

The **geocup**[®] story

A Paper Cup Evolution from Roadside Litter to Big Picture Package.

When the connection between producer and consumer is obscured or absent, observed economist E.F. Schumacher, it creates an economic system that is dissociative: *people know the price of everything and the true cost of nothing*. It has been to the advantage of the producer up to now, continues Schumacher, to perpetuate this disconnection by maximizing only its financial and manufactured capital while marginalizing its human and natural capital.¹ Nowhere is this disconnection more evident than between coffee drinkers and "technified" coffee plantations—growing sun-tolerant coffee on clear-cut land with heavy chemical inputs. It is our tragic story, notes geologist Thomas Berry, of basing the entire functioning of the human community on a biologically disruptive economy.² Of the 11.5 million hectares of coffee planted worldwide, a small, yet growing percentage of coffee growers are returning to traditional farming methods that are self-supporting—growing shade coffee beneath a variety of tree species and few unnatural inputs. In Nicaragua, for example, 95% of coffee production is grown under existing tree canopy.³ These specialty coffees are known variously as organic, fairly-traded and shade-grown coffees.



But it is the final link in the "value chain" from coffee grower to coffee drinker that is the weakest: the bright white synthetic cup to-go that litters our landscape. **Geocup**, a big picture package, is the missing link. "**Geo**" is Greek for the Earth and **Geocup** represents a new relationship with the goods and services that Earth provides us. **Geocup** directly connects the specialty coffee market to the caring customer. It is about Earth-friendly fibers and non-toxic chemistry and acknowledging the true costs of production. It's about telling the ecological truth.

Although world coffee production hit an all-time high in 2000 (7.1 million tons), thirteen of the world's twenty-five biodiversity hot spots—those areas that are unusually rich in species and highly threatened—are major coffee producers.⁴ Traditionally, coffee is grown in the shade of fruitful tree habitat. Since the 1970's, these traditional shade varieties have been slowly replaced by high-yielding dwarf varieties that require more chemicals and sunlight. Technified coffee plantations cultivate these sun-tolerant hybrids on a massive scale, which allows profit through volume. Sun coffee is synonymous with deforestation and is the leading pesticide-intensive crop of any that we eat or drink.⁵ Continued expansion of the industrial farming model over the next few decades, warns ecologist David Tilman, has the potential to have massive, irreversible environmental impacts. To communities that surround these "tech farms", resulting habitat loss and chemical run-offs are devastating; to economists they are called "externalities"—because they are not included in the production costs and hence are absent from the price. Today, value-driven companies like Equal Exchange Coffee, Taylor Maid Farms and Merchants of Green Coffee⁶ offer sustainable coffees at a price that reflect *all* the factors of production: financial, manufactured, human and natural capital. These companies recognize that a new and savvy sub-culture of caring customers is emerging: the global citizen. A great shift in worldview—that *the human economy can only exist as a subset of the Earth's economy*—is reverberating throughout this market segment's buying practices. In 1999, for example, the global market for natural, organic and health food products was \$65 billion—of which 36% was consumed in the United States, plus 31% in Europe, and 16% in Japan.⁷

In this context of emerging customer awareness, a paper cup evolution is taking place. **Geocup**, a single-use paper cup, is challenging the persistent white coffee cup that litters our landscape. The sleek, bright white cup—of virgin plastic foam or bleached forest fiber—is a creature of an economic system that increases profits by "cost externalization"—pricing that reflects a product's financial and production

costs, yet ignores its social and environmental costs. This "under-priced" cup is appropriate for technified coffees—a.k.a. "the cans"—that offer a "consistent taste profile." But for robust, specialty coffees (organic, shade-grown, and fairly-traded), the right-priced cup is **Geocup**: an innovative paper cup to-go shaped by optimal resource use, non-toxic chemistry and organic design. **Geocup**'s design goals are three-fold: to align its price with the true costs of production; to be "100% decomposable"; and to share information and spread awareness about a sustainable eco-economy. "Packages serve as symbols both of their contents and of a way of life," notes Thomas Hine.⁸ Sipping specialty coffee from a **Geocup** is not going to save the world. It is a choice for responsible and frugal consumption of our global commons.



Big Idea No. 1: To be ethically justified, anything produced and sold must be more simple in composition and benign in chemistry than what it replaces.

What is Geocup?



Geocup is an innovative, single-use paper cup system for hot drinks to-go. The premier version, **Geocup1**, is an alternative fiber cup, optimally insulated by dual "cool zones" and topped by a lid that offers a convenient "wheel of drink ports" that fits all cup sizes—12, 16 & 20 ounces. **Geocup**'s price will not only reflect all four production costs (financial, environmental, machine and labor), it will be competitive with those cup systems that continue to ignore the true costs of production.⁹ Another version under development, **Geocup2**, will be available with our innovative tripod paper lid.¹⁰

Geocup's mission is to "substitute quality and innovation for mass."¹¹ In other words, each version of **Geocup** will strive to provide better service using less: less high-impact fiber; less toxic chemicals and inks; and less of anything that doesn't break down into benign stuff. For example, **Geocup** reduces its fiber use overall by focusing the cup's strength and insulation at two, palm-sized paper strips fixed opposite on the cup's sidewall. **Geocup**'s high standard of design assures exceptional comfort, safety and convenience. Its plastic lid, for example, provides manual drink ports—each with an internal backslash—for better control of the hot beverage.

