirith, and the Mary Ellen Carter contains complete instructions on how to raise a sunken fishing boat. (“...on a barge lent by a friend. Three dives a day in a hard hat suit and twice I’ve had the bends. Thank God it’s only sixty feet and the currents her are slow or I’d never have the strength to go below. But we’ve patched her rents, and stopped her vents, dogged hatch and porthole down, put cables to her ‘for and aft and girded her around . And tomorrow, noon, we hit the air and then take up the strain, and watch the Mary Ellen Carter rise again.”)

Memories of every history are prompted by song, and every family should accrete a series of of songs of lore and history as memorable events unfold, and surely every individual should accumulate songs elicited by encounters with totemic species.

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**Oh to be *Acer negundo*,  
Sprung from every vacant space,  
Oh to fold each grateful household  
Softly in a green embrace.**

(Limerick Forest, 12 July 2005)

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## Section 2: Poetry

here's a proposed afterword for a book of poetry, in place of a full thory of poetry itself, which I don't have time to compose now:

11 January 1990

Editor Sir:

Since letters to the *Queen Charlottes Observer* in recent months have included many attempts to reconcile various local cultures to each other and to the land and other species, it may be of interest to sketch a quick hypothetical intellectual history of mankind, and then attempt to reconcile it with what we see around us. The processes I describe as a simple progression have gone on as a complex tangle of thoughts and practices, present in different levels in each individual in each culture, but perhaps there will be some virtue in the proposed scheme of simplification.

First, People learned to talk to each other, and found that they could influence each other's behaviour by persuasive speech. Given this success, it was natural to try to influence other species and the physical environment by speaking to these individuals, populations, species, and forces. This is the idea of magic, the use of human speech to control or communicate with individuals or forces that do not speak the same tongue. Songs were sung to runs of Salmon, thanking them for their return, and assuring them that their flesh would be used reverently, so that their souls might return in new bodies in another season.

Because of the nonverbal content of much communication, the success of magic in influencing People, its effects on the speaker, and perhaps a group selection which favoured communities that used such speech to regulate their exploitation of nonhuman populations, this magic continued in many human communities until the spread of modern commercial culture suppressed it in the nineteenth and twentieth centuries. The importance of believing magic, lore, myths, and other unverifiable stories so facilitated social functioning during the emergence and history of our species as to in turn influence the character of People, that human personalities are largely formed around belief in such unverifiable stories.

To those who can speak only other People it may seem paradoxical that People in non-commercial cultures address individuals of other species as they are killing them for food, but no more paradoxical than it seems to them that Modern Commercial People exploit populations that they know to be finite with techniques that they know will exterminate their prey. Modern Commercial People may still address nonhuman prey in exceptional cases, but they do not

fundamentally believe that their speech has any effect. Is it as important for a herpetologist to say to a salamander "*Come along to the National Collection,*" as it was for Fraser Valley basket makers to assure a tree that they would not waste any of its roots?

Whatever the social utility of magic, it proved not to be literally true. This was discovered gradually, but while the social utility of magic speech was recognized the mechanisms of this utility were not. In order to preserve the social order produced by magic speech, while hedging on its literal ineffectiveness, speech and songs were directed to increasingly abstract entities, which eventually coalesced into a single Deity, the object of conventional religion. Prayers addressed to an abstract Deity requested that Salmon be presented to the petitioner, rather than that the Salmon present themselves. This had the effect of reducing human respect for prey species, and probably of increasing human pressure on wild populations.

Finally it was realized that no magical speech had any effect beyond that it had on other People, but that People could tell stories among themselves about physical means of accomplishing the ends which magic had sought. These stories, known as technology, were increasingly stolen from science, and, combined with the abstraction of value onto a single monetary scale, led to the rapid extinction of many populations of stream-breeding fish.

Science had started as an attempt to trace the mind of the Deity, but as it sacrificed its never-quite-true stories to the World, it found no trace of divine speech. When Lamarck gave way to Mendel and the ether to quantum physics, magic finally fell to craziness. It turned out that things are what they are, and they are not driven from within by any speech-like magic principle. Fish stocks depend, in a far-more-complex-than-density-dependent way, on the hatching, survival, growth, migration, escapement, and breeding of individual fish.

Now any worthwhile philosophy must be rooted in the scientific assumption that things are what they are, the world is as it appears to be, without any hidden agenda or intrinsically directed motive force. It follows from this that People and other life are the product of the only purpose-forming process known: natural selection. Natural selection produces direction, desire, purpose, self, voice, to the extent that these promote the reproductive success of individuals that possess them, and by the endless remultiplication of fortuitous variants which happen to produce greater reproductive success.

