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SOLID WASTE AND DEGRADABILITY:  
SAVING GRACE OR FALSE PROMISE?

by

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#### ABSTRACT

Since reportedly 70 percent of landfill waste is capable of natural decomposition, "degradability" and "biodegradability" are terms hospitality operators must understand to: better control solid waste (SW), intelligently select degradable products and alternatives, comply with regulations, and respond to public concerns. Consumer and legislator action for mandatory degradability of disposables, and for bans on nonbiodegradable plastics, appear linked to fundamental misunderstandings; e.g. that landfills are composting facilities, and that plastics have no redeemable qualities. In fact, degradables can interfere with recycling/resource recovery, and do not necessarily result in a net reduction of SW toxic pollution, volume, or litter. This article addresses the question whether using degradable products rather than non-degradable products will help the solid waste crisis.

#### KEY WORDS

biodegradable  
compost  
degradable  
disposables

organic waste  
plastic versus paper  
solid waste

#### INTRODUCTION

The proliferation of solid waste regulations, with their attendant costs and operational complexities, repeatedly is named by hospitality industry operators as among the most pressing problems of the 1990's. To manage and minimize solid waste, hospitality operators are advised by the Environmental Protection Agency (EPA), and countless other organizations, to reduce, reuse, and recycle. Yet most operators will still use some disposable products; for example, newspapers distributed to guest rooms. Bob Blaze, foodservice director at the University of Oklahoma in Norman provides another example of semi-dependence on disposables; "...We have converted from disposables to permanent ware in some places, but we can't eliminate (the use of disposables

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in) carry-out entirely" (King, 1991, p. 54). Will the substitution of degradable products for non-degradable ones soothe the solid waste crisis? This article addresses this question by bringing into focus the controversies and realities of solid waste degradation.

Myths and facts surrounding the confusion of materials, waste management, and disposal choices are examined. Included is a discussion of the primary advantages and limitations of degradation as part of an integrated waste disposal minimization program in the context of hospitality operations. The article also is intended to clarify important points on options to, opinions about, and post-use disposition of degradable and non-degradable materials. The overall purpose of the article is to contribute to an understanding of the appropriate place and potential of solid waste degradation in hospitality solid waste control efforts. In today's hospitality industry, as is widely the case throughout the U.S., waste degradation often is overlooked or inadequately considered as a waste management path. Thus through the understanding contributed by such works, future articles on this topic might be capable of greater linkages with hospitality waste degradation programs, programs which are lacking today.

#### BACKGROUND

In many areas of the U.S., litter, bulging landfills, ARDUOUS-to-site waste incinerators, and increasing quantities of solid waste generation are forcing municipalities to take measures to control the solid waste stream. This necessity has led to recycling programs, bottle bills (deposits), packaging restrictions (.e.g., polystyrene bans), disposables surcharges, and especially to steepening fees and restrictions for waste disposal services. Inundated by reports of air and water pollution, environmental consciousness has led to firm resistance to siting new waste facilities ("Not in my back yard," or NIMBY). Similarly, concerns for human health and wildlife habitat, and for the ozone layer, among many others, have spurred rapidly-growing resistance to the presence of certain waste items, especially plastics, in the community. This dramatic change in the public opinion climate is typified by the Arlington, Va. Citizens Clearinghouse for Environmental Action. In 1987, the organization was helping 1700 area interest groups fight contamination problems in their communities. By 1990, they were assisting 7000 groups; an increase of over 400 percent in four years (Painton, 1990, p. 76).

Faced with these threats, costs, and inconveniences, many

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people view the hospitality industry's use of disposables critically as symbolic of the solid waste crisis. The result has been public outcry against business, and particularly against highly visible hospitality industry waste-generating practices, such as the use of disposables in fast food establishments (Allen, 1991, p. B2; Quinton, 1990, p. 36; Schwartz & Miller, 1991, p. 28).

Opportunities for hospitality operators to reduce the quantity of degradable waste going to landfills and incinerators are numerous and far-reaching. From single-use amenities in hotel guest bathrooms (e.g., individual boxed soaps, paper mats), to paper headrest covers on airline seats, to disposable serviceware used for fast food and take-out, possibilities for streamlining the waste stream abound (cf. NRA, 1990, pp. 5-17).