As **Geocup** evolves it will challenge how cups are made, what they are made from, and what they come to symbolize. **Geocup** is the first decomposable (formerly disposable) cup that looks at the big picture. It is a design approach that poet-farmer Wendell Berry calls "'solving for pattern'—finding solutions that are 'good in all respects'; solutions that improve not just the part that seems to be the problem, but all parts of the system that contain it."¹² Specialty coffees and teas that are organic, fairly-traded and shade-grown need a decomposable cup to represent their values. The choice for an honest accounting of the benefits and costs associated with "coffee to-go" is **Geocup**. It's paper cup evolution!

Why Geocup Looks the Way It Does.

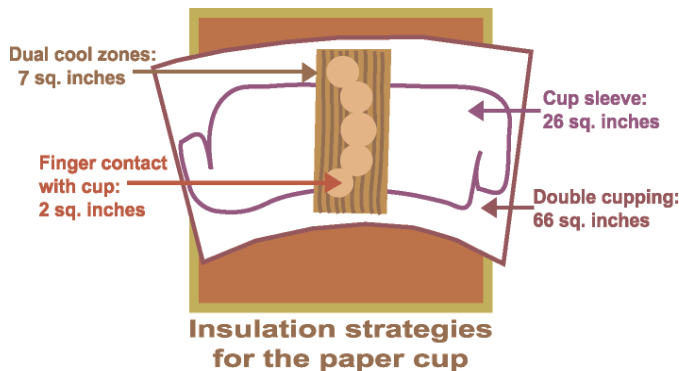
The hottest water streaming from your tap cannot legally exceed 140°F. So why does coffee's brewing—and serving—temperature exceed 200°F? In a word, flavor. According to chemical studies, the optimal water temperature for drip coffee is 195° to 205°F. Any colder doesn't extract enough essential oils from the bean and, above such temperatures, the acidity increases wildly.¹³ But what about the paper cup user? The coffee may be hotter than tap water for the average coffee drinker but it can only feel hotter to an aging populace. As we get older the skin covering our bodies gets thinner; it becomes less able to insulate the body. The roughly 2% of the cup's surface area that the five finger-



Finger grippin' good!

tips touch may seem hotter—even intolerable—to the older customer than the barista’s optimal brewing temperature of 200° F.

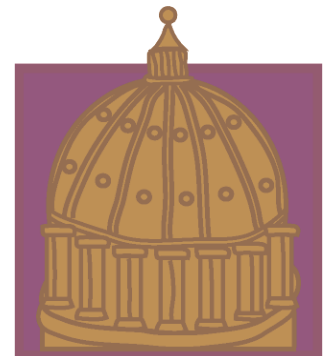
For standard paper cups, the material’s ability to quell the heat issue is hampered by cost. The cost of the paper represents roughly two-thirds the production cost to make a paper cup: paper is 65% of the cost of a cup versus 27% for profit and overhead, 7% for labor, and 1% for machine capital.¹⁴ Two properties of paper—caliper (its thickness) and density (its mass per unit volume)—are manipulated by the cup manufacture to provide some degree of sidewall insulation and strength. The high cost of paper however prevents cost-conscious manufacturers from properly insulating the entire cup. The standard cup’s failure to comfortably insulate is punctuated by the recent trends of double-cupping and slide-on cup sleeves.



Again, **Geocup**’s thermal insulation strategy substitutes quality and innovation for mass. Instead of the failed "blanket approach"—exemplified by standard paper cups—**Geocup** reallocates its fiber content to focus on that 2% of fingertip exposure. Two sidewall insulating strips, or **cool zones**[™], are attached to the cup diametrical to each other. These one-inch wide, palm-sized paper strips are like mini folded plates, trapping insulating air and minimizing contact between the fingertips and the hot

sidewall. The dual strips, which give the cup a distinctive look, follow the tapered shape of the cup, accommodating varying hand sizes. *The cool zones provide strength and insulation only where it is needed, thus reducing overall mass of the paper cup.* The main body of the cup, relieved of insulating duties, may be produced from a variety of fiber types—from long, strong plant fibers to short, stiff recycled fibers. "Off the shelf" cup technology is utilized to produce **Geocup**, adding further value to the package. (See Geocup Specifications in Request Geocup on our website.) Focusing cup insulation at two vertical strips also minimizes obstruction of the sidewall’s graphics area. Cup graphics are printed on **Geocup**’s textured brown surface with vegetable-based inks.

If Michelangelo spied a **Geocup**, he would surely recognize the lid’s organic geometry. The lid, like his St. Peter’s Basilica, is a polyhedral dome. This pure radial structure secures the lid to the cup and permits a multitude of drink openings at its lower edge without compromising the lid’s integrity. **Geocup**’s **wheel of drink ports** assures no-fault alignment with the cool zones as the lid is placed on the cup. The user simply opens any drink port that has aligned itself with a cool zone. Any port that is opened forms an internal backslash, controlling the flow of hot liquid to the user’s lips and not the lap. Unlike the "free-flow openings" of current domed lids, **Geocup**’s "flow-control lid" focuses on user control. The user decides when and where to break open the lid—engaging the flow-control features—and confidently enjoys the piping hot drink inside.

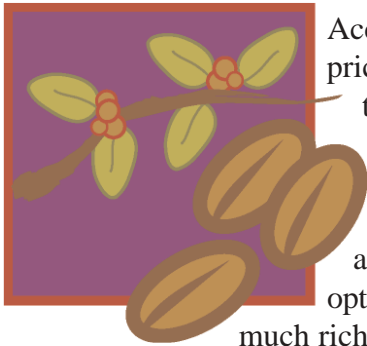


Retailers focus on the bean: Geocup focuses on the fiber.

