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A Note from the Editor

To twist a common idiom, "good luck comes in threes " and indeed, this third edition of Lucerna, the undergraduate honors academic journal for the University of Missouri – Kansas City, has thoroughly fit the bill. This year, as with most progressive years of a work, the process was streamlined, the editors wizened and willing, and the sheer fun of the challenge increased ten fold. For this, some much-needed thanks are due: first to the UMKC College of Arts & Sciences Student Council, and the A&S Dean Karen Vorst who have repeatedly shown conviction and understanding of the importance of an enriched undergraduate education. Next, thanks are obliged to the UMKC Student Government Association for their aid in funding Lucerna. Thanks must also go to the staff advisors in the UMKC Honors Program, who form the backbone and moral support for the journal. But mostly, the greatest thanks go to all the students who have submitted their works, and all those who honor them by reading these words now.

Like the previous installments of Lucerna, this edition has strived to print only the best of serious undergraduate academic works, ranging from all departments and backgrounds. Through a rigorous, peer-driven selection process, the papers inside express originality, solid argumentation and creativity. Further, what makes Lucerna have that flash of life is the sheer variety of works that adorn its pages. Biology, Chemistry, English, Fine Art, History, Philosophy, Political Science all can be found within this modest paperback you now hold. Each paper sparked from minds determined to learn more about the world, each striving to question, seek and kindle the embers of curiosity. There is something inside for everyone, and each paper can ignite new thoughts and ideas in anybody.

Enjoy!

Jacob Westen,
2008 Lucerna Editor-In-Chief

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Allyson Walker

(Department of English)

The Seussian Universe

You hear the proclamation, "Yes, and young George was reading Homer's The Iliad by age 7!" It is a boastful exclamation, shared with pride, claimed to stranger and friend, far and wide. Everyone must know that George, the young intellectual son of bourgeois parents, is reading Homer – the classic, beautiful, and widely respected Homer. But how often do you hear the parent bursting with pride claim, "Yes, and young Johnny was reading Dr. Seuss by age 7!"? Never. This paper will explore not only why a parent might not proudly proclaim their child's accomplishment of reading Dr. Seuss, but will also define the child, and their parents, who would read the literary anomaly that is Dr. Seuss. Dr. Seuss and his unique children's literature fit precisely into the idea of the carnivalesque as presented by Peter Stallybrass and Allon White in "Bourgeois Hysteria and The Carnivalesque." Further, Dr. Seuss defines what is the carnivalesque, and his work can be used to represent and interpret the entire theory of bourgeois hysteria and the new, subversive carnival element as the grotesque.

To understand the relationship between Dr. Seuss, the carnivalesque, and bourgeois hysteria, we must first fully understand the theory which links them. This theory is presented in full in the book, The Politics and Poetics of Transgression, in the chapter discussing "Bourgeois Hysteria and The Carnivalesque." Essentially the theory traces the development, through industrialization and urbanization, of a bourgeois class who, in order to assert their power and avoid what they term the "grotesque," stifle and attempt to crush the carnival elements of festivity which mark the life of the lower class and their celebratory, primal, and pagan lifestyle. This rise of the bourgeois and quelling of the carnival occurred in the 19th and 20th centuries alongside the development of industry, and thus classes. Specifically, the carnival was the grotesque: that which the bourgeois wanted to avoid. Carnival constituted the vulgar, festive nature of man, only that which the Other would participate in. "A fundamental ritual order of Western culture came under attack – its feasting, violence, drinking, processions, fairs, wakes, rowdy, spectacle and outrageous clamour," essentially, that which was carnival was under attack (Stallybrass 102). It wasn't necessarily that this Other was too disgusting for bourgeois

class participation, it was more an attempt to define a characteristic of separation to look down upon and allow a class of people to separate themselves and "rise above."

With this festivity came the fear of rebellion, a gathering of all jovial energies into one rebellion, and the bourgeois determined that a method of harnessing this must be developed (Newman). Thus emerged the bourgeois concept of avoiding the carnival, the Other. "From the seventeenth to the twentieth century…there were literally thousands of acts of legislation introduced which attempted to eliminate carnival and popular festivity from European life," for precisely the fear that these celebratory gatherings would lead to
revolution (Stallybrass 102). In fact, early carnival theorists argue that bourgeois fear of the carnivalesque stemmed from the manner in which the carnival displaced and utterly inverted the normal social hierarchies which kept them in power (Stallybrass 99).

Domination and damnation of the carnivalesque into the grotesque occurred in four forms: fragmentation, marginalization, sublimation, and repression, all to prevent such feared rebellion. These modes of suppression are in continued use today in stifling
the "carnival" of our modern world, whether that carnival element be of the literary textor otherwise. In fact, the modern literary text, or popular fiction, is criticized under the popular culture theory of Leavisism for precisely that reason: containing the carnival element unsuitable of the bourgeois. "Popular fiction…is condemned for offering addictive forms of 'compensation' and 'distraction': This form of compensation …is the very reverse of recreation, in that it tends, not to strengthen and refresh the addict for living, but to increase his unfitness by habituating him to weak evasions, to the refusal to face reality at all," (Storey 18). The carnival element, in this case in the form of popular fiction, is the grotesque festivity which must foremost be avoided and further, repressed in order to allow the bourgeois class to maintain their ignorance of distinguishing
characteristics which divided "us" and "them," and assert control over the Others who engage in this vulgarity. If they gained knowledge of the gross habits of these people below them, they were no longer any different or better – merely an addition to the crowd of festive lower class peoples. The carnivalesque has been summed up in the idea that it is that which is a break from productive activity; it is common gaiety, not constructive (Manga). This is precisely what some would say of Dr. Seuss…a mere break from productive learning and reading.

In 2004, when asked about Dr. Seuss, a children's librarian said, "Dr. Seuss? Oh, we hide Dr. Seuss – well, not really. We keep him over there on a special shelf. We'd really rather they read something

better – something more like A.A. Milne." (Mason). The life of Theodore Seuss Geisel, the real Dr. Seuss, and his ensuing writing style, is precisely what leads to this kind of bourgeois opinion of Dr. Seuss as grotesque and to suppress him from children. Geisel began writing his children's books in what the popular culture Leavisites termed the 'cultural crisis' of the 1930's. Throughout the twentieth century America experienced a cultural decline, claims the Leavisism theory, and this came with the advent of such pop culture literature as Geisel's Dr. Seuss books (Storey 17). This supposed cultural decline came in the form of less intellectual and moral entertainment. The radio, television, and paperback "chain" novel were all just that – entertainment, not a moral or intellectual stimulus contributing to the forward movement of the world. They were the break from productivity which marked the carnivalesque. The carnivalesque was forced into demonization in this time, however, because with this 1930's cultural crisis, also came the emergence of the bourgeois class system and their assertion of power lead to terming Seuss books as the grotesque, the cause of this cultural decline (Stallybrass 102). It was a full circle push, where certain items or characteristics must be marked as lesser or grotesque to allow another class to define reasons why they were better. As a result they "demonized" those culturally entertaining, delightful things that this Other class enjoyed due to basic human nature, and blamed them for a cultural decline which the bourgeois would specifically avoid. Dr. Seuss's books would be just one victim of such a system.