To be responsible, to cope, and to thrive, hospitality operators must rethink wasteful products and practices. Operators also must become knowledgeable about waste reduction techniques, and about characteristics such as degradability that can distinguish post-use paths of materials. As a priority, decision-makers can work to minimize organic garbage disposal needs through attention to landscape, foodservice, and packaging waste generation. This effort should be coupled with the use of durables instead of disposables, and well-tuned recycling programs. In this effort, only informed decision makers are equipped to avoid substituting equally or more harmful products and practices in the interest of applying resource or solid waste management techniques.

Adding to this, Mr. H.H. "Bud" Rusitzky, former President of the National Restaurant Association (NRA), urged hospitality decision-makers to keep up-to-date on the facts and arguments associated with solid waste for three reasons: (1) in order to correct misperceptions regarding the amount and nature of hospitality industry-generated waste; (2) as a basis for implementing socially responsible programs to combat waste in operations; and (3) as knowledge to take the initiative in developing well-balanced solid-waste-disposal plans for local communities (Rusitzky, 1989, p. 4). This article addresses these facts and arguments.

#### DEGRADABLE MATERIALS

Experts agree that we must reduce our dependence on landfilling as a solid waste management option. They propose a hierarchy of integrated approaches; 1) source reduction, 2)

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recycling, including composting, 3) waste-to-energy combustion, and finally, 4) landfilling (EPA, 1989, pp. 3-4). Once source reduction and common product recycling options have been exercised to decrease the quantity of waste entering the waste stream (e.g., aluminum, paperboard), a much-touted suggestion is to turn to degradable materials for packaging and disposables. Theoretically, degradable products will disintegrate after use, thus alleviating the pressure on landfill and incinerator capacity.

Were the answer to solid waste minimization only this

straightforward! Unfortunately, it is NOT. A good starting place to comprehending the misunderstood subject of degradation is to ask probing questions. To express both the potential and the problems of solid waste degradation, this discussion will take its form by responding to the following questions and issues.

1. What do degradation and related terms mean?
2. What do consumers believe about degradation and degradability?
3. How do policy-makers interpret degradability topics?
4. How does degradability fit with the paper-vs.-plastics riddle?
5. Technically speaking, what are other main landfill-vs.-degradation issues and facts?
6. Is degradation an effective use of resources?
7. Are degradable products likely to yield a net reduction in solid waste and related pollution?

#### 1. Coming to Terms

What is solid waste degradability? An understanding of the collection of controversies surrounding solid waste degradation begins with an accurate knowledge of the involved terms and concepts. This section serves as a reference for clarification in subsequent discussions.

A material that is "degradable" is one that is susceptible to decomposition. Degradation of waste materials generally is approached in one or both of two ways; biodegradation, and/or photodegradation. Biodegradation is the process of assimilation or consumption of materials by living organisms, usually bacteria or other microbes. Sometimes biodegradation is called "digestion." A biodegradable waste material is one which is capable of being broken down by microorganisms into simple, stable compounds such as carbon dioxide and water. Photodegradation is the process of being decomposed by the

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action of light. In nature, for the most part, photodegradable materials are those capable of being decomposed via the ultra-violet light in sunlight.

As a part of the above description, the term "decomposition" means simply to decay and break down into component parts or basic elements. Beyond bacteria and sunlight, other means can decompose solid waste. Two examples are hammermilling (pulverizing and shredding), and mechanical-chemical actions (as those used in extracting and recovering from wastes certain valuable metals such as silver).

Degradable waste products typically are organic; materials that contain carbon. The organic fraction of hospitality

waste includes paper and paperboard, food, landscape waste, wood, and strictly speaking, plastic. Most organic compounds are biodegradable, with the exception of most plastics. Although they contain carbon, conventional plastics are not considered biodegradable within a reasonable time frame. For plastic products to decompose naturally, estimates are that the process requires from 100 to 400 years. New specially-formulated plastic products show promise of degradability in specific "bio" or/and "photo" environments in a much shorter time frame.

Defining composting is important because it has a different meaning from the related term, decomposition. Composting is the controlled biological decomposition of organic solid waste in the presence of oxygen (aerobic). Co-composting is the simultaneous composting of two or more different wastes, such as food waste with sewage waste and/or yard waste. Compost, then, is the result of composting. It is the relatively stable outcome of decomposed organic material, often referred to as humus or mulch.