As the movement of global citizenship evolves from grassroots to mainstream, so will our desire for information evolve from sound bites to stories. Since 1955, Juan Valdez® and his trusty donkey have been skillfully marketed to consumers as purveyors of coffee with a "consistent taste profile." The story behind the beans is simple yet superficial: 100% Colombian. Today, a more complete picture is emerging of coffee grown only on a narrow band of the Earth’s surface. At \$11.2 billion in exports, coffee is second only to oil in the developing world’s export commodities.¹⁵ Coffee is one of those tropical

exports that are produced exclusively in the Third World and consumed almost entirely in the First World.¹⁶ The industrial First World is awakening to the environmental and social impacts of its industrial farming methods exported to distant coffee growers. The new coffee story, like the **Geocup** story, reconnects the producer to the customer, the harvester to the good Earth and the market price to the real costs. "Roasters want really good coffee and they want a story behind it. And the more of a story they can share with their customers the better," says David Griswold of Sustainable Harvest Coffee in Emeryville, CA.¹⁷ So, as we order our grande latte, we may stop to ask: Is this coffee organic or "techified"? Is this cup compost-friendly? Does its price reflect its true cost to produce? Today, a new coffee story is being written and its characters are Bean and Fiber.

The Bean.



According to a 1998 report by Datamonitor, consumers are moving away from price-based purchasing decisions to decisions based on product variety and quality. "This quality-conscious purchasing trend is transforming coffee from a beverage with pseudo-commodity characteristics to one with cultural and prestige ties."¹⁸ "As the conglomerates are concerned only with price and consistency, this new specialty coffee industry considers origin, quality processing, and cultivation methods as relevant qualities of the bean. It also extends the option of choosing roasts, grinds, and so on to the consumer, thus creating a much richer, personal coffee landscape."¹⁹ Today, consumers are drinking slightly less coffee but a higher quality roast.²⁰ And quality beans in the specialty coffee industry are linked with healthy and self-supporting farming communities around the Earth's equator. Through certification programs, like Eco-OK²¹, specialty coffees—organic, fairly-traded and shade-grown—have gained legitimacy and a justifiable premium price.

The ubiquitous "to-go cup" is the ultimate ambassador of the specialty coffee industry and, more importantly, of the specialty coffee retailer—"the package is literally the face of the company."²² Standard disposable cup systems diminish the user's experience of the perfect cup of coffee with lids that pop-off, splash easily and open to sharp edges; with bad-tasting synthetic cups; and with design band-aids like cup sleeves and double-cupping. New and old cups alike are being marketed as alternatives to the recent double-cupping trend. The new cups include an excessively-wrapped paper cup by Insulair, Inc. and a plastic-entombed paper cup by Dixie Foodservice. The same old Styrofoam® cups are recast with a new slogan: "There's nothing upscale about double-cupping." These cup systems perpetuate the failed "blanket approach" to cup insulation. In time, these cups will be exposed for what they are: spiritless packages with no story; no honest accounting of their origin; and no connection to the organic product they contain.



No design band-aids

"It's the Fiber stupid!"

Paralleling the new specialty coffee story, is the **Geocup** story. As the specialty coffee industry infuses the bean with a history of origin and people, **Geocup** infuses the to-go cup with a new standard of design.²³ "Concern for the environment and for the disadvantaged of our society are the most profound and powerful forces with which to shape design."²³ **Geocup** chooses materials with extreme care and strives to meet all user needs equally. **Geocup** considers fiber source, non-toxic chemistry and design for older hands as relevant qualities of a superior paper cup to-go. More importantly, it enhances and extends the roaster's story about specialty coffees to the customer.

"Being is relationship," said the philosopher, Martin Buber. "U.S. consumers have begun to see that the disappearance of their beloved songbirds is related to their coffee-drinking habit. People can relate to

the relationship because they can see the decline of songbirds in their own backyards."²⁴

"Ornithologists have found that in full-sun [coffee] plantations, the number of bird species is cut in half, and the number of individual birds is cut by as much as two-thirds."²⁵ Songbird-friendly coffee—grown in the shade of wildlife habitat—now represents about 1% of the \$3 billion market for gourmet beans. Similarly, people are beginning to see that the loss of the world's vast intact forests is due to unrelenting consumption of forest fiber: junk mail, glitzy packaging and double-cupping are glaring examples. Today, the world is losing about 14 million hectares of forest cover each year—an area larger than Greece.²⁶ Tragically, four-fifths of our great primordial forests are gone.²⁷ The forests that do exist today provide familiar goods like lumber and fuel wood, but they also provide irreplaceable services like climate regulation and water recycling to name a few. People can relate to **Geocup's** new relationship with nature's fibers: a shift from high-impact fibers—that represent subsidized clear-cutting of habitat-rich forest systems and status quo paper mills with one of the highest toxic emissions per value of output—to low-impact fibers—that represent high-recycled-content, forest-free fiber blends, non-toxic chemistry and minimum-impact mills that reuse water and other ingredients in their manufacturing operations. As the bean reconnects the customer to people and place, **Geocup's** grainy finish, earthy tones and bark-like side strips reconnect the customer to the remaining natural forests: its soil, its trees, and hopefully, its spirit. When a durable commuter mug is not available, the next best "to-go" option for the customer is the decomposable **Geocup**. "While the tendency of consumers to ignore the effects of their consumption until it appears right under their noses remains frustrating to some, the fact that many consumers are now beginning to appreciate these linkages is cause for optimism— and for marketing."²⁸



The Great Debate: Paper or Plastic?