Any model of natural selection that is to be the basis of a philosophy must be understood as capable of producing the full range of observed behaviours and emotions. This is Darwin's reservation that if you are a product of natural selection, and you love your wife and are crazy about Orchids, then natural selection must be able to produce conjugal affection and Orchid fanatics. There is a stupid arrogance in the supposition that, just because you cannot specify a mathematical model for love, you should give up Orchids and beat your wife, but this has been a widespread reaction to Darwinism and other scientific stories.

Beyond that, an acceptable philosophy must include an ethics that describes life lived consciously within its model of a finite world formed by natural selection: a life split open and

wrapped around itself while still whole, like a face-jointed Haida grease bowl. Darwin was right about the fundamental difference between sexual and 'ordinary' natural selection. 'Ordinary' or somatic selection produces good non-reproductive engineering design, but such design is always more or less twisted by the demands of reproduction, because the survival of the individual is only the means to the end of reproduction. Salamander, spring-tail, fungus, Alder, are all as self-directed as the herpetologist, because self-direction is the product of natural selection. While some taxa support that self-direction with a more sophisticated consciousness than others, all lose equally on the dead-flat selective playing field when they die to feed the others.

Here is the mystery: the world is as sharp as the edge of a knife because the diet of each species consists entirely of the souls of others, but this individual selfishness leads only to reproductive self-sacrifice. Salmon swim the sea as perfectly designed silvery slashers, indifferently eating up the lives of smaller species, and evading predators. They do not grow up into any stable maturity, however, but at some arbitrary size and age that maximizes their contribution to a new generation — kokanee, grilse, jack, humpback, tye, or king — their bodies hump, jaws twist, they change silver for black, red, or green, and they run up streams where they cannot feed to use themselves up to the death to deposit, defend, or fertilize eggs of a next generation.

From an omniscience, the broad outlines of this story would make perfect sense as a means of stocking the seas with fish and moving marine nutrients into stream headwaters and forests, were it not for strange Darwinian wrinkles that always surround it, little weirdnesses that serve only to increase the offspring left by individuals, with no contribution to the functioning of the population. From the point of view of the Salmon themselves is it wonderful, incomprehensible, nothing, terrible, or beyond our knowledge? And if beyond our knowledge, certainly not beyond our wonder.

Whatever the culture that our children will need to survive on a planet that they will know they have the ability to over-use, it will certainly not be solely park-centred, urban-driven preservationism, landscape-wide rip-off exploitation, narrow-minded atavistic aboriginalism, or hard-nosed technocratic rationalism. Moderated elements of all of these will doubtless be necessary, and these elements already co-exist in the islands diversely denominated as the Canadian Galapagos, the Queen Charlottes, Haida Gwaii, and Management Unit 13 of Region 6. Writing and singing songs for the return of the souls of Salmon that are due to differential survival and reproductive success of individual fish that support a fishery and bring in tourist dollars, is a poetic experiment which has yet been scarcely tried, but our survival as a species may depend on it, and it has as much hope of success here as anyplace.

Frederick W. Schueler -- Bishops Mills

### Section 3: History

On the train to Moosonee, swaying north across the spartan but breath-taking Spruce-Heath-&-Sphagnum beauty of the muskeg, scanning the trackside trees for witches brooms that would indicate the presence of Dwarf Mistletoe, *Arceuthobium pusillum*, it came to me that: *the*

***naturalist's job is to love the whole world*** - with the corollary that ***we demonstrate that love by telling the truest and most detailed possible stories about the world.***

The underpinning of these earthly love stories, as Newton, Lyell, Wallace and Darwin taught us, is history, and history played out in geography. History is unexpected and complicated - billions of years of contingent accidents multiplied together into a fabric so complex that it is not only queerer than we know, but also queerer than we can imagine.

These creatures can't be classified by any simple scheme, because on Earth the quantum explosion of four-dimensional space-time is infinitely inter-reticulated with the innumerable twigs of the phylogenetic bush. In an historical universe, every population is both unique and representative. A scholar's job is to preserve those samples of the intersection of phylogeny and space-time that will be most useful in testing stories to best improve our understanding of both - to increase the number and truth of true stories.

