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CAL POLYSTYRENE

Clare Johnson

Each day when you get your cup of java, your cheeseburger and fries, or your nachos-to-go, your food will probably be served in a Styrofoam polystyrene container. Styrofoam is actually the brand name adopted for commercially sold polystyrene products such as coffee cups, “to-go” boxes, and disposable picnic plates. Polystyrene foam is a type of vinyl chloride polymer blown into a foam-like material to create the lightweight white material we see almost everywhere today.¹ It is famous for its durability, light weight, strength, and inexpensive pricing. A Styrofoam cup is actually six times cheaper to manufacture than a paper cup.² Nevertheless, what most people don’t realize is that the cheap coffee cup is made much more expensive by the terrible consequences that come along with the manufacturing and use of polystyrene products.

Cal Poly is a campus that prides itself on sustainable development, meaning that we are committed to “enhancing and protecting ecosystems and biodiversity, improving air and water quality, reducing solid waste, and conserving natural resources.”³ We boast an extensive recycling program and pay close attention to environmental issues such as fuel efficient transportation, water and energy conservation, and responsible planning in building projects, yet still we have ignored the abundance of waste produced by the non-biodegradable Styrofoam products used in almost every eating establishment on campus. It’s everywhere, and if not forever, it’s definitely for a long time. Polystyrene foam will not only outlive all of us in landfills across America, but it is also harmful to human health and destructive to the environment. Cal Poly, therefore, should discontinue its use of Styrofoam products on campus and consider alternative food packaging in effort to maintain its goals of being a sustainable campus—and for the sake of every student’s health.

Styrofoam is everywhere on campus. According to a representative of Cal Poly's Campus Dining in a May 2004 email, "Campus Dining areas (Lighthouse, Julian's, Campus Market, The Avenue, Lucy's etc.) use a combined average of 12,000 polystyrene beverage containers each week."⁴ If we multiply 12,000 cups by 10 weeks each quarter for three quarters, the length of a Cal Poly school year (not counting WOW and finals weeks), Cal Poly contributes an average of 360,000 Styrofoam cups to nearby landfills each year. Furthermore, as shocking as those numbers may be, they constitute only an average and do not include the other Styrofoam products used on campus, such as plates and to-go boxes at Vista Grande Café and Campus Market, nor the waste produced during summer quarter. That recycling bin next to every trash can campus may appear to demonstrate how environmentally minded we are, but in reality our Styrofoam waste goes to the nearby Cold Canyon landfill six miles south of San Luis Obispo, where it will stay forever, or at least for hundreds of years.⁵

We know where it is, but many of us don't really know what Styrofoam is. Polystyrene foam was invented by Dow Chemical Company more than 50 years ago and was first used by the Coast Guard in 1942 for use in a six-man life raft.⁶ The Dow Chemical Company website claims ownership over the trademarked name "Styrofoam," which they say refers to building materials such as pipe insulation and craft materials, but discredits any association of itself with polystyrene in the form of coolers, packaging materials, or coffee cups, as these products have a negative reputation.⁷ The people at Dow fail to take credit for their own invention, recognizing the threat that public criticism of that very invention places on the company as a whole.

Unlike Dow, some Styrofoam manufacturing companies that defend the production of polystyrene products like to argue that the material is in fact recyclable. Some college campuses, like the University of Southern California, have tried to initiate polystyrene recycling programs, like the one that began back in 1990,⁸ but according to a current usc student, foam recycling no longer exists on campus.⁹ A couple of Cal Poly students, back in 1991 and 1992, even wrote their senior projects about the possibility of starting a program on our campus, but obviously those attempts failed as well.¹⁰ This failure is understandable, given that according to the San Luis Obispo County Integrated Waste Management Authority, San Luis Obispo County is not capable of recycling Styrofoam products of any kind at this time.¹¹

With the exception of protective packaging such as "peanuts," some sources have reported that the recyclability of Styrofoam might actually be a myth devised by Public Relations representatives for polystyrene manufacturing companies. The International Plastics Task Force website offers one reason: "Presently, food service polystyrene packaging is not recycled because it is not economically sustainable," meaning that recycling these products is too expensive.¹² Since the quest for finding a reasonable and environ-

mentally conscious solution to the polystyrene issue has been unsuccessful, we should therefore consider our obsessive use of the product on our campus and then find an alternate solution to our excessive wastefulness.