In the U.S., the specialty coffee market is experiencing exceptional growth. From 1993 to 1998, for example, the market value of foodservice outlets, like Starbucks and Gloria Jean's, grew at a rate of over 8% a year.²⁹ New distribution channels, like café kiosks, gas stations and java drive-throughs, are making it more convenient for customers to choose this high quality product. Mirroring the growth of specialty coffee is the single-use cup to-go. But which cup—coated paper or plastic foam—will emerge as the preferred specialty coffee cup? Already, the coffee juggernaut Starbucks has rejected the polystyrene foam cup in favor of the coated paper cup. "While some customers thought [foam] cups were an improvement over double-cupping, many disapproved. Polystyrene didn't reflect the quality people had come to expect from us, and the public perception is that plastic is even less environmentally friendly than paper," notes Howard Schultz, CEO of Starbucks³⁰. Thus, one of the great environmental debates of our times is: paper or plastic? "While consumers' perceptions and feelings about the impact of packaging on the environment may not be wholly reliable, it is clear that packages must be designed to be discarded easily and without guilt."³¹ So which package, drained of its bird-friendly brew, will be more guilt-free to toss away? The paper cup is intrinsically "natural" and a renewable resource, while the plastic cup is intrinsically "unnatural" and a non-renewable resource. A closer look at these competing packages may provide the answer.

The Paper Side.



The paper side of the story begins with the familiar bright white paper cup wrapped in a paper sleeve or double-cupped. This is a failed cup system. It represents the environmental nightmare of modern Western paper production, cheap oil and a forest management that emphasizes a constant flow of timber from the forest at the expense of irreplaceable services, such as wildlife habitat and water quality. It is a cup that exists as profit maximus—for nothing greater than

itself benefits. A viable paper cup for specialty coffees not only provides exceptional service, but benefits the larger context in which it exists, such as a healthy environment, fairly paid workers and a decent profit—otherwise known as the triple bottom line.

"Run mills full and steady," proclaimed the steel magnate, Andrew Carnegie. Carnegie engineered his mills for "scale"—large-scale production drove down unit costs—and "scope", making an array of products possible. Carnegie's titanic production model created value through a linear sequence of extraction, production and distribution. "The wastes from production processes, and soon the products themselves, were somehow disposed of somewhere else."³² The modern Western paper factories continue to use this "bigger is better," "no-fault pollution" approach to production. The following passage highlights the magnitude of this industry's impact:

"Modern Western paper factories are gigantic operations costing upward of a billion dollars. A big paper mill uses energy at the same rate as a small city. Paper mills turn entire forests—a seventy-five-acre clear-cut per mill per day—into different high-performance products by the freight-train-load. The logs are chipped and boiled in gigantic kettles of acid, or ground between huge plates run by thousands-of-horse-power motors, to release the cellulose fibers from the surrounding lignin and hemicellulose. Papermaking machines bigger than a house echo the Nepali hand-run process, but at a vast scale, forming a web of fibers that thunders through steam-heated driers and onto shipping rolls with the speed of a locomotive."³³

The bright white paper cup is a symbol of an industry in denial about its true costs of production. This is underscored by the fact that the status quo pulp and paper industry spends less on the research of cleaner technologies and alternative fiber blends, for example, than any other major industry—about 1% of sales.³⁴ This industry may well be the poster child for waste considering these startling figures: it takes 2-3.5 tons of trees to make one ton of paper; it uses more water to produce a ton of product than any other industry; and its toxic burden ranked third in the U.S. in 1999 with 226 million pounds of toxins released.³⁵ With its focus exclusively on trees as its only fiber source, the industry's main pulping process in the U.S. is "kraft" or chemical pulping—79% of total production capacity.³⁶ Here, a brew of chemicals is required to dissolve the lignin—or "nature's glue"—that holds the naturally brown wood fibers together. Getting rid of the lignin is part of what makes the pulping process so energy- and chemically-intensive *and* inefficient—only about one-half of the wood ends up in paper. Consumer preference for bright white paper has increased demand for bleached wood pulp—which accounts for 46% of production capacity.³⁷ Although newer bleaching methods are available today, the industry still uses elemental chlorine or chlorine derivatives for whitening, even though they are corrosive to machinery, dangerous to workers and extremely harmful when released to the environment. The average virgin paper mill releases 35 tons of organochlorines a day.³⁸

Again, the status quo pulp and paper industry relies solely on one fiber source—*forests*; they are granted access to federal lands—via 400,000 miles of logging roads—and its timber at below-market-prices; and, they remain unaccountable for their forest mismanagement and factory emissions. The bright white paper cup is the result of this industry's "cradle-to-grave" or linear production model. But the pulp and paper industry has made two miscalculations: first, they do not perceive waste as uncompetitive in the global information age; and second, they operate under a veil of secrecy and spin, believing this behavior eludes the public eye.

Geocup's grainy finish, earthy tones and bark-like side strips represent a big picture approach to producing paper cups. Unlike the status quo cups, **Geocup** focuses its fiber on that 2% of fingertip exposure. It reorients its cup production toward circular flows of material, energy and water—to a "cradle-to-cradle" or cyclical production model.

