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Unrolling the Roll: Toilet Paper as a Socially Constructed Symbolic Artifact

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Unrolling the Roll

Toilet Paper as a Socially Constructed Symbolic Artifact

Elizabeth Edgardo

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April 26, 2013

Thesis submitted in partial fulfillment of the requirements for a major in the program in Science,
Technology and Society (STS)

Mom, just thanks.

Papa, thanks for all the opportunities you gave me to travel. I might never have noticed toilet paper otherwise.

Professor Challey, thank you for introducing me to SCOT and to the existence of quirky stories about technology and science.

JGray, thanks for trusting me to make toilet paper academic and for looking after me in general.

M, thank you for your unflagging enthusiasm, encouragement and support in all things, for teaching me to let my subconscious do its thing, and for treating me as a friend.

Lucy, thank you for the joy you bring to learning in the field and in the classroom.

Fellow Majors and department faculty, thank you for making the thesis presentations enjoyable! I didn't cry like they show in the movies.

Friends and family, thanks you for inspiring some of my thoughts and anecdotes, and for listening to me talk about things that made you uncomfortable.

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INTRODUCTION

I spent 15 weeks in Mongolia last spring. Toilet paper was available sometimes. We used the tissue when we could, but if we had none with which to wipe it was a non-issue. That is the way life goes over there: toilet paper is not essential for a comfortable life.

My Mongolian bathroom experiences contrasted with those I had had in America from which I learned the unquestionable necessity of using toilet paper in the bathroom. A particularly strong memory is of a housemate (who shall remain anonymous) my mom and I had sharing our home for a few years: she never had any less than three thirty-six count packs of toilet tissue “just in case something happens”. I never did find out what that “something” might be.

In any case, I noticed that my relationship with toilet paper changed depending on the discrete location in which I was situated at any moment. TP is not a given. Neither is it a necessity. It is a tool that people designed, manufactured, advertised, sold, bought, and used to a degree of success that allows it to remain well-stocked on store shelves and in bathroom cabinets today. Toilet paper is not a prerequisite for life, yet it has become deeply imbedded into our daily practices, at least as Americans if not for most humans, to the point where we assume its existence. We don't notice toilet paper unless it's gone, and people have made it so.

ASSUMPTIONS

"But I NEED toilet paper"

There have been people in my life who refuse to relieve themselves unless they have access to toilet paper or at the very least a facial tissue. They will keep themselves in a state I would call agony because as they see it there is one alternative to wiping after peeing and pooping: not peeing or pooping at all. My horizons were broadened during my time in the Mongolian countryside.

Sometimes there was toilet paper, and sometimes there was not, but toilet paper was neither a cause for celebration nor for despair. I do not need to wipe after I pee; contrary to my earlier imagination there is never so much urine hanging around to actually leak through my pants. Neither do I need plush, absorbent toilet paper to clean myself after I poop; rocks work well.

“Wiping-ness is close to Godliness”

How many times did I wipe once and then again just to make sure? Take more toilet paper off the roll than I really needed for that extra security? Too many times to count. I have grown up with the faith that toilet paper will make my behind clean, but people of other cultures do not hold the same truth claim regarding bathroom hygiene.

Some European cultures utilize the bidet to wash after using the toilet. More recently this has been adapted into a paperless toilet-bidet hybrid (the Toto) by Japanese engineers in 1999. “The device washes, rinses and blow-dries the user's bottom with a heating element” while he or she remains seated upon the toilet (Wolf). Modern Plumbing on the Berlin Turnpike in Connecticut had a Toto installed in their women’s bathroom, and I would drop in on my way to the movies. It certainly was different to be washed without having first stepped into a shower.

In India the normal post-potty practice is to wash with water, although people in that country use their hands instead of a pressurized jet. My dear friend Sandy regularly teaches at a school in the northeastern mountains in India, and a colleague admitted his confusion about the regular use of toilet paper. “Water cleanses,” he said. “When you want to clean your whole body is it enough to wipe it with a dry paper towel?” Sandy’s answer to that question was, “No”, as is mine.

There is a double standard surrounding American hygienic practices in that a more thorough washing is expected for our entire bodies while the area we consider to be the dirtiest is served well enough with a wipe of dry paper material. The American concept of cleanliness is characterized by separation from our body's eliminations. We don't need soap and water as long as we don't have to touch it, right? Right?

"That does not belong in a trash can, Honey"

A large part of toilet paper's character of cleanliness from how it is disposed of. Flushing human waste into a sewer system keeps microbes within a more controlled environment as it is channeled to a treatment plant to be digested and purified. Flushing toilet paper along with the body's eliminations tells us that, once used, TP is considered to be as dirty as the feces it was used to wipe and must also be handled inside the closed system of sewage pipes.

When asked what it would mean if he woke up tomorrow in a world where no one flushed toilet paper, Franco Zani, Superintendent of Sewers for the Town of Poughkeepsie, fantasized, "My maintenance labor and maintenance costs would be cut by a third." Zani recognizes potential benefits of not flushing TP, however he does not advocate for people to simply throw used toilet paper into a trash bin for fear of allowing the spread of airborne pathogens that escape from our gut through our feces.

But what if every house had its own little plug-in mini-incinerator in the bathroom expressly for burning soiled toilet tissue? Are there dangerous thermophilic pathogens that would live through the extreme heat? Would the ashes be good for compost? Would the electricity used be more of an ecological detriment than the electricity spent pulverizing the paper at the treatment plant? Is it okay to add another fire hazard into households? Would individuals be willing to put in the extra effort of burning their paper when flushing is just so much easier?

Flushing is an easy waste disposal method, yet myriad countries that utilize both toilet paper and flushing toilets (eg: Mongolia, China, Mexico, Morocco) have as a societal rule that used toilet tissue is to be thrown away, never flushed. Zani explained that the difference in toilet paper practice is due to our nation's commitment to sewer maintenance. The primary bar filter at the Arlington Sewage Treatment Plant must be raked out every two hours to keep it clear of huge toilet paper boluses that aggregate in the pipes as they flow along, and each of the fifty-three pump stations in Arlington must be cleaned of the potentially jamming settled materials (yep – toilet paper) at least once a month. Routine cleaning demands manpower, time, energy, equipment, and expense, and some countries do not see that effort as a municipal priority. But America does (Zani).

Why is the ability to flush toilet paper so valuable? To answer this question I will follow the contemporary evolution of the sewage system, indoor plumbing, and

toilet paper in America and try to identify if and how the various technologies affected the development of one another.

HISTORIES

Toilet paper developed as a technology starting in the mid 1800s. It was not, however, conceived of as the unquestionable necessity most Americans view it to be today. The appearance of toilet paper in the American consumer market coincided with the development of other household/public technologies.

Plumbing History

American metropolitan areas began to explode in the 1840s, and while they grew they were outfitted with plumbing systems with the original purpose of distributing water only. The very first pipes, made of hollow logs, were intended to facilitate extinguishing fires throughout the city proper. This basic system was then extended directly into homes, tenements, and businesses. The new efficiency and convenience afforded to people by directly piped-in water led to an exponential increase in water use which, in turn, created a lot more waste water to be disposed of.

Initially the extra water was drained into public cesspools (Figure 1), but those receptacles were never designed to handle the volume of dirty water actually produced and, overwhelmed, they began to leak into the well systems and overflow into the streets. The average citizen only added to the sanitation problem: if the cesspools were backed up they would dump their chamber pots directly

onto the street (Schladweiler). It didn't take long for people to become sick of the stench.

The Rise of the Professional Plumber

Wealthier homeowners, blessed with leisure time and resources, began engineering their own private sewers to ensure their waste water was contained and kept separate from their well water. Civil engineering would not become a concept or school until the 1850s, however, so these industrious members of the gentry undertook their projects without being particularly trained to do so.

Despite their (self-serving) efforts to contain human waste the privately constructed sewer systems, like cesspools, were not leak proof; their contents leached underground and into the drainage system. Furthermore excrement and garbage both continued to litter American urban areas due to the cultural habit of tossing leftover food, chamber pot contents, and washing water into the streets (Schladweiler). It was time for the government to serve the people.