## 2. Public Myth-Understanding

For the most part, the public does not have an understanding of the correct definitions as just presented, a fact that is important to hospitality persons for communications purposes. The NRA has compiled a list of some of the most common questions raised by patrons and the public in regard to foodservices. Prominent among the questions was: "Shouldn't we use only biodegradable products" (Coppess, 1989, p. 21)? As discussed below, the public's understanding and beliefs concerning the meaning, processes, and capacity of solid waste degradation apparently often include important inaccuracies (National Solid..., 1989, p.9).

Many of the inaccuracies associated with waste degradation

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are linked to the course of waste when it is landfilled, and to the quantity of materials, particularly plastics, in the waste stream and in landfills. For example, as will be detailed, landfilling and degradation are not truly compatible waste handling processes. Nonetheless, in the U.S., "we cherish the faith that this process flourishes in every landfill" exclaims Dr. William Rathje (Rathje & Psihoyos, 1991, p. 126).\*

Most people believe that landfills are 20 to 30 percent fast food packaging. The public appears confident that an additional 30 to 40 percent is polystyrene foam and other plastics. Perhaps this is what they perceive in their waste receptacles at home when a liter plastic cola bottle seems to fill the entire container. But these beliefs are "pure illusion" (Rathje & Psihoyos, 1991, p. 118).

In contrast to these convictions, according to Rathje's decade-spanning landfill digs conducted across the U.S., fast food packaging makes up only about one quarter of one percent of the average landfill, NOT 30 percent. Some of this packaging is polystyrene (foam), which in turn, makes up just under one percent (Rathje & Psihoyos, 1991, p. 122). As for total plastics by volume, despite years of repeated (but non-referenced) claims in the press that plastics compose 30 percent of the waste stream, evidence refutes this figure. Based on over 200 samples from 11 dispersed U.S. landfills, Rathje's teams found that plastics comprise closer to 10 percent of total landfill volume; one-third the "conventional wisdom" figure (p. 122).

### 3. Policy Makers Define Degradability

Facing a national refuse bill of 15 billion dollars and climbing, legislators are VERY concerned. In fact, of 28 fundamental problem areas, refuse collection and solid waste disposal were the most frequently-mentioned concerns in a National League of Cities survey of over 1000 mayors and council members (Dye, 1988, p. 321). Rathje and Psihoyos warn that the public's waste-related misconceptions (above) also "divert governments from the real disposal problems" (1991, p. 120). Government officials may share the public's misunderstandings. Degradable products just vanish, don't they? And it's natural. Legislators and bureaucrats appear

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\* Dr. Rathje, an anthropologist at the University of Arizona, has emerged a renowned expert in U.S. landfills and garbage. Rathje excavates landfills of our time around the U.S. as a means to understand modern U.S. civilization (Hughes, 1984, pp. 48-50; Rathje, 1990, p. 36-39).

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to find these misconstrued prospects both attractive and popular. With tight budgets and overloaded disposal sites, more and more policy-makers are grasping at waste degradation as a means to stem the tide of waste. They are imposing mandated degradability standards, and often discouraging the use of, and occasionally banning, non-degradable products such as plastic packaging (Glenn, 1990b, pp. 34-35).

At the federal level, policy makers began in the late 1980's to propose and to pass degradability demands. An early example was H.R. 500, the U.S. Congress' Recyclable Materials Science and Technology Act of 1989. This act directed federal agencies to report to Congress on the feasibility of substituting degradable materials for currently-used nondegradable materials for a variety of federal activities. On the state and local level, degradability definitions by legislatures differ. Nonetheless, their existence is evidence that policy makers recognize the need to state a degradation definition as a precursor to imposing degradability demands for materials use

and non-use.

Examples of degradability definitions can be found in Table I. These definitions are applied in such sweeping regulations as: "all disposable products must be capable of biodegrading in 12 months." Some local municipalities (e.g., in Florida) are mandating that biodegradation must take place within intervals as short as 120 days! Such policies can limit choices and complicate operations for hospitality operators. "Legislation has a lot to do with how we handle waste management" reports George Pfeiffer, an organizer for Marriott's corporate recycling program. "We often are restricted by city and state laws that affect our accounts."