That means exploration: because the first thing you learn about any group of organisms is that not enough is known about distribution and abundance and there aren't enough specimens or data to answer the interesting questions. Finish and publish the **Atlas of the Breeding Birds of Ontario**, (Cadman, Eagles, and Helleiner. 1987. University of Waterloo Press, Waterloo, Ontario. xx+617pp), take time to heave a single sigh of relief, and ***Bing!*** everything has changed. Ravens (*Corvus corax*) have moved into Grenville County, and Upland Sandpipers (*Bartramia longicauda*) have gone - and it's time to start reatlassing - and birds are the best-known taxon. Friends of Sowbugs (terrestrial Isopoda) atlas their distribution in Britain (<http://www.bmig.org.uk/>), but we don't even know what species occur in Ontario.

Given the lack of attention paid to so many aspects of natural history, everyplace is effectively unknown. Environmental change and advances in knowledge and interest constantly require re-exploration of every territory, and there are ever-increasing levels of spatial detail and environmental and biotic correlation at which every territory can be profitably explored. Henry David Thoreau 'travelled a good deal in Concord,' providing an unparalleled public record of its biota and making fundamental advances in ecology simply by constantly re-exploring his ancestral ground.

We've got to tell stories that emphasise the placing-in-context of the historical viewpoint: the depth of time, the phylogenetic patterns of relationship, the identities of homology, the authenticity of specimens, and the story-winnowing humility of scholarly epistemology.

As Stephen Jay Gould said of the Aurignacian artist who depicted the hump of the Giant Deer **“For simple items regulated by natural laws, we can often infer existence without actual observation. But for complex items of natural history, unrepeatable in their unique and detailed glory, and crucially dependent upon a contingent and unpredictable sequence of prior historical states, we cannot know their existence unless the paltry and grossly imperfect records of history leave direct evidence.”** 1998, *Leonardo's Mountain of Clams and the Diet of Worms*, p. 194

## Section 4: Celebrations

As a household we're blessed with a combination of the tradition of an anti-liturgical-calendar Christian sect and a poetic-naturalist background, so we've had to start from scratch to round out a natural liturgical calendar for eastern Ontario with place-dependent seasonal and a few calendric dates. Many of our rituals are rooted in the naturalist tradition of sacramental data acquisition -- particular events are recorded, both to celebrate them, to sacrifice favoured hypotheses to them, and to help bind all adherents into closer agreement by forging more generally acceptable stories.

Many of these natural sacraments are a kind of baptism, as naturalists are repeatedly soaked, and live in a constant state of readiness for immersion. Indifference (in person and equipment) to hydric state is at the core of the naturalist's willingness to participate in the world. People are water-squeamish terrestrial Primates, so stepping outside our prejudices for full participation in the world involves a lot of rejoicing in water, mud, and damp. This is also why we go out and paint landscapes at air temperatures of -20C. Similarly, many of a naturalist's sacramental events are nocturnal - to balance the human predilection for diurnal activity.

Here's a list of our primary rituals. Some of them are at the classic turning points of the year, but others are directed towards offsetting the idea that seasonal change is concentrated in spring and fall, since weariness of the seasons is characteristic only of those who carelessly neglect phenological events in high summer and winter: if you're attentive to a wide enough range of natural phenomena there's always some opportunity just coming up, or that you've just missed, because of the progression of the seasons, whether it's Cattails flowering in the week before Dominion Day, or Ravens going over in late October, or the movement of Mink Frogs to remote aquatic hibernacula after 13 October, or snow-surface Insects in late winter. **Many of the events can't be foreseen, and are only celebrated largely in the exhaustion induced by observing them.**

**Winter Solstice:** An indoors gathering, followed by a bonfire of the year's inflammable waste, and rich foods. This date is the natural New Year of the northern hemisphere, and is widely celebrated as an alternative to the commercialized and liturgized festivals of Xmas, Gregorian New Year's, and various other traditions. With dry waste material available, we celebrate it as the end of autumnal darkness, beginning of lengthening daylight, the local onset of the brightness of snow cover, and a transformation of waste into light (in the words of a couple of guys hauling a huge object out of the Queen Charlottes Hospital in 1989 "The things we throw away in Canada, eh?").

There's also reflection on the unwillingness of vegetation to burn at winter temperatures, and on the shallowness to which the soil is thawed beneath the heat: we may defy or evade Winter, but we'll never thaw it. We remind those who mistake this for a pagan ceremony that in ancient Europe the winter solstice was never marked by big outdoor fires - presumably because of the difficulty in assembling enough dry fuel at that damp, cold time of year (outdoor fires were the characteristic celebration of the summer solstice).