At first city governments created policies in order to eliminate the unsanitary conditions. In 1850 the city of Boston, for example, willingly took over managing the poorly privately constructed sewers:

“As the law now stands, any proprietor of land may lay out streets at such level as he may deem to be for his immediate interest, without municipal interference; and when they have been covered with houses and a large population are suffering the deplorable consequences of effective sewerage, the Board of Health is called

upon to accept them and assume the responsibility of applying a remedy” (Schladweiler).

Philadelphia was the first city to mandate that every home be connected to a waste sewer with a “house lateral” in 1857:

“There should be a culvert on every street, and every house should be obliged to deliver into it, by underground channels, all ordure or refuse that is susceptible of being diluted. The great advantage in the introduction of lateral culverts is not only that the underground drainage from adjacent houses should be generally adopted, but that by the construction of frequent inlet, our gutters would cease to be reservoirs of filth and garbage , breeding disease and contagion in our very midst” (Schladweiler).

Government leaders were beginning to recognize the connection between water quality, waste disposal, sanitation, sewerage and public health and to view those as responsibilities for them to manage.

Germs were officially discovered and explored during the 1870s bolstering previous actions made to contain human waste within sewer pipes. Germ theory was taking hold and boosting the popularity of cleanliness, bathing, and water contamination prevention in American society. “The nature of ground water was studied, as were drainage, sewage, water supply, waste disposal and location...” (“History of

Plumbing...”). Governments continued to make efficient excrement disposal a priority.

In the early 1880s American municipalities moved on from just writing policy to actively installing community sewers. Public sewer systems were first developed in Chicago, Milwaukee, Brooklyn, Washington DC, Buffalo, and Philadelphia, but not without their share of mishaps. Civil/sanitary engineering was still an infant discipline. There was neither any official training for engineers nor any precedent of design standard, so many of the engineering lessons learned were taught by the school of hard knocks as novices tinkered with the materials they had at hand.

As they continued, the early builders of the underground sewer system developed the technical trade of plumbing. Their successes and mistakes became the basis for new college courses in civil engineering. They also were able to gain respect for the profession through their work. “Prior to the 1890s, the U.S. Commerce Dept. lumped plumbers together with gas fitters and other metal working categories. The engineering community likewise tended to ignore this unglamorous specialty” (Olszynski). The integral role plumbers and sanitation engineers played in improving public health raised the status of their initially discounted line of work from dirty and distasteful to respected and appreciated. “The plumber, long vilified in early years, saw his status upgraded to that of the Sanitarians [sic]” (“History of Plumbing...”). The majority of their

work being underground, however, helps the public to quickly render sanitation engineers invisible.

The Tricks of the Trade

The early sewer engineers had quite a few design choices to make. Some were particular to location and weather conditions like deciding whether a combined system (storm water and waste water run through the same pipes) or separate system (storm water and waste water run through dedicated pipes) is most appropriate to install. Other choices were good ideas in every installation site like building regularly spaced manholes to provide access for maintenance and cleaning as well as allowing sewer gases to ventilate (Schladweiler).

The engineers also had to figure out the best materials for building underground sewer pipes. The hollow logs normally used to construct pipes for water distribution required more frequent repair than they were interested in accommodating, so brick sewers were the norm for a while. In 1885 Washington D.C. was the first US city to install concrete sewer mains in 1885, but even so the pipes were fully lined with brick or clay tiles.

Brick construction was ill-suited to sewers for a couple reasons. Firstly, corrosive acids quickly eroded the mortar which translated into frequent repairs. Secondly, the rough surface of brick increased the friction exerted on the sewage undesirably causing it to flow more slowly within the pipes. The technique of brick construction remained for another 75-80 years until the

benefits of both smooth sewer interiors and the manufacture of higher quality concrete were realized (Schladweiler).

A quote from Colonel George E. Waring, American sanitary engineer and advocate of sewer systems that kept domestic sewage and storm runoff separate (1880s):

“Any roughness of surface, as in even the best made cement pipes, tends to catch hair and lint, and thus to form nuclei from accumulating obstructions, sometimes so hard they can be removed only by forcible, mechanical means The material of the pipe should be a hard vitreous substance – not porous, since this would lead to the absorptions of the impure contents of the drain; would have less actual strength to resist pressure; would be more affected by frost or by the formation of crystals in connection with certain chemical combinations, or would be susceptible to the chemical action of the constituents of sewage Much experience with cement sewer pipe seems to demonstrate that they are not sufficiently uniform in quality, nor sufficiently strong and durable, to be used with confidence in any important work, whether public or private. Sewer pipes should be salt-glazed, as this requires them to be subjected to a much more intense heat than is needed for “slip” glazing, and thus secures a harder material” (Schladweiler).

Improvements continued to be made and brought us to where we are now. Presently, the smaller sewer pipes are still made of vitrified clay as it is smooth and resists clogging and abrasion, while the larger pipes are cast concrete since concrete is cheaper and stronger than the clay. Both materials, however, are brittle and need to be properly bedded. The American sewer system is comprised of house laterals that lead to submains that lead to larger mains that empty into even larger mains and trunk and interceptors – much like the pattern of streams in nature. The sewerage in the US is also installed at a slope of 50 feet per mile (increased when the sewer is forced into a turn) to maintain a sewage flow speed of 2-3 feet per second (Hayes 62-63).

Plumbing Makes the Toilet a Fixture

Since homes and buildings in cities and larger towns were all equipped with outlets leading to underground sewers the presence of indoor bathrooms outfitted with a sink, tub, and toilet grew from the 1920s on. Between 1929 and 1954, “...sales by distributors of plumbing products and heating equipment rose from \$498 million to \$2.33 billion, a whopping 367% increase” (“History of Plumbing...”).

So due to an increase in water distribution plumbing, waste water, and awareness of the link between disease and irresponsible waste management in an urban setting, reliable and accessible sewage systems were constructed in America – first in the cities and then in the suburbs as they were built in the mid-20th century. Sewer hook-ups in every home and public building gave the

occupants the capacity (or some might argue the impetus) to install bathroom and kitchen fixtures indoors.

The reader may be wondering why I have spent time researching and writing about plumbing in a paper that is supposed to be about toilet paper. On one level it is to demonstrate how the system in which toilet paper functions came into being. On a second, deeper level it is to draw your attention to invisibility. People, governments, communities in early America first focused on the distribution of clean water and then found themselves needing a system to effectively remove the water once it was dirtied. Their answer was to build closed, contained, underground sewer systems into which individuals could dispose of their waste in an invisible, discrete way from the privacy of their own home.

Enter TOILET.

Toilet History

Humans have been depositing waste into constructed water channels since the days of the Roman Empire, relying on the running current to cleanse the toilet sites and carry any undesired material downstream. The first flush toilet equipped with its' own water closet ever recorded was built by Sir John Harrington as a gift to his godmother, Queen Elizabeth I in 1596. It was neither considered a practical technology nor did it catch on in society because the flush mechanism was startlingly noisy and the sewer gases were allowed to rise up out of the pipes below deterring the Queen from ever depositing into the

toilet herself (“A Brief...”). Thus when North America was colonized the bathroom habits of the colonists remained similar to those of the average English population at the time: either relieve yourself outside or make use of a chamber pot and dump it out into the street with the garbage later (“History of Plumbing...”).

During the period of American urbanization starting in the 1840s Americans primarily used chamber pots and cesspools as receptacles for their personal waste, and that practice could have continued through to the present time – engineers could have built a better cesspool. The flush toilet, however large its first flop, did not die out in Queen Elizabeth’s personal chambers. Individuals kept working on improving toilet design.

“Throughout the 1700s and 1800s, tinkers came up with contraptions that could be called flush toilets, and hundreds of patents were issued for these devices in Britain and America. From time to time an intrepid homeowner would attempt to surpass the Joneses by acquiring one of those primitive toilets and moving his outhouse indoors. But these early attempts at modern plumbing were more foolish than innovative. Closets of the era were unsanitary Rube Goldberg contraptions made of poorly fitting metal and wooden parts. They contained ledges and crevices that tended to collect waste. They stunk to high heaven, and most failed to operate as envisioned because of shortcomings in system design as

a whole. Their main benefit was to discourage house guests” (Olsztynski).

The water distribution system installed in urban areas in the 1840s and 1850s took the brakes off of water use, and sanitary sewers provided an outlet for waste water. Functional indoor flushing toilets with their own water tank were becoming more of a possibility if only plumbing fixtures could be reworked so that the stench from open sewer connections were not allowed to waft back into the home making a supposed-to-be haven uninhabitable. The fumes were smelly, and they were combustible (“History of Plumbing...”).