Theodore Geisel developed in this repressive system, and evolved in it closely linked to the surrealist movement of the time. His pictures, and their subversive messages, were indebted to this revolutionary movement of unexpected juxtapositioning to arrive at new, unique ideas (Mason). A book published posthumously, The Secret Art of Dr. Seuss, is a series of paintings by Geisel which are highly surrealist. Geisel was influenced by the surrealist time he wrote in and used it as one form of inserting shreds of the carnival into his books as such a practice grew more and more oppressed. Tied to this, Geisel, aside from being a surrealist, was a man of great ambiguity – another tactic in weaving the festive carnival into his books. Freud used comic, cathartic laughter to salvage shreds of the carnival from the bourgeois subconscious of some of his hysteria
patients (Stallybrass 100). They saw the feared carnival as now comic. Geisel did this to an extent with the ambiguous atmosphere of his life. Living in the time of bourgeois hysteria, Geisel obviously could not outright argue for a return to the carnivalesque. However, looking at his ambiguous stories, such as The Cat in the Hat (1957), they lead you down a cloudy path that in this case ends with a question, "What would YOU

do / If your mother asked YOU?" (Mason). Geisel walked through your subconscious and through ambiguous references and final question, forces the reader not only to consider their primal response, but to return to a focus on the individual. Neither of these are what a typical good bourgeois parent would want their child considering, and further are exactly the Other which they wish to avoid. But it is the time that Geisel wrote in, that of surrealism and ambiguity from an oppressive bourgeois emergence, that lead him to create such 'grotesque' works.

Many of these cohorts whom Geisel evolved with and received influenced from, were highly Marxist – not surprising then that they would work so hard to revolt against the bourgeois stifling. Geisel, however, was instead a left wing liberal democrat (Mason). He needed to remain comfortably friendly in order to still be invited into some American children's homes. That is precisely the problem however. Dr. Seuss would only be invited into the homes of children with working class parents. An upper, bourgeois class of parents would have not only been disturbed at the foul pictures and language, but frightened by the ambiguous and surreal manner of the books and would not have allowed such thought into their homes. Such parents would encourage and even demand that their children hold the same social class and power as they maintain. If Dr. Seuss's books begin encouraging a child to question authority or think independently from their parents, this certainly would have been a problem most unwelcome. Further, if a Seuss book demonstrates and leads a child back to the grotesque, festive habits that parents have worked to avoid and rise above, particularly at such a formative age, parents would come terrified their child would drop in social stature.

Stallybrass and White tell us, "There are indeed deep connections between childhood rituals, games and carnivalesque practice," and Geisel took full advantage of such a connection to encourage children to see beyond their mental limits and embrace this festive atmosphere, whereas the bourgeois parents would have stopped the carnival long before the Dr. Seuss books – likely somewhere around the nursery rhymes and games familiar to childhood (Stallybrass 102). Geisel, for this reason, was in fact rejected by 28 publishers who feared that his form of books were not only improper to children, but would be rejected by their parents both because of the disgusting and independent habits they modeled and for their lack of intellectual propriety (Brunner). Seuss books didn't use "real" words and certainly didn't encourage vocabulary or early reading if they didn't stick to the essential rules of English language. If a book was not providing an advancement in obvious, strict education, then it was not advancing a child socially. We must understand that

in the popular culture developing at the time, education is the road to high, upper-class culture, and a culture of independence, festive creativity, and inspiration was not one comfortable nor supportive to the bourgeois class and thus Dr. Seuss was not a welcome development in literary education (Storey 15). This is further evidenced by the fact that Geisel, considered a preeminent children's author, never once won the Caldecott Medal, but was instead awarded a special Pulitzer Prize for contributing to the enjoyment of America's children and parents, certainly not contributing to their production or education ("Theodore Seuss Geisel"). Geisel's carnivalesque stories encouraged children to "reach out…toward a repertoire of carnival material as both expression and support." (Stallybrass 101). The bourgeois simply could not have this.

Stallybrass said that, "The carnivalesque might erupt from the literary text, as in so much surrealist art," (105). How true this is of the texts of Dr. Seuss. The shreds of the carnival appear everywhere in the Seussian universe of Theodore Geisel's books. Primarily, due to his influence of surrealism and ambiguity, the carnival can be observed in the language, the pictures, and the basic story of each Dr. Seuss book. The twisted versions and accoutrements of the Seussian world are precisely what the bourgeois wished to avoid for they could not deal with variation, and through this distaste for diversity, they built their power. By creating a specified set of characteristics in education, language, and lifestyle, the bourgeois ensure they were different and thus better than other classes. One must not vary from these distinctive principles, or else they entered the Other of the lower class. Dr. Seuss clearly meandered away from the strictly educated, demure, focused lifestyle this upper-class prized, making him and his work grotesque.

A Dr. Seuss book can foremost be recognized by its unusual use of language. Not only the different and unique use of accepted language, but the complete creation of words as well. In fact, Geisel is attributed with the creation of the word "nerd" in his experiments with vocabulary (Brunner). Theodore Geisel essentially attacked language; he pointed out the complete arbitrariness of language by changing it. This subversive act of displaying how one man alone can shift the foundation of our communication threatened the bourgeois power. By disrespecting the traditions they demand, the rules of language, he further created fear of loss of power and mystique in those people who believed and wished themselves a social class higher than the rest (Mason). They do not wish to deal with the carnival festivity of new, exciting words; they do not wish their children to learn words which do not yet exist or to reach the conclusion that we each can use our own individual lexis. Their children would then be exiting the characteristics defining their higher

class and be entering another world, yet unchartered, which must be lower because people of bourgeois status would not stand for different rules and principles to be better than their own.

The development of 'fake' words is grotesque, and below the bourgeois class. Geisel does exactly that which C.L. Barber defines as an act of carnival: in the Seussian universe, "the energy normally occupied in maintaining inhibition is freed for celebration," (qtd. in Stallybrass 102). Dr. Seuss does not waste energy following or even learning the rules of language; instead he reverts to his festive, uninhibited human nature to express the world in his own terms. One example of this is in the book The Lorax (1971) which speaks of a place of "grickle-grass" and "truffula trees" as well as man named the "Once-ler." Further, new phrases are included such as "miff-muffered moof", "slupp", and a "snergelly hose". Not only are these new words and phrases, but Geisel writes in a metered form that comes out with a sing song nature – a further taunt of festivity that the bourgeois wish to suppress. He was known to use anapestic tetrameter, trochaic tetrameter, and a mixture of trochaic and iambic tetrameters (Ghare). This rhythmic sound of never before seen terminology simply serves to stir the jovial nature of readers, a shred of the carnival in a children's book. Phillip Nel, author of the book Dr. Seuss: American Icon, described this insolence for language best when he described the mind of Dr. Seuss as, "Why use snarl when I can use snerl?" (qtd. in Mason). Theodore Geisel would not allow the carnivalesque to be stifled, in language or otherwise.

Much the same, the carnival world is seen in the illustrations of a Dr. Seuss book. Nothing is as it should be according to the norm set by the bourgeois. Houses look different, creatures act as people, and there is not a single straight sidewalk to be found. Just one example of this in the many books of Dr. Seuss is in the book, Green Eggs and Ham (1960). The picture of actual green eggs and ham makes bourgeois parents cringe – there is no such thing, why is it drawn as such? Not only would bourgeois parents not want children to see such an imaginative item, but to them it is 'grotesque', not of their class and below them, an element of the Other. The book continues on with fantastic drawings of cars, trains, and boats stacked helter-skelter hurtling throughout the story on a track supported merely by a stick. Further, what is possibly the most disturbing element that pervades all Dr. Seuss books are the characters. They are furry type creatures with flappy ears and tall hats. They have only four furry fingers and webbed feet. To allow the imagination the kind of possibility laid out in full color in a Dr. Seuss book is repugnant. Bourgeois parents have no room for such wild imagination; opening that door of different, unusual principles opens the possible risk of sliding out of their own tightly guarded class.

The very activities and accessories of the books are uncivilized, unlike the bourgeois, and they entertain a sense of possibility through their buoyant nature. If such possibility is not harnessed through a general disdain and repression, then the possibility for a carnival revolution builds where the bourgeois would no longer be the most powerful class.