And although few municipalities include funds to support enforcement of the solid waste measures they enact, several have included a meaningful compliance element. For example, an official monitoring the Portland, Oregon, polystyrene ban notified approximately 70 percent of city foodservice owners and retailers that their operations were using contraband containers within months of the ban. Operators were told they had 20 days to change to approved products, or they would face an inspection and fines up to \$250 for a first offense, and twice that for a second violation within the year (Liddle, 1990a, p. 59).

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Table 1

Example	State and Local Definitions of Degradable Material
Degradable	FLORIDA: "Degradable," with respect to any material, means that such material, after being discarded, is capable of decomposing to components other than heavy metals or other toxic substances, after exposure to bacteria, light, or outdoor elements (Florida, SB 1192, Sec. 15[4][a]).
Biodegradable	PORTLAND, OREGON: "Biodegradable" refers to "material capable of being broken down by microorganisms into simple substances or basic elements" (Portland, No. 161573, Sec. f[1]).

Degradable Packaging            MINNEAPOLIS and ST. PAUL, MINNESOTA:  
"Degradable packaging" is "paper or other cellulose-based packaging capable of being decomposed by natural, biological, or biochemical processes" (Minneapolis, Title 10, Chapter 240; St. Paul, Chap. 236. Sec/ 236.02[b]).

Time and Post-Degradation Criteria            NEWARK, N.J.: Newark law states that "degradable packaging" must break down by natural processes into "carbonaceous soil material or water and carbon dioxide, or in the alternate, be capable of otherwise degrading WITHIN 12 MONTHS (emphasis added) of manufacture into fragments that are small relative to the original size, or into particles of a molecular weight that is low when compared to that of the original material. (Newark, N.J., No. 6FF020189, Sec. 2[a]).

Source: American Paper Institute, 1991.

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#### 4. The Paper versus Plastics Face-off

The waste degradation controversy is an impassioned topic within the "paper-versus-plastics" debate. It is not difficult to imagine why confusion, controversy, and confrontation keep the conflict well-heated. The economic stakes for replacement of nondegradable products are enormous. Alone, McDonald's late 1990 decision to phase out polystyrene clamshells in favor of paperboard (in their U.S. restaurants) meant lay-offs and considered plant-closures for plastic container manufacturers. Involved firms are powerful and intent in their efforts to influence the public, degradable product consumers, watchdog organizations, and legislators. And they rarely mince words. Organizations of plastics manufacturers and fabricators such as the Polystyrene Packaging Council, Inc., and the Council on Solid Waste Solutions are quick to call biodegradability a:

"mythical solution... and among the irresponsible knee-jerk quick fixes that are an attack on our economic and environmental well-being" (Foster, 1989, np).

Today the paper-versus-plastics scenario is shifting dramatically, often based on the "promise" of degradability . For example, McDonald's decision to switch from plastic to

paper was based largely on recommendations from the Environmental Defense Fund. EDF's scientists insisted that, unlike plastics, much used paper could be shredded and subsequently composted (King, 1991, p. 50). About McDonald's reversal, a typical opposing opinion called it:

"a perfect example of how radical environmentalism is often an exercise in style over substance. ... When environmentalists ignore science to pursue a feel-good agenda, significant and necessary reform plays second fiddle to populist glitz. And glitz won't save the planet" (Opinion:..., 1990, p. 4B).

The main points of the paper-versus-plastics controversy are included in the upcoming discussion of issues and facts. In addition to these arguments, other studies raise questions as to important industry and resource aspects. For example, a German research firm's 1988 study found that the parameters of packaging materials in the absence of plastics would increase in weight by fourfold, and in volume be twofold. Energy consumption for packaging products likewise would double. In comparison to paperboard, polystyrene (foam) requires no trees, takes less energy to produce, deposits less water-borne waste during disposal, and burns cleaner

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than paperboard. And don't forget, says Jan Beyea, staff scientist of the National Audubon Society: the chlorine bleach and the sulfur emissions placed in water and air resources in the paper production process (Rathje & Psihoyos, 1991, p. 122).