An initial solution to the odiferous problem was to vent the toilet gases out a pipe through the roof, but, through much trial and error, this solution proved to be tricky : if the pipe was too small it would clog with frost in the winter. In 1874, a plumber of unknown identity solved the venting problem by balancing the air pressure in the system with the outside atmospheric pressure to prevent the water seal in the traps from being broken. This modification involved increasing the size of the pipe used at the traps and eventually designing toilet pipes in an “S” shape (“History of Plumbing...”).

The US patent office received over 350 applications for various water-closet designs between 1875 and 1925 touching on everything from flush mechanism to toilet material. As toilet technology improved and proliferated at the same time sanitation engineers were literally smoothing the kinks out of sewer pipes.

The culture of urban America shifted away from chamber pots and out-the-window disposal toward unseen underground sewage systems (“A Brief...”). Homeowners were eager to buy functional, trustworthy toilets and hook them up to the sewer laterals. In this way toilets continued the work of the sewer system in that it further separated people from their waste making it more invisible to the individual: rather than dumping out a chamber pot which one could look into or smell or spill in the process, one can simply flush without ever looking into the toilet bowl.

At first indoor bathrooms were shared communally. Not only was this following the style of neighborhood privies (usually planks of wood over a cesspool, a gap left to stand/squat over), but before household plumbing, toilet (read: hygiene) activities were portable. The chamber pot, wash stand, and wash tub were personal/family belongings that could be moved from room to room in the house to be used where it would be most convenient. Ladies used chamber pots in the parlor while sewing with their friends, spouses relieved themselves in the bedroom in the middle of the night, and family members took baths in the kitchen where the bathing water was most easily heated. People were not bashful about sharing these new facilities (“A Brief...”). As time went on, however, the improved toilet and sewer technologies ushered in a new concept of privacy.

Not until indoor plumbing was improved did permanent water closets (and baths and washstands) gain acceptance. Not until permanent indoor toilets were accepted did bathrooms become a dedicated space. This emerging trend in

home construction began to grow late in the 19th century,”... and by the 1920s American building codes required indoor bathrooms in all new single-family residential construction” (“A Brief...”). The dedicated space dictated by plumbing fixtures was becoming an increasingly private space to be shared only by relatives and house guests, and hopefully not at the same time!

Needs for personal and urban hygiene, advances in various technologies (plumbing, sewer, flushing mechanisms, heating, ventilation, etc.), and shifts in cultural standards and knowledge all converged to promote the installation of convenient, comfortable household bathrooms. In response to the creation of this designated space, American “...attitudes toward privacy and modesty changed significantly. What were once communal and family activities [became] very personal and private activities. Whereas once single bathrooms served several families in urban apartment houses, now it is not unusual, nor even considered particularly extravagant, for households to have a bathroom for every bedroom” (“A Brief...”). Bathrooms may even be constructed with a sliding “pocket door” to provide an additional barrier between the person on the toilet and possible intruders (Figure 2).

A quick example to illustrate the increased sense of privacy in American society today:

I grew up in a house with just my mom. More often than not she is running late, and there is always some sort of mad scramble for the both of us to get ready and out the door together.

All of the following is yelled:

“What are you doing?!?!”

“Getting into the shower!”

“But I need to take a shower!”

“Well I’m taking one now!”

“You’re supposed to take a shower before me!”

“Says who?!?!?!”

“You ALWAYS take a shower before me!”

“Then just take a shower after I’m done!”

“We don’t have TIME for two showers!!!!”

“WELL?!?!”

The answer to that question is for both of us to take a shower at the same time. Whenever this time-saving trick comes up in conversation someone will always try to give me the benefit of the doubt and help explain the rationale behind the choice:

Friend: **“Well, I mean, like how old were you?”**

Me: **“Umm...we had to do it last week before that birthday party.”**

Friend: *(laughs uncomfortably)* **Aren’t you a little...OLD to still to that?”**

You are never too old to save time.

TP History

As I have brought up before, humans have always wiped after eliminating their bodily wastes; they just haven't always used paper to do so. In the past anything worked: grass, mussel shells, leaves, lace, wool, moss, handfuls of snow, sponges, stones....anything ("History of Toilet..."). For a more comprehensive list, check out the appendix

Here in America, the original colonists used many of those natural materials to clean themselves as well as newspaper if they had purchased one to read earlier. As the nation expanded, the wiping repertoire out west grew to include corn cobs and pages from both the Farmer's Almanac (manufactured with a hole in the corner so it could be conveniently hung from a nail on the outhouse wall) and the Sears-Roebuck catalogue (lovingly referred to as the "Rears and Sorebutt" catalogue) ("History of Toilet..."). So how did toilet paper become the unquestioned bathroom tool it is today?

Making Paper

Toilet paper's American story begins in 1690 with the opening of the first American paper mill by Wilhelm Rittenhausen in Philadelphia. At that time, paper was made out of old rags. Cotton or linen cloth was boiled, beaten into a pulp, and pressed and dried into a form. Any paper produced was used

expressly for writing; colonial Americans used corncobs and leaves to wipe their rears, and then newspapers as they became available (“Toilet Paper...”).

As the paper industry grew in America the mills found themselves without enough recycled rags to meet the demand for paper. In 1791 the Second Congress of the United States even passed a resolution in petitioning all citizens to donate rags to keep the industry functioning. The Crane Paper Company, a small one vat mill that produced 2,500 sheets of paper daily, ran its first newspaper ad in 1801 asking ladies to save their rags for commercial papermaking. The 1810 US census reported 179 working paper mills across 17 states, but the domestic supply of rags was still not sufficient to meet demands for paper. European papermakers flooded the American market with rags to sell to the mills and paper to sell directly to consumers making high profits for themselves and taxing the US paper industry (“Toilet Paper...”).

Fortunately various inventive individuals had been working on an alternative to rag-pulp paper. As early as 1716 plant materials like hemp were used experimentally as raw materials for paper, and American Matthias Hoop wrote a treatise on making paper from leaves, straw, and other vegetable products in 1800. It was not until 1840, however, that a mechanical process for making wood pulp (called “groundwood”) was developed, and then not until 1854 was that hard, woody paper first used as a supplement to the supply of rags. The combination of groundwood and rag pulp produced paper appropriate for the functions it served at that time: parchment, newsprint, money. Paper made

purely of groundwood was not practical because the wood did not undergo any significant chemical change during processing and dried it into rigid sheets of paper with large coarse fibers (“Toilet Paper...”).

Through the late 19th century and early 20th century new chemical processes were developed to create finer paper from wood fibers. First was the Sulfite Pulping Process invented in 1866 by American Benjamin Tilghman. His process used sulfurous acid to dissolve the lignin¹ in the groundwood leaving behind nothing but cellulose fibers which are softer and easier to bleach than regular groundwood making them more appropriate for use in tissues and elegant stationary. The Sulfite Process was not commercially accepted until 1890 in America (Sweden began it in 1874) (“Toilet Paper...”).

The second new process used in America was the Soda Process during which wood chips were cooked in a caustic soda solution – a much more effective treatment for short-fibered hard woods like aspen and elm. The Soda Process yields pulp with lower tear strength, so it was mixed with sulfite processed pulp as a supplement to make printing papers. Soda pulp mills began to appear in America in 1900 (“Toilet Paper...”).

In 1883 Carl Dahl, a German inventor, developed a third way to make softer groundwood. He found that a very strong pulp resulted when he added sodium sulfate to the caustic Soda Process, and he named it the “Kraft Process” as

¹ Lignin is a key component of the second cell wall of a plant cell. Somewhat liquid-like, it fills in gaps and provides structural stability (“lignin”).

“kraft” means “strong” in German. This process is best used to treat long-fibered woods like pine – the predominant forest species in America. The American paper industry implemented the Sulfate Pulping Process in 1910, and the United States was able to become a major paper product manufacturer since it no longer needed to import wood pulp from Canada. As a result of these technological paper-processing developments many paper mills in the United States converted from cotton fibers to wood pulp (“Toilet Paper...”). People would find many applications for the newly possible soft, durable, affordable groundwood paper.

Enter TOILET PAPER.