Looking at the illustrations in a technical sense, one can see the influence of surrealism in the chaotic organization of the pictures and further see the carnival element of animalism and primal human nature in the features of the characters. Philip Nel, in his book The Avant-Garde and Postmodernity: Small Incisive Shocks, associates many of the pictures of Seuss books with innovative icons of his time. For example, his machines pay tribute to the unique Rube Goldberg and his buildings reflect the amplification of the landscape, something unimportant to the bourgeois, as attributed to architect Antonio Gaudi (Mason). Seussian illustrations are slippery, full of twists and turns; that is precisely the effect Geisel worked for – a carnival touch to slip away from the bourgeois repression.

Perhaps the most effective technique of inserting the fragments of the carnival which Geisel used are the subliminal messages included in all of his stories. Many adults would be surprised to learn that each of the beloved stories of Dr. Seuss that they read as a child had a specific point which it was trying to submerge into the minds of young children. Many more adults would be angered at the messages which Geisel was spreading: environmentalism, revolts against authority, diversity, and a parody of President Reagan's arms race. The Lorax (1971) tells the story of he Once-ler who cut down all the truffula trees and ruined the land – a critique of environmental destruction. The Butter Battle (1984) is a lampoon of Reagan's arms race. The Sneetches (1961), perhaps the most obvious message, is bluntly stating the effects of a negative outlook on diversity, a child's recitation of the Holocaust. Most frightening to a bourgeois parent are Bartholomew and the Oobleck (1949) and Yertle the Turtle (1958) which are both about rulers imposing their will on their subjects and reflect Geisel's encouragement to question authority. For example, in Yertle the Turtle (1958), the ruler attempts to build his throne on the back of his subjects, and the turtle, Mack, on the bottom says, "I know, up on top you are seeing great sights,/ But down at the bottom we, too, should have rights." (Mason). This is a message which bourgeois parents would not want their children hearing: the notion of questioning authority such as parents and higher classes, or of doing anything less than being the structure of an organized hierarchy and submitting to it so they rise in the power struggle.

Not only do the subliminal messages which Geisel included

teach messages of celebration and merriment, individuality and creativity that need to be harnessed to prevent revolution, but further, these messages are things which the bourgeois simply do not want to consider, ideas which are simply too vulgar and grotesque for them to accept. The bourgeois do not want to genuinely care about environmentalism or the effects on our earth, they don't want to persistently worry about an arms race and the fate of humanity. They, further, do not want to concern themselves with diversity, dealing with others different from them. The ramifications of doing any one of these things would pull them down from their lofted, superior position and the power their social class holds. Only pagan, festive people would deal with these crude problems. Geisel works to force all people to think about these issues in the subliminal messages of his stories, he forces the carnivalesque into children's lives through his literature. Theodore Geisel, through words, pictures, and stories, allowed a child to connect to the carnivalesque nature that is natural to humans. We return to what Freud dubbed 'clownism,' what is actually the carnival, "the imitation of animals and circus scenes…they seek their satisfaction to the accompaniment of the craziest capers, somersaults and grimaces'" (Stallybrass 101). The carnival, what the bourgeois called the grotesque, is all this 'clownism' precisely in the very language and illustration that develops the sublime story in the Seussian universe.

The bourgeois hysteria that developed as the classes emerged through industrialization drove the upper class to stifle this carnival nature of the working class for the reasons we have explored: "Carnival was too disgusting for bourgeois life to endure…it contained a promiscuous loss of status and decorum which the bourgeoisie had to deny as abhorrent in order to emerge as a distinct and 'proper' class," (Stallybrass 105). In order to ensure that the carnival and its participants did not reemerge with strength and zeal, the bourgeois muffled the festival, and that which is marked with a festival nature, through fragmentation, marginalization, repression, and sublimation. The works of Theodore Geisel, which were highly skilled in implementing the shreds of the carnival, experienced this oppression as well. They both contained the grotesque which the bourgeois could not endure if they wished to maintain their status, and they also were the supposed stop in productive learning which their class detested. Thus emerged methods for crushing the carnivalesque, Dr. Seuss.

The observable method of fragmentation in the works of Theodore Geisel comes as an attempt to fragment anything that might contain an element of vulgar gaiety. Fragmentation, oppression by separation, would not allow Geisel's work to contain the entire nature of the carnival in one work, instead it must be subliminally hidden in

the story and pictures. Notice that intermixed with the creatures of Seuss you can often find a "normal" human or pet. Further, a story can only contain one aspect of the carnival. Geisel cannot both embrace diversity and criticize authority. In The Sneetches (1961) he is able to contain an aspect of diversity and cceptance, but it requires a separate book, Yertle the Turtle (1958), to discuss a critique on authority. "During suppression…there was a tendency for the basic mixture to break down, certain elements becoming separated from others…the grotesque body was fragmented." (Stallybrass 103). Dr. Seuss could not completely force a child into a return to their uninhibited human nature when he could only include certain aspects of the carnival, shreds. The carnival was torn from itself – a picture mixed in with the accepted normal, a few strange changes in language amongst an entire story. This fragmenting of the books forced a suppression of the carnival in the Seussian universe where the carnival never came out full force, but only piece by piece.

One of the most obvious methods of containment of the carnival that is noted in Dr. Seuss books is that of marginalization. The books were typically read by children of the working class and rarely recommended by the likes of a librarian or educator as detailed previously, for they are "destined to remain to wallow in 'their beer, their gin, and their fun,'" (Storey 17). Why else would anyone read a Dr. Seuss work, other than for fun? That is precisely the attitude which marginalized the work of Dr. Seuss. Only those who wallow in fun would read Seuss, would take a break from productive educational reading. "Part of the process was…the 'disowning' of carnival and its symbolic resources, a gradual reconstruction of the idea of carnival as the culture of the Other," (Stallybrass 103). Dr. Seuss became marginalized. Only a working class person who did not require education or culture, who had not evolved as far as the bourgeois or had no need for their culture of traditional, strict education, would still relent to this animalistic and grotesque literature of entertainment. Dr. Seuss, along with sitcoms, romance novels, and pop music, was of no intellectual value, but instead entertainment that only "those people" needed. The carnival, once again, was suppressed through the wide spread belief that only those of Other, those working class people who didn't require traditional cultured edification would read something such as Dr. Seuss which contains this festive nature. Tied directly to this is the system of repression which also subdued the carnivalesque. That which was marginalized was what the bourgeois should avoid: they would not participate in something that only the Other employs. They must repress this grotesque, everything unusual and difficult to consider. Dr. Seuss contained exactly that, the unusual, extraordinary things which were not often reflected on and were highly

disregarded. Geisel placed animal nature at the forefront through the creatures he used as characters, he challenged communication by bearing disdain for its foundation, and he ensured those things least important to the bourgeois – environmentalism, diversity – made it to the forefront through the sublime messages in his stories. But these stories were marginalized, only used by the Other. It followed that, "all that which the proper bourgeois must strive not to be in order to preserve a stable 'correct' sense of self," was that which was utilized by the Other (Stallybrass 104). By treating that which was marginalized, in this case the carnivalesque of Dr. Seuss, with disdain, then the bourgeois effectively repressed that which was marginalized as well.

Once the bourgeois had effectively restrained the carnivalesque through fragmentation, marginalization, and repression, it remained to pervade society but in a subtle way: through sublimation and subtle shreds of carnival surfacing in unexpected places, like a book. The Seussian universe is the sublime remains of the carnival as it lingers today. The carnival, of course, cannot be outright, obvious, or accepted as it is suppressed, so the sublime is that which still brings pieces of the carnival to permeate society. "The disjecta membra of the grotesque body of carnival found curious lodgement throughout the whole social order of the late nineteenth and early twentiethcentury… and this involved a degree of unpredictability in moment and surface of emergence. The 'carnivalesque' might erupt from the literary text," (Stallybrass 105). While in the books of Theodore Geisel readers may observe only shreds of the carnival, these texts, like everything else festive, have experienced fragmentation, marginalization, and repression. The simple notion that the carnival may be observed here is precisely what makes the literature of Dr. Seuss a sublime remembrance of the carnivalesque.