Persuasive arguments notwithstanding, beware some who defend and even praise plastic packaging and other plastics with too much enthusiasm. Their presentations also can go too far, offer vague dialogue, and highlight half-truths. For example, one spokesman for AMOCO (a large manufacturer of plastic packaging for food), insists that, "It only makes sense to enrich our waste stream with MORE polystyrene" (emphasis added) (Beck et al, 1989, p. 69)! But recall that one of the main reasons for McDonald's switch was their disappointment in the infrastructure for recycling plastics. Inadequate public and private collectors, processors, and recycled product markets crippled their efforts to roll-out an effective plastics recycling program even on a regional basis (Liddle, 1990b, p. 110). Overall to this time, plastics recycling programs have been unconvincing in realizing the potential of recycling recoverable material. The reality is, like degradable materials, most plastics, recyclable or not, are not recycled, but take a one-way trip to a disposal facility. Zealous pro-plastics advocates simply would have the public believe otherwise.

5. Main Degradation Issues: Unearthing the Facts

Investigators say that nearly three-fourths of landfill waste is organic; thus the potential for reducing waste through decomposition is enormous. But degradability is not a magic bullet, as many believe it to be. "It's a false promise" cautions garbologist Dr. Rathje. The upcoming segments set out facts in response to the public's mythical trust that degradability is today's solution to solid waste problems. The public's arguments in this respect appear to be based on these fundamental but faulty assumptions:

- A) most degradable waste is degraded (e.g., is composted),
- B) extensive degradation actually occurs in modern landfills and
- C) degradation in landfills would not pose substantial environmental threats.

A - Most Degradable Waste is NOT Degraded: Although the public believes that most degradable waste is degraded or composted, this comforting idea lies far from the truth. To

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clarify the misunderstanding, examine the simple but important distinction between the terms degradable and degraded. A degradable material is susceptible to breaking down to component elements, given the appropriate environment and time. Ah...but a material that is degraded must have (had) the opportunity to degrade! At this time in the U.S., most degradable municipal solid waste never gets a chance to degrade. Eighty to eighty-five percent goes directly to be landfilled, and about ten percent is incinerated. As of 1990, only seven U.S. facilities were in operation devoted to degrading or composting the main organic fractions of a community's waste stream (Glenn, 1990a, p. 50).

Thus, assuring that packaging or other disposed material is degradable, then equating that quality with the notion that the material WILL be degraded and vanish as a public nuisance, rarely is more than wishful thinking. Given current U.S. waste practices, a material labeled as bio or photodegradable is like a car that is promoted as "able to cruise at 200 mph." The separate product claims of degradability and speed have in common that they offer a promise some consumers value. Chances are, however, that few consumers will see that either capability is put to the test. Engineering, intent, and marketing proclamation; they are all meaningless if the waste material takes its most probable route to disposal; to the incinerator or landfill.

"Biodegradable". "Photodegradable". These terms still entice and console, but they also can be misleading in the presence of high emotions, inaccurate understanding, and a "hype"-oriented media. The situation is not unlike the presence of descriptors like "light" on a food label.

Consumers appear to interpret "light" as whatever health-enhancing virtue they fancy, almost resisting facts. But knowledgeable consumers are aware of the margins of truth in such proclamations. Some state and local governments are taking action to protect consumers. As an example, seven state Attorneys General brought suit against Mobile Oil Co., charging that their "Biodegradable" claim on Hefty garbage bag packaging was misleading and virtually worthless, since even under ideal conditions, only 10 percent of the bag's content is prone to degrade. The Federal Trade Commission has acknowledged concern, and momentum is gathering for their intervention. Meanwhile, sellers exploit the virtuous interpretations that consumers often ascribe to the degradable claim (Smith, 1991).

B - Degradation: A Myth for Modern Landfills. The public seems convinced that "we can rely on trash decomposing rapidly in landfills" (Rathje & Psihoyos, 1991, p. 118). The

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question of waste disintegrating within a landfill is an important one, since over four-fifths of all residential and commercial solid waste goes into them. The question to pose, then is: since the EPA reports that 70 percent of landfill waste reportedly is photo or biodegradable, why are so many landfills closing or near closure?