Big Idea No. 2: Waste diminishes competitiveness in the global information age. Cyclical product systems, free of toxins, complex materials and linear thinking, create revolving value for the manufacturer. "Manufacturers must not only consider the value of a product as it goes out the door, but also its value when it comes back in the door."³⁹

Geocup proposes a new fiber strategy for paper cups—and for all packaging—in the 21st century: *100% decomposable, forest-free fiber blends*. The target mix for these alternative fiber blends is 50% post-consumer recycled fiber (mostly short, stiff fibers) and 50% non-wood and/or "tree farm" fibers (mostly long, strong fibers). Although similar 50/50 blends are commercially available today, they are competitively marginalized by federal subsidies and overcapacity of the big virgin paper mills. Given a level

Forest - free fiber blends



playing field, with no subsidies or hidden costs, alternative fiber blends can compete with forest fiber on strength, basis weight and price. Three perceived barriers to commercial acceptance of these fiber blends are performance, machinability and FDA approval. Already, progressive paper converters, like Jefferson Smurfit of Middletown, Ohio, are developing FDA-approved, high-recycled-content cupstock and forming it into hot cup prototypes.

Geocup's fiber strategy is supported by research from the Tellus Institute of Cambridge, Massachusetts. Their findings show that the lion's share of environmental impact is created *upstream* from the product during material extraction, processing and manufacture. Disposal of the product—incineration and land-

fills—is only 1% of total impact.⁴⁰ To drastically reduce upstream impacts, **Geocup** rejects chlorine-bleached forest fiber and draws upon the emerging three-fold sources of forest-free, 50/50 blends: post-consumer recycled fiber, plant or non-wood fiber and plantation or tree farm fiber.

Creating new paper from old is an efficient process—for each ton of used paper, nearly a ton of new paper can be produced. Reprocessing old paper requires 10 to 40% as much energy as virgin pulping.⁴¹ The hues of 50/50 blends—off-whites, tans, beiges and browns—will come to symbolize a reduction in chemical use, especially chlorine. The potential for using old paper to make new paper has yet to be fully exploited—today's 43% recovery rate worldwide is far below the 70% or more that is possible.⁴² In the U.S., a positive trend is emerging: growth in recycled-based paper manufacturing capacity is now outpacing growth in virgin paper production capacity.⁴³ "Non-



wood fibers were once the sole source of raw material for pulp; wood pulping techniques were not even invented until the middle of the 19th century."⁴⁴ Non-woods—agricultural residues from crops and annual plants like kenaf—provide only about 7% of the world's total fiber supply for paper. Increasing that share to 20% or more could make use of a resource that is currently burned and provide farmers with additional income, reduce chemical pulping and cut demand for wood pulp.⁴⁵ One of non-wood's primary advantages over wood is its low lignin content—riding commercial fiber of its chemical-intensive legacy.



Plantation or high-yield tree farms may be a reliable short-term solution to our fiber needs—farming trees is a better option to clear-cutting forests. Generally, they are made up exclusively of one species of tree (most often softwood) and harvested every one to eight decades. As a result, the frequency of disturbance to the soil and water quality is minimized, increasing habitat value. Plantations can be established in abandoned or marginal agricultural areas and can enhance the environmental value of such lands.⁴⁶ As of 2000, the world had 113 million hectares in tree plantations, less than 3% of the total 3.9 billion hectares in forest. In other words, *nine tenths of the world timber harvest came from natural forest stands, while one tenth came from plantations*⁴⁷



Lastly, a holistic approach to producing alternative fiber blends is gaining market share on the status quo paper mills despite their unfair advantages. In the 1990's, the first zero-effluent or minimum-impact mills (mini-mills) came on-line in the U.S. and began recycling 200,000 tons of wastepaper per year. (In 1997, the U.S. produced 86,477,000 tons of paper and paperboard.)⁴⁸ These alternative paper mills use minimal inputs of chemicals, water and energy to produce paper. Its inputs and other materials are reused in their manufacturing operations—moving it toward a closed-loop system that completely eliminates releases to air, water and land. Another advantage to these non-polluting mini-mills is that they may be located virtually anywhere—especially near urban areas which are sources of both fiber supply and paper demand. The best news about these mini-mills is a fiber recovery rate of 98% (versus 36% for status quo mills), thus becoming the industry's low-cost producers.⁴⁹

Big Idea No. 3: Nature sequesters certain organic substances—like oil—and carefully manages the great life-sustaining systems—like forests—to regulate our biosphere and provide a cornucopia of goods and services. Our millennium challenge, as creative human beings, is to *redesign* materials and processes that respect, protect and foster Nature's grand design.

To get from where we are in papermaking to where we want to be will take precious time at the current rate of forest loss. Transitioning to forest-free, 50/50 blends will require courageous legislation like taxing the polluting status quo industries and, as Lester Brown of the Earth Policy Institute suggests, "shifting subsidies from building logging roads to tree planting to increase tree cover worldwide."⁵⁰ It will also take individual acts like boycotting paper products made with forest fiber—including copy paper, toilet paper *and* paper cups. As we re-engineer the status quo mills and increase production of the new 50/50 blends, transitional fiber blends—free of forest fiber—are currently available to meet consumer demand. The premier version of **Geocup** will use several of these transitional fiber blends. Specifically, the cup will be a lightweight blend of roughly 90% tree-farm fiber and 10% pre-consumer recycled fiber. The cool zones will be a lightweight blend of roughly 50% non-wood and 50% post-consumer recycled fiber. All blends will be certified by our Chemical Watch Program (see below).