A return to the Seussian universe is perhaps the best way to conclude. In The Cat in the Hat (1957), Dr. Seuss wrote, "You will see something new. / Two things. And I call them / Thing One and Thing Two." In his text of a jovial and festive nature, Theodore Geisel presents the theory of Bourgeois Hysteria and the Carnivalesque. We see something new: the emergence of the bourgeois who will create a whole new lifestyle void of festivity and above the vulgarity of that which constitutes the Other. Call it thing one or thing two, for that is the irony, the Other will always be there, and we must have two things, for the Other – our sheer childlike enjoyment of Dr. Seuss – the festive, the pagan, the carnival, will never leave the new. And that, my friend, is why we find ourselves in the Seussian universe.

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Ashley French

(Department of Biology and Chemistry)

Candidate Diploid Yeast Mutants in Solid Media

Introduction:

Diploid yeasts' similarities with animal cells provides researchers with an important method of understanding cellular function and communication of eukaryotic cells. Yeast growth and a kind of asexual reproduction, sporulation, in biofilms has many commercial and medical implications. Biofilms form on medical devices and cause resistant infections. These infections are difficult to treat with antibiotics because of the structure and nature of biofims. This is a particularly challenging problem in patients that have artificial implants such as heart valves, prosthetic joints and even long term catheters and ports are highly susceptible to biofilm formation. Because of the difficulty at treating these infections, the most common result is the removal and replacement of the artificial equipment. The purpose of this experiment in Dr. Honigberg's laboratory at the University of Missouri in Kansas City is to isolate homozygous diploid yeast mutants that have defective sporulation in solid media and not in liquid media. Solid media sporulation is important over liquid media to select for mutants that are involved in biofilm formation on a hard surface. The results of this experiment were compared to two other laboratory's yeast sporulation in liquid media to determine which mutants sporulate in liquid media that do not sporulate in solid media. Three plates of 96 mutants were screened for defective sporulation out of 5000 mutants. These mutants' deleted genes are likely involved in solid media sporulation and communication.

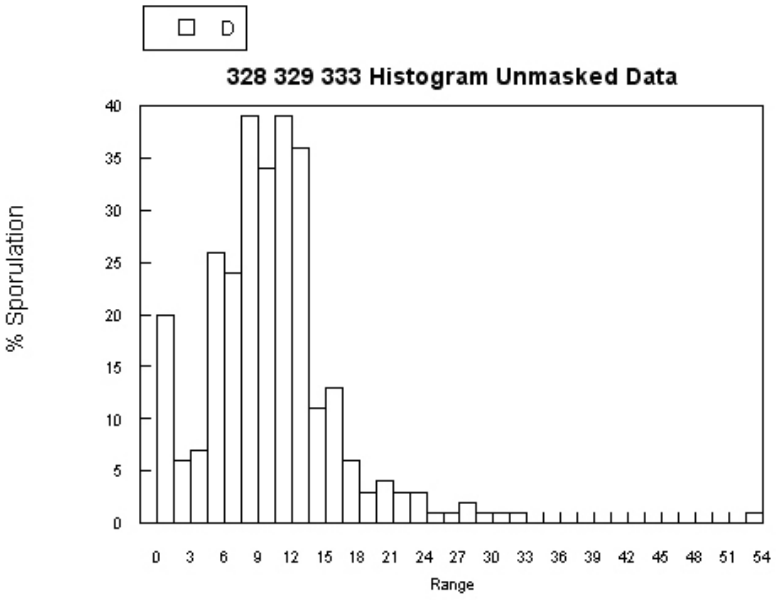
Methods:

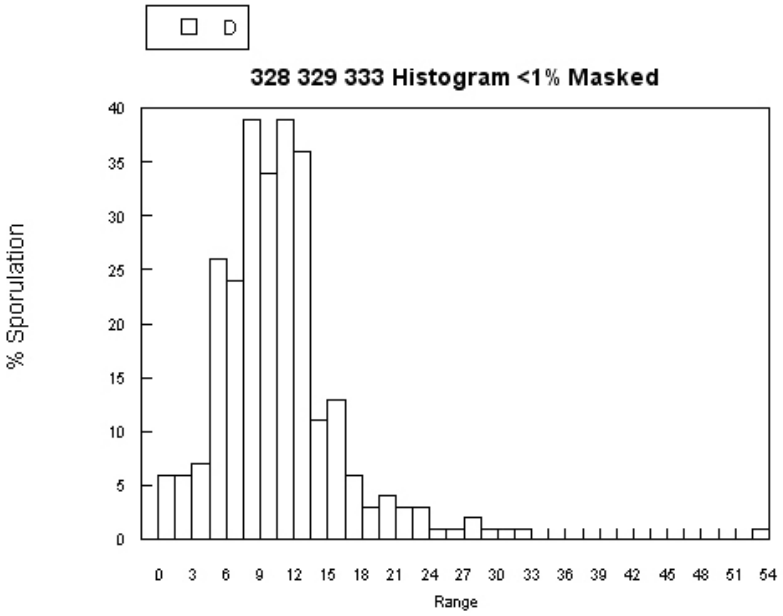
First, the plates that were to be studied in the 5000 mutants were removed from the laboratory's library in a freezer of -80° C and allowed to warm to room temperature. A plate with 96 wells was inoculated with 200μL of YPDA + tet. After the frozen plate was defrosted, a frogger dipped in ethanol and flamed was used to inoculate the wells. The well plate was then grown for 40 hours at 30° C. After the incubation time it was removed and inoculated to a new well plate that had 200μL of YPA + tet. This plate was then returned to the 30° C incubator for 72 hours. The YPDA well plates were then spun down

for 4 minutes at 2750 rpm. The 12 channel electronic pipettman was used to remove the liquid, leaving the cells in the bottom of the well. The cells were resuspended in 200µL of 50% glycerol. They were then covered with a sterile seal and restocked into the mutant library in the freezer.

After 72 hours of growth, the plates were removed from the incubator and the flamed frogger was used to spot onto three SPO+ye+glucose+aa plates. They were double wrapped with Parafilm and place in the 30° C incubator for two weeks. The plates were removed, and using a sterile pipette tip, the colonies were individually scraped off the media and placed into tubes with 200µL of sterile water. The mutants were then all counted individually under a microscope for sporulation. Approximately 200-250 cells were counted for each set of mutants. They were counted in three categories: tetrad (4), dyad (2), and vegetative (1) cells. These values were used to calculate the percent sporulation and recorded.