Cal State Long Beach (CSULB) is a good example of a university committed to environmental sustainability connected specifically to the issue of polystyrene products on campus. A group of students at Cal State Long Beach began a campaign last year against the surplus waste produced by Styrofoam food packaging products. The group's initial goal was to educate the student population about the dangers of the harmful products they use every day, but what began as research soon led to the group's petitioning to eliminate all Styrofoam products on campus. The Long Beach students also constructed an art exhibit with old Styrofoam containers, using the project to demonstrate how Styrofoam harms the environment. Finally, they contacted the local media to publicize their cause.¹³ Although Styrofoam has still not been banned on the CSULB campus, these students' efforts were certainly a step in the right direction. Why has our own environmentally conscious campus not taken any action regarding this issue? It seems to me that we have continuously ignored the facts surrounding the dangers of this product. Perhaps after we realize the gravity of this situation we, too, will follow the example of the students at Long Beach and work toward a ban of Styrofoam here at Cal Poly.

Unfortunately for the anti-Styrofoam movement, polystyrene products are durable, inexpensive, readily available, and abundant virtually all over the world, including here on our campus. Why should we be concerned? What are the facts about Styrofoam food packaging?

First of all, Styrofoam products are a health hazard. Toxic chemicals leach out of polystyrene product containers into the food they contain and can be detrimental to our health and reproductive systems. Polystyrene production involves the use of two carcinogens (cancer causing agents) benzene and styrene.¹⁴ According to research conducted by Mark Dangler, a Cal Poly Chemistry student, for his senior project on styrene leaching from Styrofoam cups, "Several adverse health effects have been attributed to styrene. At exposure levels above 100 parts per million, humans experience acute mucous membrane irritation with the eyes, nose, and throat particularly affected."¹⁵ Dangler goes on to report that increased levels of styrene concentration may cause fatigue, irritation, feelings of inebriation, and a decrease in concentration ability.¹⁶ Styrene would be less of a problem if the molecules stayed in our coffee cups, but another study confirmed that "Styrofoam drinking cups leach Styrofoam into the liquids they contain. The cups apparently lose weight during the time they are at use [. . .] different materials cause some foam to dissolve into the liquid vessel."¹⁷ So in reality, we are ingesting the toxic chemicals that have been proven to leach out of the Styrofoam containers from which we eat and drink.

Furthermore, these findings about health damage and molecule leakage are compounded by styrene's ongoing presence in the human body. A study by the Foundation for Advancements in Science and Education reported that "styrene had been found in 100 percent of human tissue samples and 100 percent of human nursing mother's milk samples."¹⁸ These adverse health effects and styrene's ability to linger as a carcinogen in everyone are alarming. Although the average cup of coffee served in a Styrofoam cup will not immediately affect human health on these levels, the buildup of styrene in the body over time can lead to these negative effects.

Research also indicates that toxic chemicals in polystyrene products can have long-term consequences on the reproductive systems of both men and women. The styrene polymers in polystyrene mimic reproductive sex hormones and inhibit the production of healthy natural sex hormones. The National Health Institute of Japan reported that "one type of toxin [found in polystyrene], known as bisphenol-A [...] lowers sperm production in males and reduces the number of full-term pregnancies in females."¹⁹ These extra hormones are ingested when polystyrene chemicals leach from Styrofoam into food products that are then eaten.

Beyond the obvious bad effects on the human body, a further argument in the case against polystyrene is the environmentally destructive process that creates the product. To begin with, polystyrene products are manufactured using petroleum, a substance that is a hot topic in media right now because it is so limited. Petroleum cannot be recycled or renewed and is quickly disappearing worldwide due to our dependence on it for gasoline and manufacturing processes—such as the production of polystyrene. The United States alone produces over 25 billion Styrofoam cups each year using these petroleum-dependent processes.²⁰ With gas prices rising and the war in Iraq partly blamed on our need to control fossil fuel sources, should we really be wasting this precious resource on a product as simple as Styrofoam?