Making Toilet Paper

The first iteration of toilet tissue that appeared on the American market was New Yorker Joseph Gayetty’s “Therapeutic Paper” in 1857 (shortly after groundwood began to be used in paper-making and a decade before the sulfite process was introduced). Purposed as a medical product, Gayetty’s paper was sold as containers of 500 pre-moistened sheets medicated with aloe to help soothe cure sores and hemorrhoids. Gayetty was so proud of his accomplishment that his name was printed on every therapeutic sheet (“Toilet Paper...”) (Figure 3). This was the first tissue not intended for the face or for multiple purposes; it was meant solely for the tush.

The next big adaptation to TP was to turn it from individual sheets of paper into a continuous length of tissue in the form of a roll. This could not have been accomplished without the proper machinery, of course, which had been in the works for some time already.

Flashback to 1798: Frenchman Nicolas-Louis Robert invented a machine that could produce paper on an endless belt of woven wire thus creating long, continuous rolls that were less expensive to produce than individually cut sheets and had more flexibility regarding size. His patented process matted the fibers of old rags and laid them all on a moving wire belt that passed through metal cylinders to squeeze water out (“Nicolas...”). The paper maker did not work perfectly, and Robert could not smooth out the kinks himself, so he sold his patent to the owner of a local paper mill (“Bryan...”).

Brothers Henry and Sealy Foudrinier, managers of a wholesale stationer firm in London, saw a model of Robert’s invention in 1801 immediately recognizing “...this embryonic machine had the potential to transform the paper-making industry” (“Bryan...”). The ability to produce continuous rolls of paper could eclipse the slow labor-intensive process of making paper sheet by sheet in individual molds. The Foudriniers lacked any technological knowledge themselves, yet they took out an English patent that same year confident in their entrepreneurial skills and trusting that they would find the right engineer.

The brothers first approached John Hall, a millright and engineer in Dartford, England, but it turned out that his apprentice, Bryan Donkin, showed the most

promise. They financed a workshop for Donkin where he worked from 1802 until 1806 perfecting a continuous paper-making machine that would become a technical and commercial success (“Bryan...”). Donkin improved Robert’s design by passing the paper through steam-heated cylinders after being pressed to dry the fibers more thoroughly and quickly. As the principal investors Henry and Sealy named the final machine “the Foudrinier” (Figure 6), and Donkin’s paper-maker remains at the center of the paper industry today (“Toilet Paper...”).

The invention of rolled and perforated toilet paper is attributed to several companies in the later 19th century: the Albany Perforated Wrapping Paper Company in 1871, the British Perforated Paper Company in 1880, and the Scott Company in 1890 (“History of Toilet...”, “Toilet Paper...”). This dispute over the title of “original inventor” is just one pulse of a reverberating trend throughout technology’s history. There are usually multiple tinkerers, unaware of one another, working to solve the same problem simultaneously, but only one can be the first to patent the idea.

It is important to note that none of the companies listed above included the word “toilet” in their names. Albany calls its product “wrapping paper”, the British manufacturer leaves the purpose of its perforated paper unspecified, and Scott reveals no connection to any type of paper whatsoever. Allowing the T word to be publicly shared in speech or print was still in bad taste according to American cultural norms.

Following the establishment of perforated rolled toilet tissue variations were made to the modifiable aspects of toilet paper (softness, ply, color, strength). These alterations, however, are superficial and do not change the fundamental form of TP. Toilet paper as a technology was stably closed in the late 19th century as soft, perforated groundwood tissue on a roll (more on closing technologies in a later section).

After stabilizing TP some of the more notable developments over time for toilet tissue are: Northern Toilet Paper was the first company to advertise its product as “splinter free” in 1930 (Figure 4); two-ply toilet paper was developed in 1942 at St. Andrew’s Paper Mill in England; Charmin patented an air-drying process in 1973 that made softer toilet paper than the Foudrinier machine (presses pulp); Charmin introduced a “Structured” paper-making process in 1999 that produced toilet tissue stronger and more absorbent than that of other brands ; 2001 saw both Kimberly-Clark and Charmin manufacture pre-moistened perforated wipes on a roll; in 2008 Marcal Paper Products announced “Small Steps” (Figure 8b) – a new line of eco-friendly paper products, including toilet paper, made 100% from recycled material (“Toilet Paper...”). Toilet paper makes up a whole economic sector of its own now.

The Takeaway

There occurred a concurrent implementation and growth of waste plumbing, toilets and toilet paper starting in 1850s America fueled by the metropolitan life

style. American urbanites propagated the improved engineering and installation of city sewage systems for the sanitation it provided.

“In a rural society, an indoor toilet may be a convenience, but it isn’t essential. In a crowded urban environment, however, the sanitary elimination of human waste becomes a real problem, and in the absence of sufficient soil to contain and break down human waste, water became the only other medium available to carry it away. The development of municipal sewage systems in London and Paris in the 18th and 19th centuries was a direct response to the threat of disease that came from increasing population densities and inadequate waste disposal. The modern world needed the modern toilet not so much for convenience but for its own survival” (“A Brief...”).

The city-dwellers also popularized the use of toilet paper as a luxury pharmaceutical item which country bumpkins could not afford as easily. Beyond its ability to soothe sore bottoms, toilet paper was initially touted for its hygienic value. Anyone in the late 19th century knew “Toilet Paper [was] of great Medical and Sanitary value, and pronounced by the Medical profession: -- “The greatest boon the art of paper making has developed” (Figure 7).

TP and flush toilets are not inextricably paired. Toilet paper does not require gravity-led sewage piped to be used; you can very well wipe with tissue in an

outhouse, over a chamber pot, or behind a tree while camping. The paper itself is a tool that can be used in myriad environments because it can be disposed of in multiple ways besides flushing.

Similarly sewage systems do not necessitate that toilet paper be flushed into them. We could flush only our waste and throw the used toilet paper away.

America could be a toilet paperless society in which we all use bidets or wash with our hands and water as they do in India even with the extensive sewer systems, but we cho(o)se toilet paper.

What linked the use of toilet paper to the use of the flush toilet in America? It must be something more than the influence of the urban elite, right? First, TP's original promotion as a hygienic material mirrored the city-sewer's purpose of bolstering sanitation in public spaces as well as within the home. Even when toilet paper was no longer medicated or advertised as a pharmaceutical product it still retained its aura of purity – an aura which demands certain conditions to maintain that cleanliness. Would you buy toilet paper without a shrink-wrap/paper covering? Or use a wad I offered you from my back pocket? Or wipe with a reusable sponge? (Unsullied) Toilet paper is the “clean” choice.

Second, early Americans had a (British) history of using disposable wiping tool (eg: corn cobs, newspaper pages) and throwing them out of the house quickly and permanently along with their waste. By virtue of its flushability toilet paper fed into the system of making waste and any associated materials disappear as instantly as possible. One flush and it's all gone.

But why? Why does purity and instantaneous disposal matter? What does toilet paper, as a disposable single-use tool, do for the American psyche that makes it the most preferred wiping option? What does it communicate to us as users on a subliminal level?

PRIVACY

Toilet paper allows the individual to maintain a sense of a pure and private self. Gay Hawkins, a professor of cultural theory, writes that practices of personal waste management are caught up in larger political assemblages and become implicated in the constitution of the self (Hawkins 49, 151). Homes and businesses began building permanent bathrooms with flush toilets to tap into the growing network of sewer systems, and a sense of personal privacy grew to envelop toilet activities (washing, dressing, eliminating waste) that had not been there before. Bathtubs and chamber pots were no longer portable; they were now fixed and hidden behind the walls of a dedicated private space we call the “bathroom”.

The methods of biological waste management we choose can either implicate us in or blind us to networks of obligation. “They can either energize or numb the imagination” (Hawkins 48). The way in which the individual, or a culture, disposes of its bodily eliminations determines the level of responsibility that person, or that people, have for their excrement once it has left the body – if there is any responsibility to be had at all.

The method of using toilet paper and flushing it down the pipes helps the individual build a constructed private self, fuels it and reinforces it, and distances the person from their waste. First, this method leaves no evidence of a deposit like accumulation under an outhouse. Underground sewers transform the human relationship to bodily waste, and we are allowed to imagine that people (once out of diapers) do not poop at all. (Hawkins 46). Second, toilet paper as a wiping tool leaves no trace of bodily waste. It is single use unlike a sponge or cloth; it is immediately out of sight, not left in a receptacle or kept for recycling/washing; (ideally) no residue is left behind on the person's hand, on a rock, or on some moss. If we do not look into the toilet in between sitting down and flushing we are allowed to imagine that, unless we do some light reading, nothing at all happened in the bathroom and we just wash our hands because there might be a cold running around somewhere.