Results:

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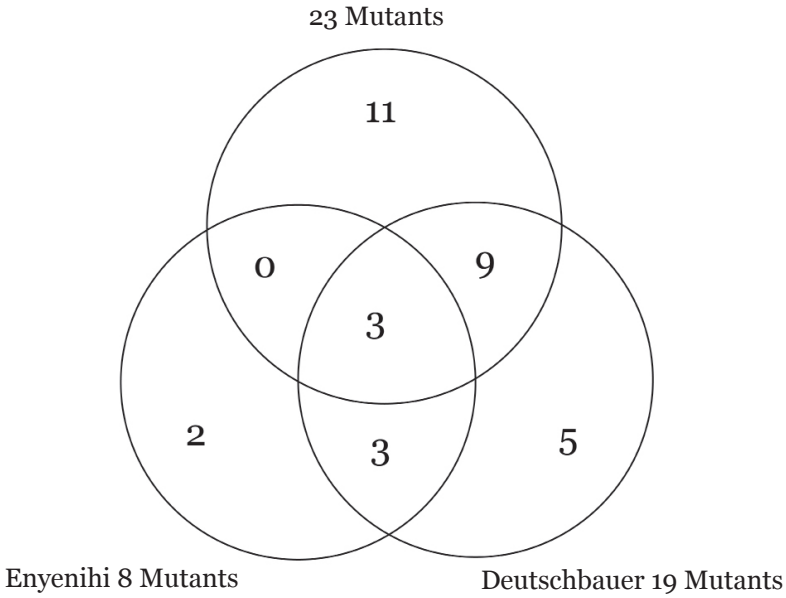
Range


23 Mutants
11
0
9
3
2
3
5
Enyenihi 8 Mutants
Deutschbauer 19 Mutants

The results of this experiment showed 23 mutants among the 288 tested. The Venn diagram above shows the overlap with Enyenihi and Deutschbauer in their experiments with sporulation mutants in liquid media. If a mutant was defective in liquid and in solid media it is not considered a candidate for solid media sporulation deficiencies. Twelve of Deutschbauer's and three of Enyenihi's had overlapping mutants. There were 11 mutants I found that were not identified as mutants by the other two laboratories liquid media sporulation experiments. Of these eleven, two did not show any growth, thus negating an opportunity to observe the sporulation amount, leaving nine candidates.

Unmasked Data: Points = 282.00 Mean = 10.185 Median = 9.80 Std Deviation 6.1259

Below 1% Masked Data: Points = 268.00 Mean = 10.704 Median = 10.000

Std Deviation 5.8352

The threshold for mutant determination was 1.5 standard deviation. 10.704-(1.5*5.835)=1.95

ORF	Record		Plate	row	col	
YFR010W	35689	1	06_1	328	D	6
YIR037W	35972	1	00_3	328	H	12
YKR070W	35986	1	00_3	329	A	10
YKR082W	35998	1	00_3	329	B	7
YMR062C	36195	1	00_6	329	B	9
YOL129W	36279	1	00_6	329	H	6
YOL138C	36288	1	00_6	329	H	11
YLR447C	36051	1	00_4	333	F	8
YMR060C	36069	1	00_4	333	G	10

Discussion:

The description of the functions of the nine candidate genes was interesting. Three of the genes had unknown function. YOL138C and YKRO7W are described as proteins of unknown function and YOL129W is described as a vacuolar membrane protein of unknown function. YFR010W is involved in protein deubiquination. YIR037W is a thiol perioxidase that responds to oxidative stress. YKR082W functions in DNA metabolic processes. YMR062 functions in the arginine biosynthic process. YLR447C is involved in vacuolar transport. YMR060C is a component of the outer mitochondrial membrane.

All of these genes have some effect on the sporulation of the yeast on solid media. It may be due to the lack of functioning machinery needed to go through the process of sporulation or defective

structural components for sporulation. It could also be caused by the lack of signaling or disrupted signaling. In liquid media there is approximately equal availability of nutrients and oxygen to all cells. However, in a solid colony, there is a striation of nutrients and of space. The inequality of location within the colony of solid media makes the cell-to-cell interactions more complex. Understanding the genes that regulate sporulation could help to understand the most basic pre-tissue interactions and how location affects a cells behavior.
Conclusion:

In conclusion, the results of this experiment after a comparison with two other laboratory's yeast sporulation in liquid media 9 mutants were found that did not sporulate on solid media. These mutants are the best candidates for father testing to determine the role of the gene deletion in sporulation. The mutants' deleted genes are likely involved in solid media sporulation and communication. After more testing, it may be possible to determine the specific role of each gene in sporulation in a solid media colony further understanding the complex communication between neighboring cells and their environment in biofims.

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The Changing Shape of Artemisia Scholarship

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About a film by Agnes Merlet, Griselda Pollock remarked, "Perhaps history should be understood as a domain of transference, projection, and fantasy that tells us more about ourselves, the dreamers, than about those about whom we do this projective and often identificatory dreaming."[1] Although the film, entitled *Artemisia*, was rife with historical inaccuracies, Pollock observed the key problem in the study of Italian Baroque painter Artemisia Gentileschi--our own ideas about her life story. The details that we know about her life, the rape as a teenager and the later abandonment of her husband, for example, lead to an often biased interpretation of Artemisia as an artist. Some interpretations, including Mary Garrard, presume that Artemisia contributed to proto-feminist epistemologies, working through an artistic medium for the equality of women. Others, such as R. Ward Bissell, rebuke the feminist standpoint and maintain that Artemisia depended on her father, Orazio, for artistic inspiration. Such vastly disparate views create a convoluted web of assumptions ranging from canonizing to denigrating the artist. The stigmatizations that remain contribute to an overwhelming confusion about Artemisia, begging for a reexamination of the known facts, scholarship and artworks themselves.

Many art historians have acknowledged the problems that plague Artemisia scholarship. Perhaps the largest obstacle of them all is separating her biography from her artistic oeuvre. Recently, novels, films and exhibitions have surfaced that attempt to make sense, in one way or another, of her story. Yet, myth intertwines with reality, and still it seems that we know little about her. Mary Garrard, Ward Bissell, Judith Mann and Keith Christiansen have all contributed to a large surge in scholarship over the past twenty years. Their work toward accurate attributions has led to a matrix of conflicting conclusions which climaxed during the 2002 exhibition of Orazio and Artemisia's work. Anticipated for years, I believe they all hoped that by gathering works together attributions could finally be solidified. However, attributions are as murky as ever before, and even Bissell has reattributed several works that he formerly thought

1 Grizelda Pollock, "Feminist Dilemmas with the Art/Life Problem." in The Artemisia Files: Artemisia Gentileschi for Feminists and Other Thinking People, ed. by Mieke Bal. (Chicago, IL: U. of Chicago Press, 2005). p. 177

to be by Artemisia to Orazio. Fortunately, innovations in Artemisia research have unfolded. Emphasis has been placed on studying the paintings and less on the documents from the rape trial. While the condition of some paintings and similarity between Orazio and Artemisia's technique have hindered scholars, innovative style interpretations have emerged that blur aesthetic and narrative components. Moreover, scholars have examined the tendency to identify self-portraits throughout Artemisia's oeuvre and acknowledge the consequence of doing so. All in all, there has been a shift in the past five years concerning the way in which we look at Artemisia's paintings, a vacillation that will hopefully lead to stronger conclusions in the future.

First, a brief overview of the known facts about Artemisia's artistic career should be explained in order to place her into the context of seventeenth century Italy. A bit of wanderlust, or perhaps a need for patrons, caused Artemisia to spend her life in Rome, Florence, Venice, Naples and London. Born and trained in Rome, she arrived in Florence, newly wedded shortly after the rape trial ended circa 1613. Here, the Buonarroti and Medici families patronized her.[2] By 1614, she became the first female to enter Florence's Accademia del Disegno.[3] During the 1620s, she lived again in Rome, working under the House of Savoy and Cassiano dal Pozzo. While in Rome, she worked closely with the Accademia dei Desiosi. Later, she relocated to Venice, where King Philip IV of Spain provided patronage. By 1630, she found herself in Naples, continuing work for Philip IV and his sister, Empress Maria of Austria, and for the third Duke of Alcala.[4] Thus, Artemisia worked for a variety of patrons, mingling with various artists on collaborative projects, and became a member of art academies throughout Italy. This could explain why her style changed so frequently, consequently problematic for present day historians ascribing attribution. More importantly, she became fairly well known. Simon Vouet, Antonio Colluraffi, and Jerome David created portraits and inscriptions that flatter her skill as an artist.[5]/[6] One might say, Artemisia attained a miner celebrity status in her time.