The hidden costs of paper production, like the hidden costs of coffee production, are no longer acceptable to the educated customer in the global information age. The growing pressures on all the purifying and reproductive systems of the Earth—including forests—will only intensify as world population increases by 9,000 people per hour. **Geocup** signals a new era of design: design that recognizes limits to our natural resources such as limits to degraded forest systems; limits to heat-trapping CO2 in the atmosphere; and limits to toxic chemical pollution. Yet recognizing limits will not be easy if we define progress only in terms of material consumption. Surprisingly, constraints to our living

patterns can unleash enormous creative energy. Cool Zones, 50/50 Blends and Chemical Watch are just a hint of the new ideas that await us as we move toward a sustainable eco-economy.

Big Idea No. 4: Creating limits to our living patterns—sustainable yields, renewable resources, non-toxic chemistry—unleashes enormous creative energy and a potential to improve people's lives qualitatively rather than quantitatively.

The Plastic Side.

The plastic foam cup story begins with a visit to a foam cup manufacturer's website: www.dartcontainer.com. Here, an argument for foam cups over paper cups is presented: "The Case for Disposable Products." The author contends that "foam cups, more so than paper cups, minimize damage to the environment."

Two main reasons for this conclusion are cited: "foam cups present better disposal options (source reduction, biodegradation, waste-to-energy, landfill volume and recycling); [and], in comparable life cycle analyses (LCA's) foam appears to fair better, environmentally, than paper." (Supposedly, LCA's quantitatively measure a product's impact to the environment throughout its linear production sequence—material extraction, processing, manufacture and distribution, use and disposal.) "[But] one of the most obvious advantages plastic foam cups have over [paper] cups is that foam insulates better than paper. Paper cup users frequently use two cups together...this 'double-cupping' doubles the environmental impact of paper cups, to say nothing of the cost."⁵¹

The Tellus study of packaging materials takes the teeth out of the first claim: disposal is only 1% of total environmental impact; impacts *upstream* from the cup—during material extraction, processing and manufacture—are what matter most. The second claim, that foam beats paper in LCA's, relies on fuzzy math. Life cycle analysis is similar to a concept promoted decades ago by the visionary engineer Buckminster Fuller. Fuller called it "cosmic accounting," a term whose boundlessness suggests the difficulty of actually being able to do it.⁵² Peter Cocatas, a consultant who specializes in LCA's said that he had not yet encountered an example of a material or a process that is superior to another in every situation. It's all very, very complicated.⁵³

So where does this leave the great cup debate? What makes one cup qualitatively better than another? What's the big picture? The answer lies in the simple notion that if we do not create waste in the first place, than the idea of a bad cup to-go is just that, an abstract idea. Let's assume that we have decided to "bite the bullet" and transition to a sustainable eco-economy—one where prices reflect all the costs of production. What are the *key issues* in making anything that will affect change from a linear, extractive economy (cradle-to-grave) to a cyclical, restorative economy (cradle-to-cradle)? A big picture perspective focuses on two key issues: **non-toxic chemistry and service cycles.**

The Big Picture.



In making either a coated paper or plastic foam cup, we alter the nature of organic (carbon-based) materials with temperature, pressure and chemical reactions. In current economic accounting, the end result is the stuff with value (the cups) and the stuff without value (emissions to the environment). All of these production emissions to the environment are chemical in nature. Some of these emissions are not even considered "classic pollutants." Carbon dioxide, for example, is a clean, natural, common element that we add to the atmosphere—accelerating global warming—as we burn fossil fuels.

Emissions of many synthetic chemicals *are* classic pollutants and, until recently, their effects to the community of life systems have been unclear.

Otherwise known as persistent organic pollutants, or POP's, these man-made chemicals are immune to degradation in the environment. POP's are dangerous intruders in the benign and cyclical chemistry of the Earth. "One of the most profoundly important discoveries about life is how similar all of it is, chemically, from bacteria to behemoth."⁵⁴ Creating chemical compounds that spurn breakdown and integration into natural systems is not only reckless, but "biocidal." Victor O. Sheftel in *Toxic Properties of Monomers and Additives* makes clear the impact of synthetic chemicals upon living systems:

"The occurrence of acute toxicity due to plastics materials used in contact with food and drinking water is most unlikely, since only trace quantities of toxic substances are likely to migrate. Polymeric materials [or plastics] may produce chronic effects as the result of repeated ingestion of a number of small doses, each in itself insufficient to cause an immediate acute reaction but in the long term having a cumulative toxic effect. Thus, [plastics] and other widely used [synthetic] chemicals have brought to light the problem of

the protracted action of low concentrations of chemicals upon human health. [It's important to note that] the high-molecular mass polymer itself does not pose a toxic hazard, being inert and essentially insoluble in food. [It's the leftover monomer and an assortment of additives] like plasticizers, antioxidants, catalysts...stabilizers, pigments, fillers, etc. [lurking in plastics] that have the potential to be very reactive and biologically aggressive."⁵⁵

In 1940, at the dawning of the Chemical Age in America, we were making half a million tons of industrial chemicals each year. In the 1990's we were, according to the latest Norton History of Chemistry⁵⁶, making 200 million tons of industrial chemicals each year or 1,500 pounds for every person in the U.S. "Around the world," notes Theo Coburn, a senior scientist at the World Wildlife Fund, "100,000 synthetic chemicals are on the market. Each year 1,000 new substances are introduced, most without adequate testing and review. At best, existing facilities worldwide can test only 500 substances a year (for cancers and gross birth defects only). In reality, only a fraction of this number actually do get tested."⁵⁷ And, there is growing evidence that many carbon-based synthetic chemicals disrupt hormones, impair reproduction, interfere with development and undermine the immune system of all living systems—including yours and mine. The reality check is this: we encounter complex mixtures of chemicals daily—there is never one alone as when tested. (In fact, the average person in the U.S. carries over 700 persistent synthetic chemicals in his or her body.⁵⁸) Synthetic chemicals, unable to be broken down naturally, travel up the food chain to the top predator—us.