The reply to the above is: precious little bio or photo degradation can take place in our civilization's landfills. Thus a major aspect of the false promise contained in the public's view of degradability is that landfills are not compost facilities. Without oxygen and appropriate treatment, degradation not only is not enhanced, it is inhibited. It is more like mummification than composting. In landfills, none of the requirements of degradation are at hand. Refuse rarely is shredded or hammermilled. Deliberate addition of fluids into fills is prohibited as a means to reduce leachate. Aeration intentionally is minimized by a frequent covering of earth, and rotation is virtually non-existent. In referring to claims of degradation in landfills, James Noble of Tufts University's Center for Environmental Management exclaims, "it is not surprising that everything doesn't biodegrade rapidly; the miracle is that anything biodegrades at all!" (Rathje & Psihoyos, 1991, p. 126).

Again, the misplaced expectation that landfill waste will vanish if we use degradable products has been discredited largely through the landfill excavation efforts of Dr. Rathje and his associates. Among countless items of evidence to the contrary are legible copies of newspapers buried for 40 years without significant degradation. His team found fifteen year old steaks with the fat intact, tree leaves from 1964, and lumber from 1952. And hot dogs? From 1972 - in fine condition; "Their preservatives really work!" exclaims

Rathje (Rathje & Psihoyos, 1991, pp. 123, 126).

Similarly, even the much-touted new biodegradable plastics will not be the landfill packaging panacea. Given that 10 percent of landfill volume is plastics, it would figure that degradable plastics could have a noticeable impact on their rate of fill. However, the EPA reports that, "while degradable plastics may prove to be effective above ground; ...enhanced degradability will have little if any effect on landfills" (Dziezak, 1990, p. 100).

C. Degradability and Landfill Safety: Biodegradable products, if composted, have obvious and needed advantages. But especially given today's solid waste paths, dangers and compromises need to be recognized. One danger of degradation

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is increased hazardous or toxic pollution (Epstein & Epstein, 1986, p. 50). When degradable products DO reach landfills, they are not inert, whereas non-biodegradable materials are stable. Some degradable products undergo partial breakdown in landfills, releasing substances which then become part of hazardous landfill leachates.

A relatively small quantity of a contaminate is sufficient to render extensive environmental damage. For example, a single gallon of gasoline can contaminate a million gallons of water (Doyle, 1987, p. 26). Typical degradable cleaning agents, paper, and plastic products that hospitality organizations may be persuaded (or restricted) into adopting may contain potentially hazardous elements. The presence of potentially toxic and carcinogenic compounds leaching from packaging garbage has been well-documented (Harper & Pohland, 1988, p. 66; Rathje, 1984, p. 23; Rathje & Psihoyos, 1991, p. 128-130). For example, toxins including lead, cadmium, mercury, hexavalent chromium, arsenic, and hazardous plastics polymers can leach into solution from degradable products via seeping solvent agents like rain and garbage moisture. In improperly lined landfills (the majority), these leachates can percolate through the fill, eventually contaminating ground water beneath it.

The leachate relationship to degradable plastics was elaborated upon by Mr. Woo Young Lee, director of R&D for Mobile Chemical Company (maker of one fourth of the nation's annual 25 billion plastic grocery sacks):

As we make plastics more degradable, the probability for pollution [in the form of toxic substances] increases due to higher heavy metal contents.

Summarizing the puzzle, the EPA notes that, while natural degradation is desirable for food and yard waste:

...it is unclear that degradation of organic manufactured products is in itself a desirable feature because some of the resultant products can be toxic compounds that are potentially undesirable if they are not managed properly (NRA, 1989, p. 14).

#### 6. Should Degradation and Recycling Co-exist?

Degradation and recycling can be compatible partners in an integrated waste control program. However, if they compete

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for the same materials, degradation and even degradability can defeat the objectives of a hospitality operation's recycling program because the two can conflict in nettlesome ways. Again, Mobile Chemical Co.'s Mr. Lee explains:

As we make our products more degradable, it will be more difficult to recycle them. As you make it more degradable, you have to compromise long-term stability. So as a recyclable component, this is not desirable.

The desirability of degradability raises vexing questions of effective resource use when compared to recycling. While both recycling/recovery and degradation are recommended for minimizing lasting waste disposal volume, recycling may be a superior path for many disposed products, rather than decomposing them into humus. In addition to a reduction in waste disposal needs, an objective of recycling is recovery of material resources in an intact form (as opposed to a decomposed form). Organic products such as waste paper and food waste could be used to provide resources (e.g., recycled paper and swine feed, respectively) that would offset some of the need to harvest new raw materials, and could result in products in greater demand than humus.