Scholars, however, critical of contemporary publicity, often analyze how Artemisia compared to her male counterparts. Richard Spear's research about the payment to baroque artists for works can assist this question. The Buonarroti patronized Artemisia's first documented commission in 1615, *Allegory of Inclination* (Fig. 1). Records

2 Elizabeth S. Cohen. "What's in a Name? Artemisia Gentileschi and the Politics of Reputation." In Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), P. 126

3 Cropper. Orazio and Artemisia Gentileschi. (Yale U. Press, 2001), P. 268

4 Cropper. Orazio and Artemisia Gentileschi. (Yale U. Press, 2001),, P. 269

5 Judith Mann. "The Myth of Artemisia as Chameleon: A New Look at the London Allegory of Painting." In Taking Stock. (Turnhout: Brepols, 2005), P. 52.

6 Cropper, P. 268

show that she received twenty-two florins for the piece, about average for work done for the Buonarotti.[7] However, this early voucher for equality decidedly turned against her by the end of her career. Documents dated in the 1630s consistently show that Ribera, Artemisia's top competitor in Naples, often earned twice the amount for comparable oil paintings that she created. Moreover, he typically received the public commissions. Yet in 1649, Artemisia wrote a letter that stated she regularly collected one hundred scudi per figure. If Artemisia's statement holds truth, she earned sums similar to Guercino, among the most highly praised Baroque painters. Artemisia, however, may have quoted an inflated price as a marketing negotiation in order to receive a higher commission.[8] While Spears's work on payments illuminates patron and artist relations, it appears not enough documented cases occur for scholars to make an accurate estimate of Artemisia's regular earnings.

As for artistic style, Garrard, creator of the first major monograph about Artemisia in 1989, placed Artemisia firmly within the realm of feminist activism. These roots, Garrard explained, extend back to around 1400 to the French woman Christine de Pizan.[9] Pizan advocated the education of women on the basis of intellectual equality to men. Garrard noted this time as the beginning of the *querelle des femmes*, a momentous movement towards equality that continued through the voice of humanist scholars. She also pointed to recent enthronements of women, beginning with Elizabeth I in the sixteenth century and Marie de' Medici and Anne of Austria of the seventeenth century, which created a stir of feminist and misogynist literature.[10] Against this backdrop, Garrard pointed to Lucrezia Marinelli and Arcangela Tarabotti as literary representations for feminist thinking in Venice during the seventeenth century.[11] Thus, Garrard attributed Artemisia's themes of heroism, such as *Judith Beheading Holofernes* (Fig. 2), to a flourish of feminist activity.

Yet Garrard failed to solidify any tangible connection between Artemisia and these powerful women. She argued that Artemisia, through the Medici in Florence between 1614 and 1620, could have been aware of the ideas circulating about feminist action.[12] Additionally, during Artemisia's stay in London, Marie resided at the court of Charles I. She also tenuously suggested that Artemisia's painting *Minerva* (ca.

7 Richard Spear. "Money Matters: The Gentileschi's Finances" in Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), P. 147

8 Richard Spear. "Money Matters: The Gentileschi's Finances" in Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005),. P. 149

9 Mary Garrard. Artemisia Gentileschi. (Princeton, NJ: Princeton U. Press, 1989). p. 142

10 Garrard. p. 156

11 Garrard,p. 151, 153

12 Mary Garrard. Artemisia Gentileschi. (Princeton, NJ: Princeton U. Press, 1989) p. 159

1615) truly depicted a portrait of Anne of Austria.[13] These comprise only a few of the numerous possibilities that Garrard raised in her monograph. Statements Artemisia elicited during the trial in 1612 expressed that she could barely read. Researchers do not know how accurately the statement represents reality for Artemisia's early years, although later she wrote eloquent letters to potential patrons. Moreover, class distinctions may have prevented her from engaging in feminist discussions with patrons. The core facts that support Garrard's premise that Artemisia gave feminist characteristics to her paintings lie in the interpretations of the paintings themselves and our assumptions about the effect of her alleged rape as a teenager. Naturally, how we believe the rape affected Artemisia plays a crucial role in how we interpret her paintings.

A reexamination of the rape trial documents conducted by Elizabeth Cohen avoids the often clichéd regurgitation in order to place them into a historical context. In 1611, Agostino Tassi, an associate of Orazio and teacher to Artemisia, allegedly deflowered the teenager in her home.[14] Nine months later, Orazio filed a civil suit against him which resulted in a seven month long trial. During this time Artemisia testified, verifying the truth through physical torture and answering questions posed by Tassi himself.[15] This form of a trial may appear to be cruel by our standards, but it was routine, and therefore expected by Artemisia. Cohen even suggested that Artemisia gave "legally calculated" testimony that she rehearsed beforehand, although it seems convincing when we read it.[16]

Moreover, the emotional effect of rape and the ensuing public trial probably did not have the adverse affects on Artemisia that we assume. Rather, damage amounted to the level of social and economic loss. If a victim won her case, a judge usually forced the rapist to marry her, thereby restoring social honor. Since Tassi was already married and hence unavailable, the judge ordered him to pay a fine to contribute to Artemisia's dowry.[17] Cohen emphasized that these proceedings showed no interest on individual trauma. She admitted that while Artemisia may have felt personally violated, it would be inaccurate for historians to assume that the event influenced her entire career. Placing the rape in historical context allows us deemphasize the significance that Garrard placed on it shaping her artwork.

13 Garrard p. 160

14 Elizabeth Cohen. "The Trials of Artemisia Gentileschi: A Rape as History." In *Sixteenth Century Journal*, vol. 31, No. 1 (Special Edition: Gender in Early Modern Europe. Spring, 2000), p. 47

15 Cohen, p. 59

16 Elizabeth Cohen. "The Trials of Artemisia Gentileschi: A Rape as History." In *Sixteenth Century Journal*, vol. 31, No. 1 (Special Edition: Gender in Early Modern Europe. Spring, 2000, p. 70

17 Cohen. p. 60

Moreover, several technical factors hinder scholars in their plight to understand Artemisia as an artist. For example, the condition of Artemisia's paintings must be taken into account. Because she painted on a darker ground than Orazio, certain color subtleties have been lost over time.[18] Furthermore, Mann pointed out that in Bissell's catalogue he estimated that 108 works were lost.[19] From the works we have, accurate dates are problematic, thereby creating even more difficulty when charting changes in Artemisia's style.

Furthermore, Orazio and Artemisia shared several stylistic characteristics that problematize attributions. For this reason, Bissell attempted to place Artemisia within a broader understanding of the role of Orazio. Orazio, her father and painting mentor, obviously played a large part in establishing Artemisia as an artist. Bissell acknowledged the similarities between Artemisia and Orazio. Their techniques for tracing and reusing images cause supreme difficulty when differentiating their work, especially when they painted in the same workshop during Artemisia's early career. Evidence shows that Artemisia attained a skill for painting at an early age. Documents from the rape trial insinuate that she taught painting by 1611.[20] Moreover, in a letter dated July 3, 1612, Orazio wrote, "Artemisia has in three years become so skilled that I can venture to say that today she has no peer; indeed, she has produced works which demonstrate a level of understanding that perhaps even the principal masters of the profession have not attained..."[21] Bissell believed, however, that Orazio wrote these words out of fatherly pride or as an agent to attract patrons for his daughter. In fact, Bissell supposed that Orazio resorted to deceptive measures in order to further his daughter's career.