**Darwin's Day Phylum Feast** (12 February): a sacramental meal made up of as many taxa of organisms as possible (derived from Malcolm Telford's end-of-course celebration in invertebrate zoology at the University of Toronto), in remembrance of our relatedness to all taxa.

**Rushing the Woodcock:** This stands for all the 'first sighting' celebrations of spring: first Lark, first Redwing, first Robin, first calling Frog, *etc.*, because it's more active - and because in some years the male Woodcock endure weeks of privation before the soil finally thaws. At dawn, dusk, and clear full-moonlight, the males give a nasal dancing call - '*peenting*' - alternating with circling 100 metre-high wing-twittering display flights. Rushing the Woodcock is the art of dashing forward while the dancer is in ascending flight (and presumably can't see down from his dorsally situated eyes) and lying motionless while he is circling overhead or on the ground, trying to get close enough to see his strutting dance in some patch of moss or little clearing, but not spooking him to an alternative peenting ground. It's very much like certain aspects of combat, but with only 5% of the danger (when you throw yourself down on a sharp object) and only 75% of the mud.

**Auditory monitoring:** Through-the-night, across-the-region, March-to-August noting of the voices of the night both at home and along the 'more-than-one-person-can-handle' Kemptville to Brockville transect of 40 stations (4755 records currently in the database). This is a data-acquisition ritual undertaken to work out the seasons and times of calling, and possible population changes, of the local Anurans and night-calling Birds and Mammals.

**Eat Wild Herbs Day in Bishops Mills:** This is the day in early May when it has become possible to assemble salads from the lawn with no addition of store-bought or garden vegetables. It is celebrated by picking, dressing, and eating a sacramental salad which includes a maximal number of species, followed by a month of similar salads before the maturing vegetation becomes too tough and flavourful for easy human consumption.

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**Field notes of Frederick W. Schueler**

*Taraxacum officinale*. (Common Dandelion) abundant herb, in bloom, forage. FWS05May151830/a

Canada: Ontario: Grenville County: Oxford-on-Rideau: **Bishops Mills(Co Road 18/Mill St.intersection)**.  
MAP:31B/13, UTM 18TVE 446 688. 44.87246N 75.70096W

15 May 2005 TIME: 1830-1930ca. AIR TEMP: 18C, sunny, breezy

HABITAT: rural village, gardens, lawns, surrounding fields; a salad mostly from late-blooming tall plants around the Store. This was the traditional "Eat Wild Herbs in Bishops Mills Day" salad. Diversity has declined in the traditional foraging grounds around Pipers House and Weirs House - or else the unusual spring has brought things up in a staggered order. No Bumblebees seen or heard.

Other species in the salad

LIST: *Pinus sylvestris* (Scots Pine), young candles from trees in field by Miles;  
*Plantago major* (Broad-leaved Plantain), few glaucous leaves from behind Store - early foliage seem much different from summer leaves;

*Trifolium pratense* (Red Clover), from clumps along Co Road 18;  
*Glechoma hederacea* (Gill-over-the-ground), blooming near the Goatyard - plants are not as tall as in the past;  
*Dactylis glomerata* (Orchard Grass), around Transparent Apple tree - few thick stems left after harvesting for Rabbits;  
*Daucus carota* (Carrot), W of Store in gravel;  
*Oenothera biennis* (Yellow Evening Primrose), tops of plants from Pipers House Garden;  
*Asparagus officinalis* (Asparagus), 1 shoot from Pipers House Garden ;  
*Hemerocallis fulva* (Day Lily), bases of leaf bunches;  
*Allium schoenoprasum* (Chives), sparse clumps near Pipers House;  
*Allium tuberosum* (Garlic Chives), rampant on Store's Septic Tumulus;  
*Allium cepa*, growing really well this year in Pipers House Garden ;  
*Rheum rhaponticum* (Rhubarb), Pipers House Garden ;  
*Mentha spicata* (Spearmint), along Store's Septic Tumulus;  
*Viola odorata* (Sweet Violet), Store & Goatyard;  
*Viola pubescens* (Yellow Violet), back garden behind Store;  
*Lunaria annua* (Honesty), Goatyard - several days in bloom;  
*Neptha cataria* (Catnip), Pipers House Garden - not very tall yet;  
*Rumex crispus* (Curled Dock), centres from several plants;  
*Chrysanthemum leucanthemum* (Ox-eye Daisy), behind Store;  
*Arctium minus* (Common Burdock), behind Store;  
*Achillea millefolium* (Yarrow), from field by Miles - plants around Pipers House & the one beside the Goatyard seem to be gone;  
*Fragaria virginiana* (Strawberry), behind Store where it's rampant;  
*Tragopogon pratensis* (Yellow Goat's-beard), behind Store;  
*Chenopodium album* (Lambsquarters), seedlings from box beds at Store;  
*Chenopodium bonus-henricus* (Good King Henry), a few leaves from Pipers House Garden ;  
*Atriplex hastata* (Orach), seedlings from box beds at Store;  
*Malva neglecta* (Cheeses), Pipers House Garden - a few leaves from one plant;  
*Barbarea vulgaris* (Winter Cress), Pipers House Garden - trace amounts from a few plants;  
*Symphytum officinale* (Comfrey), one leaf from Pipers House Garden .