People, like animals, exhibit a natural avoidance of their waste (Hawkins 59). To illustrate I will recount an exchange between a person I spend a lot of time with and myself. I was telling my friend a funny story (WARNING: graphic content follows):

Me: (*excitedly*) ...so then I stood up and was about to flush the toilet, and I saw that my poop was RED and I was positive I was dying for 30 seconds (that's a long time to think you're dying) until I remembered that we had eaten this delicious fresh beet thing

yesterday at dinner. I have never felt so scared, relieved and silly all at once!

She: (*slowly*) Wow...

M: (*probing*) What?

S: (*hesitant, unsure*) Well, I don't know. I guess... Well... How did you know it was red in the first place?

M: (*thinking "Duh."*) Ummmm....I looked in the toilet before I flushed.

S: (*hesitant*) Do you do that all the time? (*Pause while I stare waiting for clarification*) Um, you know...LOOK in the toilet before you flush?

M: Yeah – every time. Don't you?

S: (*with the most severe gravity. Ever.*) No. Never.

M: Oh.

I had never felt so far away from someone I was sharing a room with. Looking at what comes out of me is an integral component of the system of checks I have to monitor my health and base-level functionality, and this special someone I thought I knew inside and out had never willingly seen her bodily waste during more than 50 years of making it?!?! How could someone (and now possibly everyone) live their lives with “invisible” poop?

“Techniques of invisibility” enable the making of a pure, private self. Sanitation standards, flushing toilets, habits, architecture, measures of disgust, infrastructure...all these micropractices combine in American society so that we do not have to see our waste at all (Hawkins 65), and toilet paper can be added to the already extensive list of invisibility techniques. Humans have always wiped with something (Appendix), but that something was not always disposed of alongside the waste itself the way toilet paper is today. We can just drop it in the bowl and flush it away without ever seeing it after tearing it off the roll.

Recall that one third of Franco Zani’s maintenance labor and costs go into cleaning toilet paper out of the underground pumps and pipes and from treatment center sewage pathways. The majority of Americans are able to flush because of our commitment to paying sanitation engineers to ensure that our micropractice of waste disposal is as invisible as possible. It is more important to us to maintain an expensive, labor intensive sewage treatment system than

either throwing toilet paper into a trash can where it is more visible or using an alternative wiping tool. It is more important for us to maintain our “pure” selves.

At this point someone like Franco Zani could argue that flushing used toilet paper is important to maintaining a healthy environment for the public at large. There is a large degree of truth in that claim seeing as it is much easier to control potentially hazardous materials within an enclosed infrastructure system. Concurrently there is a large degree of variability. Population density (NYC vs. Mongolian steppe), climate (cold and arid vs hot and humid), and potentially public health regimens (do regularly inoculated people have less pathogenic poop than those who have never had a medicinal shot?) have an effect on the incubation and spread of disease via feces. For the purposes of this paper I will continue to focus on the role flushing plays in the American psyche rather than in the sphere of public health.

Toilet paper separates us visually and tactilely from our waste and thus plays a foundational role in the construction and reinforcement of the pure, private American self while making itself, as a tool, all the more necessary in the process. As far as toilet activity goes, the bathroom as a designated space makes a distinction between public and private activities and material (Hawkins 59). The bathroom gives us an exaggerated sense of personal purity: nobody actually sees what we do in there, so each one of us (upon returning from the

“rest”room) is enabled to believe that everyone else believes we were just washing our hands or checking out our outfit in the mirror.

Having the privacy of a bathroom, however, does not save us from personal discomfort with our own bodily eliminations. Disgust is predicated on proximity, sight, and closeness of smell and touch (Hawkins 57) and humans have the desire to eliminate olfactory and visual contact with bodily waste in order to establish purity and cleanliness as normative imperatives (54). Flushing toilets and well-flowing sewer systems in America provide us a great deal of distance from our urine and feces, but toilet paper increases that gap as it allows the individual to use the toilet without seeing or touching what was deposited. TP gives us privacy from ourselves.

RHETORIC

The language and icons surrounding toilet paper make apparent TP’s role in distancing humans from our waste, the foremost example being its name: “toilet paper”. If “toilet” literally/originally means/meant acts of personal hygiene, then the name “toilet paper” leaves up to the imagination the activity for which it will be used: nose blowing, removing make-up, cleaning glasses lenses, clotting a nick from shaving, etc. Being a multi-purpose tool by name absorbs the primary use of toilet paper into a broader category of alternative applications so personal actions are less explicit. The cashier scanning your 48 roll pack of

two-ply quilted TP is allowed to imagine you using every sheet to squish bugs and clean hair out of the shower instead of wiping your rear.

Since the inception of toilet paper companies have utilized much discretion when branding and advertising their merchandise. The term “toilet paper” was so taboo when Scott Paper introduced TP on a roll on 1890 that the company was too “...embarrassed to be associated with such an ‘unmentionable’ thing. [Scott Paper refused to print its name on the product , sold the privilege to intermediary companies, and as a result New York City’s Waldorf Hotel became a leader in the toilet paper industry]” (Wolf) (Figure 7). It is not longer so shaming or indelicate to be involved in the toilet paper industry, yet Americans still dance around toilet activity and imagery maintaining a distance from reality.

Product name

Browsing toilet paper brand names at the grocery store is a wonderful way to investigate how we as Americans feel about TP. Commercial companies do not name products on a whim. People make careers out of researching markets and developing names, along with intelligent graphic design and ad placement, they believe will induce targeted customers to purchase the specific item. This can be a long, agonizing process in which every aspect of a title is scrutinized from pronunciation to root word connotations (Colapinto).

What do the big companies emblazon upon the packaging to get us to buy their iteration of TP? What do we respond to? Feel comfortable reading and bringing into our home? Most focus on lightness, purity, softness (eg: Quilted Northern, Angel Soft, Cottonelle, White Cloud), and many are simply names that consumers have become familiar with and trust (eg: Marcal, Scott, Kirkland, generic grocery chain brands). None of these names push the consumer to think about defecation, urination, or the clean up afterward; they are either non-descript company names or they conjure images of a cartoon heaven full of freshly washed blankets and sunshine.

Ad subjects

Beyond product names, companies must also choose advertisement subjects, the mascots with whom/which the public will chiefly associate the product in question. The visuals chosen to represent toilet paper, however, have little correlation with the product itself. Rather than appeal to the buyer in a utilitarian fashion, TP ads make use of cute, scientific, and moral imagery so the consumer feels more comfortable selecting an item that is used for such gross purposes.

The Quilted Northern fairies, the cartoon Charmin bears, the Cottonelle puppy, the Angel Soft cherub...all are endearing characters that attract our attention and our dollars (Figure 8a). Young beings are still clean: the puppies have yet

to develop dog breath and baby feet are far more kissable than those that have been walking around for a while. Human waste is also more acceptable in the context of babies; more people are willing to change a baby diaper than a geriatric diaper. All these youthful, fresh icons help us to consider buying toilet paper with a sense of purity and cleanliness rather than shame.

Toilet paper advertisements also emphasize the scientific tests of the strength and absorbency of the brand in question in an appeal to the consumer's rational mind (Figure 8c). I refer specifically to the side-by-side frames showing a disembodied hand pouring an equal amount of bright blue liquid onto samples of two different toilet papers lying on countertops. Each sample is lifted revealing the amount of liquid left behind, and sometimes quarters are placed on the wet suspended paper to show the differing integrity between the two brands.

An analytical approach separates the self from personal experience and allows the pure, private individual to choose between brands using objective criteria. Furthermore, the blue liquid shown in the absorbency comparisons allow the advertisements to be comfortably viewed by the public. Brown or yellow liquid would hit too close to home, red liquid could be frightening, orange or green would mean that someone was sick, but the color blue is never coming out of a human body. Thus we can watch these ads and know that ultra-super-plus toilet paper X is the most absorbent of unspecific liquids and choose to buy that paper

at the store with the science-born confidence that it will serve all of our unspecific-liquid wiping needs.