The painting in question is *Susanna and the Elders* (Fig. 3), which Artemisia signed in 1610 as her debut into the art world as an adult. Now, scholars question how much she really contributed to the piece. Bissell, who attributed the piece primarily to Artemisia in his 1999 catalogue raisonee, has since withdrawn this attribution. An inventory from 1637 was published attributing the Spada *Madonna* (Fig. 4) and *Saint Cecilia* (Fig. 5) to Artemisia from around 1610. Bissell viewed these paintings as much lower-quality works, thus proving that Orazio painted a majority, if not all, of the *Susanna*.[22] On the other hand, a joint exhibition of Orazio Artemisia's work in 2002 strengthened Mann's attribution

18 Judith Mann, "Introduction". p. 11

19 Judith Mann, Orazio and Artemisia Gentileschi, also ed. by Keith Christensen. (New Haven, CT: The Metropolitan Museum of Art: NY/Yale U. Press, 2001). p. 260

20 Ward R. Bissell. "Re-Thinking Early Artemisia." In Artemisia Gentileschi: Taking Stock, (Turnhout: Brepols, 2005), P. 20

21 Bissell. p. 20

22 Ward R. Bissell. "Re-Thinking Early Artemisia." In Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), P. 22

to Artemisia. The *Susanna* hung next to the Detroit *Judith and Her Maidservant* (Fig. 6) and Mann saw several similarities in the handling of paint, drapery and palette.[23] Scholars' opinions vary drastically from one extreme to the other, but most agree that Orazio at least assisted his daughter while she painted.

Cleopatra (Fig. 7) also plagues attribution scholarship. At least three inventories, from 1780, 1792 and 1811, have attributed the painting to Orazio.[24] Presently, scholars, such as Mann and Garrard, attribute the painting to Artemisia, while others, such as Christiansen and Bissell maintain that Orazio deserves authorship.[25] An argument for Orazio can be found in a letter that Niccolo Tassi wrote to Galileo in 1615 in which he described a painting of Cleopatra in Orazio's studio. The description matches the painting that we now know.[26] Other arguments rely on comparing the treatment of drapery to Orazio's other work, although not all scholars acknowledge the similarities.[27] Furthermore, Bissell acknowledged the similarities between Orazio's lute player in the ceiling fresco in the Casino of the Muses. Thus, for Bissell, authorship of *Cleopatra* certainly must go to Orazio.

However, Harris pointed out the anatomical differences between the *Cleopatra* and other female nudes that Orazio painted around 1620, for example *Danae* (Fig. 8) and *Penitent Magdalene*.[28] The *Cleopatra* shows breasts that sag slightly with gravity rather than using geometric shapes placed at odd areas of the chest. She also compared the image to Artemisia's nudes from the 1610s such as *Allegory of Inclination* (Fig. 1) (another artist added drapery at a later date) and *Lucretia* (Fig. 9). These figures are more naturalistic with plump proportions and facial features that seem to dominant Artemisia's oeuvre.[29] Garrard further compared the piece to Artemisia's known works, and she concluded that the attribution can be made by studying the hands of figures.[30] While Orazio painted female hands elegantly, a tradition that dates back to Renaissance treatises of feminine beauty, Artemisia tended to depict hands in action, for example clutching something, in this case a snake, or playing a

23 Judith Mann. "The Introduction: Taking Stock of Artemisia and her Symposium." In Taking Stock. (Turnhout: Brepols, 2005), P. 3
24 Bissell. P. 23
25 Mary Garrard, "Artemisia's Hand." In Reclaiming Female Agency: Feminist Art History After Postmodernism. (U. California Press, 2005). p. 69-70
26 Bissell P. 23-24
27 Ann Sutherland Harris. "Artemisia and Orazio: Drawing Conclusions" in Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), 142
28 Ann Sutherland Harris. "Artemisia and Orazio: Drawing Conclusions" in Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), P. 142
29 Ann Sutherland Harris. P. 142
30 Mary Garrard, "Artemisia's Hand." In Reclaiming Female Agency: Feminist Art History After Postmodernism. (U. California Press, 2005). p. 64

musical instrument.[31]

The factor of painting female nudes should be investigated in order to understand the arguments against Orazio's attributions. Between 1500 and 1800, artists rarely studied female anatomy by using a live model.[32] However, male models often posed, and artists simply added female attributes, such as breasts and wider midsections. The practice of piecing together a female explains Orazio's odd positioning of these attributes. Scholars speculate that Artemisia, as a female painter, had access to female models.[33] If not, she at least had access to her own body and features, which some insist emerge in her work. These factors explain why Artemisia would be adept in portraying works such as *Allegory of Inclination* (Fig. 1) and *Susanna and the Elders* (Fig. 3). Scholars, however, question whether Orazio, too, had access to a female model. During the trial in 1612, a witness statement accused Orazio of using Artemisia as a nude model.[34] The validity of this statement is controversial; perhaps the witness only wanted to discredit both Orazio and Artemisia and amounts to mere slander. Yet, this idea introduces certain questions about various nude paintings that may be attributed to Orazio.

Similar in composition to *Cleopatra, Danae* (Fig. 10) poses as many questions of attribution. In 1986, the Saint Louis Art Museum acquired the piece as a work completed by Orazio.[35] Importantly, this work is oil on copper, which has been preserved much better than canvas. Thus, paintings on copper can sometimes provide a more adequate representation of an artist, although they are much smaller in size. Orazio kept copper paintings as records of his works, and in 1637 he gave a set of plates to Charles I.[36] Artemisia, however, also used copper paintings to keep records. An inventory of her belongings taken in 1621 showed that at that time she possessed at least three copper paintings.[37] Also, because the pose is nearly identical to that of *Cleopatra*, scholars have assumed that the same artist completed both pieces. Since Bissell reattributed *Cleopatra* to Orazio, he also believes that Orazio painted *Danae*. His reasoning for attributing the former painting continues to dominate his argument for the latter. He also noted that the headdress of the servant appears similar to one found in a previous Judith painting,

31 Mary Garrard. p. 65
32 Ann Sutherland Harris. P. 142
33 Ann Sutherland Harris. P. 143
34 R. Ward Bissell. "Re-Thinking Early Artemisia." In Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), P. 24
35 Judith Mann. "The Introduction: Taking Stock of Artemisia and her Symposium." In Taking Stock. (Turnhout: Brepols, 2005), P. 1
36 Ann Sutherland Harris. "Artemisia and Orazio: Drawing Conclusions" in Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), P. 133
37 Judith Mann, Orazio and Artemisia Gentileschi.(Yale U. Press, 2001) , P. 305

and the profile is comparable to one found in the Oslo Judith piece.[38] The arguments surrounding attribution for *Susanna*, *Cleopatra* and *Danae* represent a larger body of scholarship in which debates about Artemisia's oeuvre run rampant. The problem of using traditional, aesthetic approaches can easily become a vicious cycle, often rooted in value laden opinions as to who was the better artist, Orazio or Artemisia. Once that question dominates, it seems that a warped sense of the particular contributions or adaptations an artist makes prohibits a deeper understanding of the art itself. Thus, a new mode of looking must be utilized, especially in the case of Orazio and Artemisia, whose styles overlap so easily and limited facts are known.

Mann developed a new way to view Artemisia's work that scholars have embraced. Rather than concentrate on the particular narratives Artemisia painted, generally stereotyped as feminist, Mann fused subject with aesthetics. The key, according to Mann, is the interpretive moment Artemisia chose to depict.[39] Artemisia's paintings typically display a moment of contemplation just before an action occurs during the story, rather than during or after a climactic event.[40] Thus, in the case of *Susanna*, the painting demonstrates the pivotal moment when she chose to risk death rather than submit to the elders. In *Cleopatra*, she has not yet allowed the asp to bite her. *Danae*'s particular timing has been disputed. Mann has proposed that it is the moment after she submits to Zeus; however, another interpretation explains that it could be a moment of resistance.[41] Both interpretations coincide by expressing a philosophical thought process, which differs from contemporary depictions of the story.

Although Mann concurred that Artemisia did not initiate a certain style, she called for study of Artemisia as a stylistic adaptor.[42] Thus, when we consider Artemisia as a business woman attempting to gain commissions, this skill would be extremely useful. Throughout Artemisia's career, her painting style varied dramatically as she adapted to particular variables of location and patron. However, the narrative moment captured by Artemisia which reflected the psychological meditations just before an action appears to occur continuously.