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**Determined by:** F.W.Schueler; **Site accuracy:** 400m village; **Coordinates from:** map reference location, datum UTM NAD 27 Canada & Lat-long WGS 84; **EOBase entry:** FWSOBS FWS/2005May15/1943:16; **source:** FWS/biography/as entered/EOBase; **record last modified:** FWS/2005May18/1411:57.

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Bishops Mills Natural History Centre

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**Turtle Nesting Season:** (traditional date in Bishops Mills - late May, early June) This is the tragic celebration of female reproductive investment and peril - memorialized by recording data, time, and location, helping the wandering mothers across roads, and observing the deposition of eggs.

**Summer Solstice:** An all night vigil, feeding Mosquitos, monitoring calling frogs, and recording the exact timing of the beginning of the avian dawn chorus; derived from the 'long dance' of Ursula Le Guin's Earthsea books. "*At 03:53 the Milky Way is gone from the southwest sky, and after a few preliminary calls, the first Robin sings, followed within 20 seconds by a Song Sparrow, a Chipping Sparrow, and a couple of Phoebes. By 03:55 Robins and Phoebes are singing from several directions, and the Frogs are beginning to be swamped by the onset of the*

*Birds. By 04:09 the dawn chorus is in full swing, with Bull Frogs still clearly audible behind it, but the Mink Frogs, while still chorusing as loudly as ever, are nearly lost behind the Robin 'noise.' At 04:18 Polaris is still visible, but by 04:20 it is overwhelmed as the dawn crawls up the sky."*

**Flowering of *Typha*:** (traditional date in Bishops Mills - the week before 1 July) A mid-summer celebration of male reproductive excess - as the about-to-open pistillate flowerheads are gathered for food, and the celebrants are dusted with the golden pollen of those that have opened.

**First Cicada call:** (traditional date in Bishops Mills - late July) An onset of high summer, celebrating the conversion of photosynthate to Animal life, larval metamorphosis, and the bacterial symbiosis which allows the Homoptera to live on plant sap.

**Arrival of the first juvenile Leopard Frog:** (traditional date in Bishops Mills - 1 August) Another onset of high summer, celebrating the landscape connections on which *Rana pipiens* depends for survival, traditional routes between a breeding and observation site, and the successful emergence of a new post-metamorphic generation. Herbivorous garden Insects usually decrease after this arrival.

**Burn Henry Ford in Effigy Night:** this festival was discovered on County Road 18, south of Kemptville, on 14 Oct 2000, and corresponds to the macabre holiday of store-boughten orange & black geegaws celebrated by calendar-bound traditions. It is a festival of revulsion and disgust at the slaughter automotive transportation imposes on the populations of any Animal that needs to move across the landscape; and occurs on the night when the greatest numbers of dead and not-yet-dead Leopard Frogs are seen at the locally traditional killing fields. Celebrated by recording the slaughter, though additional rituals such as the old Spencerville tradition of setting piles of tires alight in intersections may be appropriate.

**Mudpuppy Night in Oxford Mills:** This is an all-winter-long celebration of cold-blooded adaptation to activity through the winter, and of the particular conditions which makes it possible to directly observe this activity at Oxford Mills.

Below the dam in January, on the bedrock floor,  
At first you just see one, and then there's more and more and more,  
Stepping with their little feet and stubby fingers four,  
They fan red gills and flex broad tails beside the spillway's roar.  
*Necturus maculosus - they prowl the winter nights.*  
*The tadpole is their snack food, the Crayfish their delight.*  
*When Oxford Mills, incurious, has tucked itself in tight,*  
*They wander, cleaning up the creek, beneath the shelves of ice.*

*include thanksgiving for not being in the economy -- tell and write history -- live to make things easy for your biographers*