Ads for toilet tissue can alternatively focus on morals, values and ideals. TP made from recycled paper fiber instead of virgin wood appeals to the buyer's sense of social responsibility and makes the choice to purchase toilet paper a political and ecological decision (Figure 8b). This advertising strategy removes people from thinking about responsible waste management in a couple ways. First, environmentally focused ads turn toilet paper into a vehicle for social change such that the consumer almost forgets what the paper is for (ie: "I'm buying this because it saves the planet"). Secondly, by endowing recycled toilet paper with moral quality, these ads justify the continued use of TP reducing the impetus to search for paperless alternatives and forestalling any uncomfortable reflective criticism on our wiping material.

Qualities emphasized

Advertisement rhetoric emphasizes certain qualities of the product on display over others; the ad men want the consumer to pay greater attention to a particular set of features and use those to make their purchase. The toilet paper advertisements I have seen focus largely on two areas of TP attributes.

The first encompasses things like softness, comfort, and gentleness and conjures up ideas of luxury, class, deservedness, and pampering (Figure 8d). I could choose my favorite toilet paper brand solely based on which company's language makes me feel the most special. "You mean there are 400 sheets of super plush paper with aloe and lotion and spring breeze? For me?" When wiping my rear becomes a miniature spa treatment there are no thoughts in my head of which TP will actually do a better job at cleaning.

The second area of qualities has more to do with durability, absorbency, and strength and reassures the user that their hands won't touch anything undesirable. This language flirts with suggesting the harsh reality of wiping our nether regions, however it is comfortable to read and consider since it really only applies to the aforementioned unspecified blue liquid (right?). Furthermore many American ads focus on strength and ability (eg: pick-up trucks, paper towels, carpeting, cookware), so talking about toilet paper in these terms is settling into familiar habit more than actually thinking about why we would want durable toilet paper.

Case study: Charmin

Charmin toilet paper (Figure 9) began manufacture in 1928 by the Hoberg Paper Company of Green Bay, Wisconsin. The original logo was a woman's face in silhouette profile like a cameo pin, and it was meant to reflect the feminine

fashions of the day (a la cameo pins). “The design was described as ‘charming’ by an employee, and the Charmin brand was born...” (Charmin). From the get go, Charmin’s rhetoric was not about cleaning but focused on appealing to the woman’s sense of high society fashionableness. It was “charming” in title – a word rarely applied to subjects involving the water closet.

In 1953 “[a] new baby graphic was added to the packaging to symbolize the softness and quality of Charmin”. The Charmin Baby shared space with the Charmin Lady until 1956. In that year, the lady was replaced by “Charmin Babies Your Skin” slogan graphics on product packaging (Charmin). Pampering of this sort was no longer for society ladies and their fortunate families; Charmin toilet paper was now for anyone and everyone who wanted their skin to be babied.

Charmin’s appeal has revolved largely around softness. “Thousands of tiny air cushions make Charmin more gentle”. Mr. Whipple was created as a character in 1964 to further promote the “squeezable softness” of Charmin paper. At one point his “Please don’t squeeze the Charmin!” catchphrase was the most recognizable advertising slogan in America, and Mr. Whipple was named third-best-known-American in 1978 following former President Richard Nixon and televangelist Billy Graham (Charmin).

The company patented a new manufacturing technique in 1973 to produce softer paper that maintained its strength; 1993 saw Charmin Ultra and Charmin Plus with Lotion and Aloe; “New Charmin” was launched in June 1999 as “the most absorbent bath tissue in the U.S. while maintaining its renowned softness”; in 2001 regular Charmin became even softer (Charmin). This dedicated advertising exemplifies the purposeful focus on rhetoric that enables the consumer to think about things other than human waste and feel comfortable buying toilet paper.

More recently Charmin’s manufacturing has been appealing to the buyer’s sense of economy. The Double Roll containing twice as many sheets as a regular roll entered stores in 1994, the Triple Roll in 1997, and the MegaRoll (four times a regular roll) in 2005. That last product comes with the Charmin Extender, an accessory that enables user to fit the MegaRoll onto most existing toilet paper holders. Similar to recycled toilet paper, economy rolls advertise the values of efficiency, ease, and finding a bargain more than the function of the TP itself.

The latest era of Charmin ads began in 2000 with the “Call of Nature” campaign “...featuring a bear in the woods experiencing the comfortable feeling of Charmin” (Figure 10), and his cubs were introduced in 2001 (Charmin). These humanoid cartoons may represent some growing comfort with using the toilet since the bears relieve themselves behind trees and use their toilet paper

immediately afterward, yet they are still youthful, hypothetical, non-human characters that do not directly implicate us in the ad or the use of the product.

A point of note is that Charmin as a company is reinforcing the constructed private American self with regards to bathroom activity. In 2006 “Charmin unveiled the first-ever fully staffed, deluxe public restrooms in New York City’s Times Square for the holiday season” since shoppers deserve “family-friendly facilities” no matter how crowded a place is (Figure 11). Here is a description of the facilities from their inaugural year:

“In time for the holiday season, the Ultimate Charmin Family Experience is here! And by “family experience,” Charmin means going to the bathroom together in delightfully clean (at this point) bathrooms in Times Square! There are 20 clean and comfortable restrooms, open from 8AM to 11PM through December 31 (well, the potties are closed on Christmas and will close at 6PM on December 24 and 31), but there's also a waiting room with flat-screen TVs and a fireplace.

Workers will be cleaning the bathrooms after each use (and it's probably considerate of you to flush), so these might be the cleanest bathrooms in the city. And don't forget to take your picture with a Charmin bear!” (Chung).

Then in 2008 Charmin partnered with the “...SitOrSquat mobile app to help people find clean public restrooms when they’re on the go” (Charmin). This is

taking the pure, private self way past “Just hold it to the next gas station” to “There’s a five-star hotel with a bathroom in the lobby about 2 miles from the next exit. We’ll go there.” Pulling over into the highway shoulder, hopping the guard rail, and walking to the nearest bush? It’s illegal in most American states.

Social Construction Of Technology

So, we have toilet paper, use it, rely upon it, can’t do without it. Fine. But why do we have so many kinds of toilet paper? The name brands, the generic versions, the multiple options each of those offer to us – why are they available? How can toilet paper companies make so many kinds of toilet paper and make a profit? Because we want them.

In 1984 Trevor Pinch and Wiebe Bijker introduced their Social Construction of Technology (SCOT) theory to challenge widely accepted technological determinism. Technological determinism purports that technology develops according to a linear model where a superior technology will naturally become dominant, invalidate previous technologies, and force society to adapt to its presence. For Pinch, Bijker, and other science and technology scholars, this interpretation did not account for human interests in decision making, did not explain innovation, and discouraged the public from engaging in the process of developing technologies. “SCOT focuses attention upon what counts as a viable

working artifact, and what counts as a satisfactory test of that artifact” (Kline and Pinch 766).

According to the SCOT model every artifact created is subject to **interpretative flexibility** meaning that several people can look at the same item and see different things. Pinch and Bijker identify **relevant social groups** as groups of people sharing the same meanings for a particular artifact (eg: engineers, advertisers, consumers, salesmen). Each group fights for control of an artifact’s design because each one defines the problem (supposedly solvable by the artifact) differently and therefore envisions and prefers a technological design distinctive from the others. The tug-of-war between interpretations continues until the artifact comes to a point of **stabilization**: either the relevant social groups view the problem as solved and reach closure, or the problem is redefined thereby eliminating flexibility (Kline and Pinch 765-766).

Take the classic example of the bicycle. At first the high-wheeled bicycle was open to a high degree of **interpretative flexibility**. Condensing the sides, young men saw it as the perfect social sporting machine whereas women and the elderly found it both dangerous to the public and impossible to use for their own transportation. The **relevant social groups** (most basically young men, elderly men, women, and children) could not agree on whether the bicycle was meant for universal transportation or for speed racing. Following the invention and application of the pneumatic tire the bicycle reached **stabilization** through

closure; the air filled tire allowed for smaller bike wheels without sacrificing smooth ride allowing children, women, and the elderly to ride and also enabling men to ride faster than before. Both problems were solved by one artifact, and the basic design stuck (Figure 12).