Key Issue No. 1: Benign Chemistry. The time has come in the Chemical Age to shift the burden of proof to the pharmaceutical, chemical and polymeric(plastic) manufacturers so that they cannot produce, sell and dispose of a chemical unless its degradation in the environment is well understood. In other words,



provide proof of **safety** rather than proof of **harm**. This concept, otherwise known as the Precautionary Principle, was embodied in documents prepared at the Earth Summit in Rio de Janeiro in 1992. Scientist Theo Colborn suggests that "if chemical and plastic manufacturers articulate to the public 'a set of principles of chemical design and use,' it would allow us the benefit of innovative materials without undue exposure and risk."⁵⁹ Plastic foam cups are 100% synthetic chemicals—made from polystyrene, which is derived from styrene which, in turn, is derived from the plastic feedstock benzene—a polyaromatic hydrocarbon and known carcinogen.⁶⁰ It is not how we dispose of them that really matters or how much of the plastic foam we use per unit of service. It is their *chemical legacy* that critically matters to us and to all living things.

Through our **Chemical Watch™ Program**, **Geocup** is taking inventory of the synthetic chemicals and their additives used to produce current paper cup systems. By rejecting the worst and researching benign alternatives, the number of chemicals used in the manufacture of **Geocup** is radically reduced. **Geocup** is made simple. It avoids a chemical legacy.

(Note: **Geocup**'s design trajectory aims for 100% decomposable. To start, **Geocup1** is 95% paper fiber and 5% plastic film. Specifically, its moisture-resistant coating on the cup's inside face is low-density polyethylene film—a low-impact plastic⁶¹—which will evolve to an advanced aqueous clay coating.⁶² **Geocup**'s plastic lid is thermo-formed polystyrene sheeting—a high-impact plastic⁶³—also used in the expandable bead form as cups—which will evolve to a 2-ply, all-paper lid in **Geocup2**.⁶⁴)

The Picture Gets Bigger.

The service cycle, or use-life, of a to-go cup is fifteen, thirty, maybe sixty minutes—then it is tossed away. A commuter mug is used many times over—its use-life is weeks, months, maybe years before its dumped. Hence, a longer use-life—or more value—can be extracted from the reusable commuter mug.

In reality, both types of packages can provide valuable service if they're made from the right stuff. But what is the right stuff? **Geocup** represents transitional design to an economy that will use the right stuff; to a sustainable eco-economy where *cyclical* production (characterized by non-toxic chemistry and material purity) displaces *linear* production (characterized by reckless chemistry and material complexity). An eco-economy revolves inside—and is limited by—the great natural cycles of the Earth. The products and materials of an eco-economy are valued for the service they provide rather than the prestige they afford. Thus, human needs are fulfilled using just enough "Earth-stock" or "synthetic-stock," only for a time, and then returning it to its service cycle for future needs.

Service cycles are divided into the familiar modes of durable and decomposable (formerly disposable). Durable items (stuff lasting one year or more) are made from synthetic-stocks—non-renewable resources altered by multiple-step, non-toxic chemistry. Decomposable items (stuff lasting less than one year) are made from Earth-stocks—renewable resources altered by single-step, non-toxic chemistry. Both are priced to reflect their true costs to produce (financial, environmental, machine and labor). In the few decades transition to an eco-economy (and we really only have a few), transitional materials will be necessary as we search for simple and benign alternatives to our many complex and potentially toxic materials. Transitional materials however shall follow common sense: use simple rather than complex materials; increase recycled rather than virgin content; and formulate non-toxic rather than toxic chemistry. Based on service cycle, a decomposable cup, like **Geocup**, is the most suitable for one-time use. Petro-chemical derivatives, like plastics, are the most suitable for durable commuter mugs.

Key Issue No. 2: Service Cycles. In a sustainable eco-economy, products and materials exist in one of two service cycles: durables or decomposables. Reckless chemistry feeds the "toxic trap"—the abyss of biocide—breaking the service cycles and diminishing the great natural cycles.

The great ancient cycles happen all around us as we busy ourselves with daily life: the hydrological, carbon, nitrogen, seasonal and respiratory cycles to name a few. In attaining a sustainable eco-economy, we must recognize, protect and foster all the great cycles that provide us with life-sustaining goods and services. "In the future (whereas the humans cannot make a blade of grass)," notes Thomas Berry, "there's liable not to be a blade of grass unless humans accept it, protect it and foster it."⁶⁵

The Great Cycles



The Service Cycles



At last, the specialty coffee movement has two viable containers to represent their values: the decomposable **Geocup** made from forest-free fiber blends⁶⁶ and the durable plastic commuter mug made from Chemical Watch plastics. Transitioning to an eco-economy will take enormous creative energy and a shift to cyclical thinking, but it will also take personal courage and sacrifice. To make the right choices for our future, the informed citizen is our best hope. Product history labeling and full-cost pricing re-establishes the feedback loop between discerning customer and limits to our natural resources.

Geocup's Target Market.