Adding to the petroleum-based debate about polystyrene production is the environmental danger from the chemicals used in manufacturing. Two specific chemicals, known as "blowing agents," which shape the polystyrene into its final form, have been proven to have hazardous effects on air quality and the ozone layer. Polystyrene foam manufacturers use an assortment of chemicals called chloro-fluorocarbons (CFCs) to puff up the Styrofoam once it has been molded; however, these chemicals find their way from the earth's surface up to the stratosphere, where they destroy the ozone layer.²¹ Our ozone layer is essential in filtering out the sun's harmful ultraviolet rays, but with the depletion of the ozone particles from CFCs, humans become more susceptible to sunburn, skin cancers and eye damage.²²

In addition to CFCs, polystyrene producers also use Pentane as a blowing agent. Pentane, however, is difficult for humans (like workers) to handle because it is highly explo-

sive and difficult to contain. For these reasons, Pentane use creates dangerous working conditions for the employees who manufacture polystyrene products. These workers' cancer rates are much higher than the rates for manufacturers of other industrial products.²³ Pentane is also known to cause earth-level smog pollution, immediately damaging the quality of our air.²⁴ According to other reports, seven million pounds of toxic chemicals are released into the environment annually due to the production of styrene products.²⁵ It is frightening to think that we are not only ingesting these chemicals through contamination of our food, but also breathing them in our air. As we can see, the processes used to manufacture Styrofoam are immediately destructive to our health and the environment.

As a final argument against the manufacture and use of polystyrene products, we should consider the disheartening ways that these non-biodegradable products will litter our earth forever. Our foam waste often breaks up into little pieces, causing animals who think it is food to choke or to die of clogged digestive pathways. The reality, unfortunately, is that polystyrene foam products will never decay—in fact, they will outlive all of us, hiding in landfills, littered on beaches, discarded in parks and along roadsides, and floating in streams long after we have enjoyed our cup of coffee to go.

Is the situation hopeless? Perhaps not. First, we can look back for inspiration to the anti-Styrofoam campaign against the fast food chain McDonald's in late 1980's and early 1990's. Nicknamed the "McToxics Campaign," it arose when many environmental health protection agencies pushed McDonald's to abandon its use of the Styrofoam that packaged every hamburger it sold nationwide. At the time of the campaign, *Modern Plastics*, the plastic industry journal, reported that McDonald's was "the largest single user of polystyrene, the chemical used to produce foam food packaging... [and that] the polystyrene production process generates the 5th largest amount of toxic waste of any single chemical production process."²⁶ As a result of these statements and further research by grassroots organizations nationwide, McDonald's finally backed down and decided to phase out its Styrofoam use and solid waste output by 90%.²⁷ The McToxics campaign is a good example of how seriously this issue has been taken on a national level, at least once, and how powerfully the decisions of large multi-national corporations can affect our environment.

If action can happen at the national level, why not here at Cal Poly? One response to the overuse of Styrofoam products on our campus might be to consider adopting another product, like unbleached paper, which biodegrades. Paper products are more easily recycled, and the production of unbleached paper requires very little energy and uses no chemical pollutants.²⁸ Although paper products may be slightly more expensive, this alternative would avoid all of the problems associated with the production and use of Styrofoam and would keep us consistent with Cal Poly's goal of expanding our recy-

cling program on campus. More important than the urgent decision to adopt a new product in the place of Styrofoam is to first educate our campus about the ways that Styrofoam products are polluting the earth and harming our health.

Cal Poly students and faculty alike need to draw their attention to this issue and to the many adverse health and environmental effects of Styrofoam food packaging products. The toxic dangers of polystyrene have long been kept secret by manufacturers who make billions of dollars each year from their environmentally harmful products. How long will it take us to realize that we should not be compromising our health simply to save a couple cents on a “to-go” container? Furthermore, we must also remember that the Central Coast is a beautiful place to live. As residents here, it is our responsibility to preserve the beauty of our home. In many ways we have already committed ourselves to being a sustainable campus, preserving and protecting our resources, yet we seem to have ignored the need for change regarding our overuse of Styrofoam food packaging products on campus. Now is the time to educate our peers and teachers about how harmful polystyrene is for our environment and our health. We can hope that someday our children’s children will be able to come enjoy the hills, creeks, and beaches of San Luis Obispo County without a Styrofoam cup to pollute their bodies, their earth, or their experiences. 

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Johnson: Cal Polystyrene

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