Hospitality operators can be caught by this dilemma. Says Marriott's Pfeiffer, in many accounts, "executive orders or enacted legislation prohibits the use of such (recyclable plastic) products in favor of what some government officials believe to be more environmentally friendly." For many, such circumstances mean that polystyrene use and, thus, its recycling are not options in many accounts (particularly not in government accounts) (King, 1991, p. 53). Dr. Tom Nosker, a researcher at Rutgers University Center for Plastics Recycling Research in New Jersey, adds to Pfeiffer's lament:

There are a lot of politicians out there who'll go down in history as having overreacted. Go to Newark, and see what restaurants are using for food packaging. They're using polyethylene-coated

paper. It's not degradable OR recyclable (Holmes, 1991, p. 39).

A similar degradation versus recovery conflict is legislators' and manufacturers' recent propensity to favor water-based, rather than oil-based substances, for use in adding text, graphics, and coloration to degradable products. While theoretically oil-based products could be separated from water, water-based products offer no such extraction

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potential. The bottom-line irony in this struggle is that banning recyclable materials, including polystyrene, can discourage and limit the more resource-efficient option of recycling.

#### 7. Degradable products as part of the solid waste solution.

Undoubtedly, degrading degradable products such as food and landscape waste will be an important part of the solid waste management effort for the hospitality industry. Probing their current contribution to the net reduction in solid waste and related pollution, however, illustrates that we have a long way to go before degradability automatically can be considered an effective weapon to alleviate solid waste quantities.

One concern is that degradability as a potential seems to provide some policy-makers with the illusion of problem resolution. For example in a net gain analysis of landfill waste, we would learn that merely substituting degradable products for non-degradable ones has not yet made a difference to the quantities dumped. It only changes the composition of materials discarded. In this respect, as a strategy for integrated waste management, the thoughtless substitution of degradables is a mistaken route. Another limitation is that substitution does nothing to discourage the throw-away behavior that underlies the solid waste and landfill crises. We simply substitute what materials we discard.

Finally, since litter is a part of the "net gain" analysis, a serious but strangely-humorous concern relating the hospitality industry and degradability revolves around this phenomenon. The litter concern should be of notable interest to fast food operators, who may be targets of solid waste-related blame partially because of litter that happens to bear their logo. According to the Keep America Beautiful Foundation, consumers tend to view degradable products as advantageous to the environment. Thus the concern is that, with degradable disposables, naive consumers actually may be more than ever inclined to toss them into the landscape. It is easy to picture millions littering under the mistaken rationale that they are thus benefiting nature; e.g., If I toss this paper cup into the forest, it will help fertilize

it!

## CONCLUSION

The responsible and effective management of hospitality solid waste requires an awareness of all the main components of an

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integrated approach to waste minimization and control, including waste degradation. Material degradation can be a highly technical subject. Little consensus exists concerning safety, technical, social, or economic aspects. Though it is not possible to devise a simple, factual statement of the desirability, value, and feasibility of solid waste degradation as a waste management technique, it is essential to identify major controversies and compromises associated with waste degradation. An objective look at any main argument for or against degradability nearly always traces back to one or more of the issues raised in this paper.

As the pendulum swings in the direction of the desirability of degradables and degradation, the need is growing for hospitality operators to be knowledgeable when incorporating degradable products into hospitality operations, and when disposing of degradable materials. This article has focused on prominent issues surrounding degradable products. In examining opposing views to degradability trends, one also can see the possibility that the public and legislative pendulum could swing away from the current approaches to degradation for waste control in the future.

Hospitality industry decisions on whether, when, and how to use degradable packaging and other degradable products must take into account the interrelated nature of many forms of pollution. To the extent of our knowledge and capability, decisions and programs to decrease one pollutant should not increase an equally or more noxious pollutant (Meier, 1985, p. 171).

Finally, the public and policy-makers must hear from the hospitality industry to offset the current narrow, naive thinking that using degradable products and/or substituting them for nondegradable ones, automatically results in a net reduction of solid waste and related pollution. The most critical need is that hospitality operators bring to these discussions and decisions a broad and informed view of waste degradability, and a willingness to seek and to apply meaningful solid waste strategies.

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