SCOT 2.0

About 10 years after the SCOT model was first introduced Trevor Pinch and Ronald Kline found it lacking. The original model "...dealt mainly with the design stage of technologies [making the notion of closure a little too rigid. In 1996 Pinch and Kline studied the adaptation of the motor car in rural America to] explore how interpretative flexibility of an artifact can reappear at the use stage of a technology" (Kline and Pinch 767). The automobile had already stabilized in fundamental design (systeme Panhard) as a machine for personal transportation by the time it spread from the city to farm country. The manufacturers, however, could not control how farmers used the automobile once they had it home (774-775).

"Users precisely as users can embed new meanings into the technology" (Kline and Pinch 775). For the American farmer the automobile was useful for so much more than transportation: "Corn shellers, water pumps, hay balers, fodder and ensilage cutters, wood saws, hay and grain hoists, cider presses, and corn grinders were all powered by the auto" (775). The engine was a stationary

power source that could power butter churns, wool shears and washing machines; the cab was useful for driving products as well as people to town and market; the vehicle could be converted into a tractor or snow plow. The application of technology, like design, is flexible because groups of people are able to see more than the manufacturer's vision when they look at an artifact.

SCOT vis a vis TP

Like the automobile, toilet paper in America has a solidified base design, a highly variable accessory design (dealing more with aesthetics), and a greater meaning beyond the face-value "cleaning tool". The systeme Panhard of toilet paper is 4.5 inch wide softened wood pulp rolled into a cylinder (Don't squeeze it!). I am confident that the majority of Americans would be able to identify a roll of toilet paper if shown one. If I told you to go into the kitchen and bring me the "big salad bowl" you would have to open the cabinets and look through all the bowls you think I would term "big" and perfect for salad (not the mixing bowl, the soup crock, or the chili pot; china? Porcelain? Glass?). Then when you got frustrated you'd come out and tell me to find it myself. But if I asked you to go into the closet and bring out some rolls of toilet paper you would know exactly what you were looking for and, even if they weren't in a highly visible place, you could search until locating them or be confident that I am out of toilet paper.

Despite toilet paper having a stable fundamental design, TP is flexibly interpreted by users as evidenced by the great variation in accessory design. Some toilet paper is colored for people like my Gramma who see the wiping tool as an opportunity to further color coordinate the bathroom. Some TP is recycled for those into environmentally responsible consumption. You can buy single-ply non-perforated paper if you're feeling thrifty/ascetic/masochistic, or you can choose two-ply perforated tissue for something cushier and easier to rip. You can also find single-ply perforated rolls if you're into compromises. You can buy single rolls if you live simply or 48-packs if you see toilet paper as something to stockpile. You can even make fashion art out of toilet paper – something Joseph Gayetty would never have forecasted.

Why is toilet paper manufactured in so many varieties?

Multiple solutions for multiple problems

On one hand, toilet paper options exist because there is a market for them. Individuals and the relevant social groups to which they belong conceive of toilet paper accomplishing various things, and they get manufacturers to make what they believe will solve their problem. “To meet consumer demands [in 1986], Charmin introduced unscented and Charmin Free products (free of inks, dyes and perfumes)” (Charmin), so they were producing paper with ink, dyes and

perfumes, paper with inks and dyes only, and paper with no added colors or scents. That's a lot of variety for one company to offer profitably.

Charmin also introduced Charmin Ultra Strong (partner to Charmin Ultra Soft) in 2007 when they had just developed Charmin Basic, a toilet paper with "...softness, strength, and value rolled into one" (Charmin). Charmin Basic sounds as though it would meet everyone's wiping needs, yet some people see their personal wiping problem as requiring more than average strength and still others need more than average softness. There is a contingent of consumers for whom Charmin Basic perfect for them, but why don't the companies just make one Ultra Strong Ultra Soft toilet paper, serve everyone's needs and be done with it? Why make so many kinds of toilet paper?

"Living within my means...or so you think"

Beyond solving the problem of how to wipe the best, toilet paper is a household commodity, and a wide variety of TP types make available products that fit into various price ranges of each household economy. We all want to wipe with toilet paper, so how comfortably can we afford to do so? The relevant social group that purchases generic toilet paper could very well believe that Charmin brand does the job better, yet its constituents may not be able to afford the product.

According to the savvy blogger of Happy Money Saver, “[T]he bottom line is this – softness comes with a price and only you can determine what you are willing to pay. I’m not ashamed to say I’m a 1 ply and proud. I just love the best value price so much, and how long each roll lasts”. Here the problem is “How can I use toilet paper and not spend more money than I can afford?”, and the answer is “Let go of extra luxurious paper fibers and do with less.”

In this way toilet paper can be a declaration of disposable income and material comfort. I say “can” because TP is not a reliable direct indicator. More often than not people buy “nicer” toilet paper than their accountant would recommend. As eloquently phrased by stand-up comedian John Pinnette:

“When people buy bad stuff at the supermarket I tell them. I saw one guy buying cheap toilet paper. I said, ‘What are you doing? That’s four rolls for eighty-nine cents. That can’t be good. Dontcha like yourself? I understand the need to find a bargain, but toilet paper? You buy GOOD toilet paper. I’ve been really broke; I always got good toilet paper. It’s a line you don’t cross. It tells you everything will be alright. The bills are late, but I got good toilet paper” (“john pinnette...”).

Even when strapped for cash Mr. Pinnette was able to prioritize his funds and have enough for rolls of 3-ply.

Similarly I have also been in households where generic single-ply paper was used day-to-day, but Quilted Northern was put on the TP holders if company was expected. In situations like these the problem is, “How do I reassure myself and confirm for others that I have a comfortable lifestyle?”, and the answer is “Buy the more expensive toilet paper.” People can tell the difference, and it’s better than buying \$500 dollar shoes every week.

The fascinating part of how people choose toilet paper is that for all TP does to reinforce our constructed pure and private selves, it is still associated with the luxury it originally communicated in the late 19th and early 20th centuries. It is no longer rich : poor :: toilet paper : Sears catalog. Now it is rich : poor :: Charmin : Marcal. Even Vassar College participates in toilet paper communication: all dorms and academic buildings are supplied with industrial rolls of “half-ply” TP (a friend came up with that lovely designation) while the Rose Parlor bathroom (frequented by visiting dignitaries, guest speakers, and college administrators) offers a more plush variety.

Which toilet paper one chooses is a function of tactile preference, affordable price and the desired message it sends to friends, strangers and the individual psyche. The communicated message is what makes any switch away from toilet paper - taxing natural resources and sewer infrastructure - more difficult.

Each household has the pressure to “Keep up with the Joneses” through the intimate choice of toilet tissue.

LET’S REVIEW

Indoor plumbing/sewage connections encourage toilet paper use as it is more flushable than magazine pages and corn cobs, but toilet paper neither requires there to be pipes for it to be used nor do pipes require people to wipe with something flushable. Flushing is an option we have chosen. Toilet paper and pipes proliferated simultaneously in urban areas since that was where cosmopolitan people could afford the luxury of TP and the benefits of public sewage systems were greatest.

Toilet paper reinforces the relatively new privacy surrounding American bathroom activity. TP helps separate us from the waste materials we produce, visually and tactilely fortifying the concept of a pure self and making itself a necessary part of the fabric of our daily lives.

The distance between Americans, our waste, and our wiping tool is shown in advertisements. We certainly have come a long way from the Victorian era when explicitly mentioning the words “toilet paper” in speech or text was too taboo for Scott tissue to use its own brand name as a logo (Wolf). We are still

skittish about the details, however, and rely on scientific, youthful and clean vocabulary and icons to put us at ease.

The SCOT theory can help us interpret why toilet paper is what it is (variable, pluralistic) and isn't what it isn't (a more singular/straightforward closed technology). Each individual who uses it wants TP to accomplish something different: resist rippage, absorb a lot, fit within the household budget, tell other people that you can afford luxury, etc. Relevant social groups apply TP in various ways in the technology's use phase, thus TP takes multiple forms to accommodate each group of people.

This project is not meant to be a manifesto against toilet paper altogether. Alternatively it is my hope that your eyes, as the reader, have been opened to a part of American culture willingly and comfortably glossed over. Toilet paper and its use in America are social and cultural constructions in which we take part, and I believe it important to be aware of the systems in which we participate so we can criticize, appreciate, modify, maintain or change them and understand what the alternatives may be. Without the knowledge of alternatives we may very well find ourselves stuck on the toilet immobilized by an empty roll of toilet paper.