In their landmark book, *The Cultural Creatives*, sociologist Paul Ray and psychologist Sherry Ruth Anderson draw on thirteen years of research to reveal three subcultures today in the U.S. "The dominant subculture—48% of U.S. adults (93 million out of 193 million adults)—are the Moderns who accept the commercialized urban-industrial world as the obvious right way to live. Theirs is the comfortable America of a rising stock market and a falling awareness of whatever lives outside its concerns. The

Traditionals—24.5% or 48 million adults—fend off an intrusive modern world and look for ways of life that are comforting and familiar repetitions of their youth. Theirs is a culture of memory. They place their hopes in the recovery of small-town, religious America—a hazy nostalgic image corresponding to the years from 1890 to 1930."⁶⁷ Between the extreme positions of the Moderns and Traditionals lies a third subculture. "Rather than defending an old way of life, Cultural Creatives (CC's)—26% or 50 million adults—are bridging an old way of life and a new one. They want to carry forward what is valuable from the past and integrate it with what's needed for the future. CC's look for ways to connect what has been broken apart. The strength of the CC's is that they are the part of the population most likely to carry forward a positive vision of the future."⁶⁸

Cultural Creatives are looking for the *big picture* by tracing underlying interconnections and relationships. "They like a systems overview: they want to know where a product came from; how it was made; who made it, and what will happen to it when they are finished with it. Ecological concerns inform most CC's choices, including what products they buy, the movements they support and the life choices they make. The CC's have jump-started the business of consciousness and this new market is growing at a rate that surpasses almost everything else in today's economy—except perhaps computers and the Internet."⁶⁹ The growth of the industry that supports "lifestyles of health and sustainability" (or LOHAS⁷⁰) generated U.S. sales of \$230 billion in 2000 (estimated at \$500 billion for the whole planet).⁷¹ Where the growth rate for the U.S. economy as a whole is 2 to 4 per cent a year, many of the industries that serve the consciousness movement are growing at 10 to 20 per cent a year. The size of the population they serve (currently 63 million U.S. adults), and the money involved, is doubling every four years. The expected earnings for this industry as a whole in the year 2000 are about \$75 billion.⁷²

Geocup, like all products and services tailored for LOHAS, stands at the confluence of the consciousness movement and modern business. LOHAS consumers are not simply environmentalists; what drives LOHAS consumers is health—that of their families and the planet, and the future of society. Today's 6 billion inhabitants living outside the natural cycles of the biosphere will be difficult to sustain in the future, especially as we add some 79 million more people each year. "To make people better off requires no new theories, only common sense," declare the authors of *Natural Capitalism*. "It is based on the simple proposition that all capital (human, natural, financial, and machine) be valued."⁷³

The glossy white paper or plastic coffee cup, fashioned from forest fiber or fossil derivatives, infused with toxic chemistry, used once and tossed in a landfill, is not a recipe for a viable and vibrant way of life. **Geocup** is about affecting change to a sustainable eco-economy. It carefully chooses materials and strives to meet all needs equally. It symbolizes cyclical rather than linear thinking—mimicking the great cycles that happen all around us. It begins with transitional materials, void of the worst chemicals and fibers, and evolves toward its proper service cycle—decomposable or durable. Most importantly, **Geocup**—and products like it—will be priced to reflect its true cost to produce. Geologist Thomas Berry captured the spirit of **Geocup** best when he said, "We are in a reciprocal relationship. We are touched by what we touch. We are shaped by what we shape. We are enhanced by what we enhance."⁷⁴

"Once you change your mind about what the environment is for, you change your mind about everything."

— Aldo Leopold

Good Health,

Tim Johnson
Big Picture Packaging

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- ² Thomas Berry, *The Ecozoic Era-The Thinking of Thomas Berry*. See www.earthdreams.net.
- ³ Mark Inman, *Cupping for Sustainable Quality*, Fresh Cup Magazine, April 2002.
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- ⁶ Visit equalexchange.com, taylormaidfarms.com and merchantsofgreencoffee.com.
- ⁷ Paul H. Ray and Sherry Ruth Anderson, *The Cultural Creatives, How 50 Million People Are Changing The World* (New York: Harmony Books, 2000).
- ⁸ Thomas Hine, *The Total Package* (New York: Little, Brown & Co., 1995).
- ⁹ See Price Comparison of Cup Systems in Request Geocup on our website.
- ¹⁰ See Geocup2 in Future Design on our website.
- ¹¹ Paul Hawkin, Amory Lovins, L.Hunter Lovins, *Natural Capitalism* (New York: Little, Brown & Co., 1999).
- ¹² Ibid.
- ¹³ See www.coffeefaq.com.
- ¹⁴ Estimated production costs by Sherwood Tool Corporation, Kensington, CT.
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- ¹⁷ Fresh Cup Magazine Almanac, *Making Sense of Sustainability, Part II*. See www.com.
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- ²⁴ Gregory Dicum and Nina Luttinger, *The Coffee Book* (New York: The New York Press, 1999).
- ²⁵ Brian Halweil, *Why Your Daily Fix Can Fix More Than Your Head*, WorldWatch Magazine, May/June 2002.
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- ⁶⁶ Geocup1, a transitional cup design, is 95% paper fiber and 5% plastic film.
- ⁶⁷ Paul H. Ray and Sherry Ruth Anderson, *The Cultural Creatives, How 50 Million People Are Changing The World* (New York: Harmony Books, 2000).
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- ⁶⁹ Ibid.
- ⁷⁰ LOHAS market segments include sustainable economy, ecological lifestyles, healthy living, alternative healthcare and personal development.
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