Figures

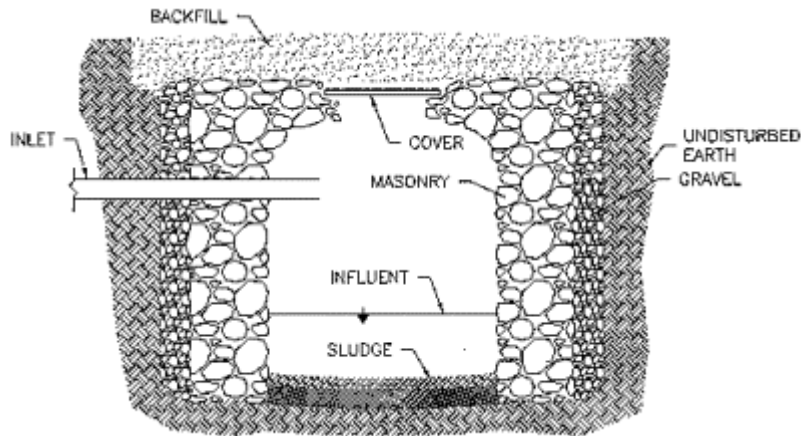


Figure 1. Diagram of a cesspool as it would have been constructed in the late 18th and early 19th centuries, although some were not always covered with backfill. The sides are not sealed to prevent leakage.

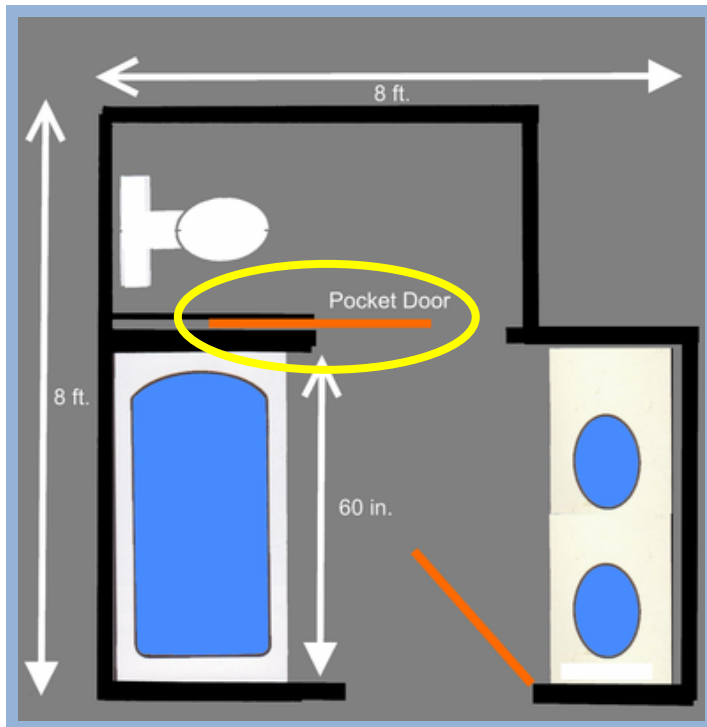


Figure 2. The pocket door slides out of the ell wall within the bathroom to provide an extra measure of privacy.



Figure 3. Joseph Gayetty's medicated paper – each packet proudly displaying his name.



Figure 4. Quilted Northern bath tissue is “soft and 100% splinter free”. You can wipe with confident security.

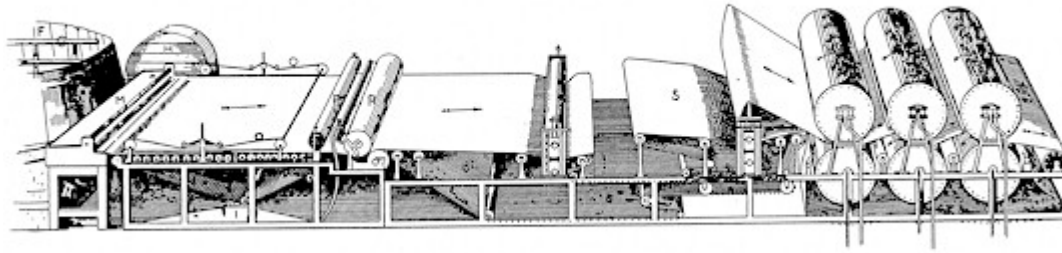


Figure 5. The Foudrinier machine circa 1850.



Figure 6. Majestic Pure Medicated Toilet Paper produced in the late 1800s. The packaging posits the cultural and hygienic implications of using toilet paper.

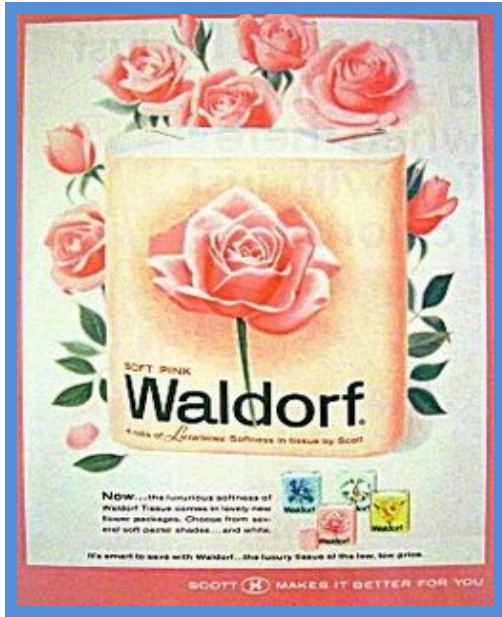


Figure 7. Waldorf Brand toilet paper taking the hit for the bashful Scott Company.



Figure 8. Various marketing strategies, each one distracting from what toilet paper is used for. Clockwise from top-right: a. baby, youthful, pure, angel, heaven, b. eco-friendly, moral choice, save the planet while you squat, c. scientific objectivity, blue liquid, d. luxury, pampering, deservedness.



Figure 9. Timeline of Charmin packaging marking the transition from the Lady to the Baby.



Figure 10. The introductory advertisement with the new Charmin Bear (2000).



Figure 11. Charmin's holiday bathrooms in New York City's Times Square.



Figure 12. A very very very simplified diagram of the social construction of the bicycle.

APPENDIX

Prior to toilet paper, these civilizations/classes commonly opted for the following:

- Wealth Romans -Wool, rosewater
- Public Restrooms in Ancient Rome- A sponge soaked in salt water, on the end of a stick
- Wealthy French – lace, wool and hemp; bidet
- Middle Ages – hayballs, a scraper/gomph stick kept in a container in the privy
- Early Americans – rags, newsprint, paper from catalogs, corncobs, and leaves
- Viking Age/England- discarded sheep and lambs wool
- Hawaiians – coconut shells
- Eskimos – snow and Tundra moss
- India – your left hand and water
- Commoners – Defecating in the river is very common
- Sailors from Spain/Portugal – frayed end of an old anchor line
- Medieval Europe- Straw, hay, grass, gomph stick
- United States – Corn cobs, Sears Roebuck [catalog](#), mussel shell, newspaper, l eaves, sand
- British Lords – pages from a book
- Elite citizens – Hemp & wool (ENCYCLOPEDIA)

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Images

Figure 1. www.cefns.nau.edu/Projects/WDP/resources/treatmentsyst/Cesspool.htm

Figure 2. homerenovations.about.com

Figure 3. www.neatorama.com/2011/05/19/toilet-paper-how-america-convinced-the-world-to-wipe

Figure 4. www.neatorama.com/2011/05/19/toilet-paper-how-america-convinced-the-world-to-wipe

Figure 5. http://www.dartfordarchive.org.uk/technology/paper_donkin.shtml

Figure 6. <http://nobodys-perfect.com/vtpm/exhibithall/Vintage/Majestic.html>

Figure 7. www.neatorama.com/2011/05/19/toilet-paper-how-america-convinced-the-world-to-wipe

Figure 8. a, b, c. walmart.com
d. tailotherat.blogspot.com/2010_11_01_archive.html

Figure 9. www.charmin.com

Figure 10. www.charmin.com

Figure 11. http://gothamist.com/2006/11/20/charmins_times.php

Figure 12. <http://www.britannica.com/EBchecked/media/4516/James-Starleys-penny-farthing-bicycle-1883>

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