Some scholars interpret Artemisia's work by correlating the particular narratives that she depicted with her own life. Bal argued that this method exploits her biography, drawn largely from the trial documents of

38 Judith Mann, P. 305

39 23 Judith Mann. "The Introduction: Taking Stock of Artemisia and her Symposium." In Taking Stock. (Turnhout: Brepols, 2005), P. 302-303

40 Judith Mann, P. 302-303

41 Jeanne Morgan Zarucchi. "The Gentileschi 'Danae': A Narrative of Rape." In *Woman's Art Journal* (vol. 19, No. 2), p. 13-14

42 Judith Mann. "The Introduction: Taking Stock of Artemisia and her Symposium." In Taking Stock. (Turnhout: Brepols, 2005), p. 9

1612. Consequently, past scholarship emphasizes the possibility that Artemisia made statements about feminism by depicting her own portrait as Susanna, Judith, Lucretia, Cleopatra and other mythical or Biblical characters.[43] Scholars have thereby interpreted her work as auto-biographical, through what Bal called allo-portraiture.[44] In other words, if Artemisia portrayed herself as allegorical figures, the possibility of social commentary takes place. The problem, according to Bal, occurs because historians study these connections in Artemisia's work while disregarding them in contemporary artists' work, such as Orazio.[45] Thus, she called for more equal analysis of Artemisia and Orazio's paintings.

The tendency to focus on allo-portraiture can be found in analysis of two allegories of painting. The first example at the Musee de Tesse, Le Mans, although attributed to Artemisia, proves controversial. Some scholars question why Artemisia painted a self-portrait in such an erotic style. According to Garrard and Bissell, the answer is, quite simply, that she did not.[46] As a possibility, they suggest that she found herself caught between a long standing feud between Orazio and Baglioni. Baglioni sued Orazio and Caravaggio around 1610 for libel, and Bissell suggested that he painted this *Allegory* alluding to Artemisia as revenge.[47] If so, then the London *Allegory* (Fig. 11) might conceivably be Artemisia's reaction against the painting, albeit, probably at least two decades later. Mann pointed out the significance of a gold chain that dominated the London piece. A patron gave Baglioni a chain of honor, which prompted Orazio and Caravaggio to write about "the chain of gold that he wears unworthily around his neck."[48] Indeed, if Artemisia painted the London piece to spite her opponents, she also chose a very difficult pose in which to do it. In order to paint her self, a complex set-up of at least two mirrors would have been necessary, thus flaunting her skill for all to see.[49]

On the other hand, the London *Allegory* may not be a self-portrait of Artemisia after all. For example, she depicted herself with black hair when previous self-portraits showed auburn. One explanation could be that Artemisia adapted to a description that Cesare Ripa wrote in 1593 that elaborated the physical attributes an allegory of painting

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43 Mieke Bal. "Grounds of Comparison." In The Artemisia Files: Artemisia Gentileschi for Feminists and Other Thinking People. (Chicago, IL: U. of Chicago Press, 2005) P. 138

44 Mieke Bal. P. 141

45 Mieke Bal, P. 143

46 Mary Garrard, "Artemisia's Hand." In Reclaiming Female Agency: Feminist Art History After Postmodernism. (U. California Press, 2005), p. 68

47 Judith Mann. "The Myth of Artemisia as Chameleon: A New Look at the London Allegory of Painting." In Taking Stock. (Turnhout: Brepols, 2005), p. 58-59

48 Judith Mann. p. 58-9

49 Judith Mann. p. 57

should possess.[50] He wrote:

A beautiful woman, with full black hair, disheveled, and twisted in various ways, with arched eyebrows that show imaginative thought, the mouth covered with a cloth tied behind her ears, with a chain of gold at her throat, from which hangs a mask, and has written in front 'imitation'. She holds in her hand a brush, and in the other the palette, with clothes of evanescently coloured drapery.[51]

Judging by the similarities between Ripa's description and Artemisia's painting, it is fairly safe to deduce that she created an allegory that followed the rules, so to speak. In fact, when Artemisia sold her belongings in 1621, there were no mirrors inventoried, let alone two. As expensive items, to settle her debts she surely would have contributed a mirror to her other belongings which included furniture, palettes and partially completed canvases.[52] Also, when compared to the Detroit *Judith*, the maidservant and La Pittura have similar postures, lighting and fabric, suggesting that she reused a former modello.[53]

It seems that wherever a scholar glimpses the generic Artemisia face, most easily identified by dark hair, he or she correlates the piece with a piece of biographical information, as I have just demonstrated. Paintings depicting Judith or Susanna, consequently, have been given extra emphasis by correlations to Artemisia's rape as a teenager. Bal and Mann, however, believe a differentiation must occur between true self-portraits and representations of another using the self image as a model.[54] Bal believes that by focusing on self-images, historians have ignored Artemisia as an artist and persist to intertwine her biography into every aspect of her art.[55] Bal also questioned Orazio's use of Artemisia's image in paintings such as *Lot and his Daughters* (Fig. 12). She pointed out that most scholars simply gleam over Artemisia's presence by maintaining that she played a role and did not represent the real person. However, she disagrees that one can derive meaning from one allo-portrait and not another. She wrote, "Either we sever the ties between life and representation in both cases, or we sever them in neither."[56] In fact, Bal believed that the comparisons between Artemisia and Orazio's work has been created in overwhelmingly unequal ways. She

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50 Judith Mann. p. 51

51 Judith Mann. "The Myth of Artemisia as Chameleon: A New Look at the London Allegory of Painting." In Taking Stock. (Turnhout: Brepols, 2005)," p. 51

52 Ann Sutherland Harris. "Artemisia and Orazio: Drawing Conclusions" in Artemisia Gentileschi: Taking Stock. (Turnhout: Brepols, 2005), p. 142

53 Ann Sutherland Harris. p. 141

54 Mieke Bal. "Grounds of Comparison" in The Artemisia Files: Artemisia Gentileschi for Feminists and Other Thinking People. (U. of Chicago Press, 2005). P. 139

55 Mieke Bal. P. 138

56 Mieke Bal. "Grounds of Comparison" in The Artemisia Files: Artemisia Gentileschi for Feminists and Other Thinking People. (U. of Chicago Press, 2005).P. 143

warned against the tendency to judge works of art rather than objectively compare. When scholars have made attributions based on the idea that Orazio must have been better, for he was her teacher, an automatic bias excludes the possibility that Artemisia was a talented and innovative artist. She believed, as Mann, that Artemisia depicted narratives at a different moment than other artists. She called this an intellectual style, one that merged stylistic aesthetics and cultural background.[57] If scholars deemphasize allo-portraiture and turn toward an equal evaluation of paintings, more objective comparisons can be made between Artemisia and contemporary artists' works.

Analysis of the trends used by scholars to study Artemisia shows the difficulty faced in placing her within the art historical cannon. Beginning with Garrard, who perhaps sought out Artemisia because of possible links to early feminism, paved the way with emphasis on her sex and violent images of femme fatale. While she attempted to correct centuries of misguided art historical analysis by contributing a female, she undermined her own agenda by concentrating on the sexualized nature of Artemisia's work. She tenuously created links to literature and high ranking patrons and supplied little evidence with which to fortify it. Bissell, writing a decade later, attempted to remedy the shape of Artemisia's work by comparing it to Orazio's paintings. While attempting to place her within a context of her contemporaries, Bissell, perhaps inadvertently, brushed against value judgments, which tainted his view about Artemisia. Perhaps his re-attributions of some of Artemisia's most prominent works to Orazio demonstrate how easily we fall into the teacher student scenario, where assumptions run rampant again. These assumptions, in my opinion, threaten Artemisia's place in the art historical canon, and therefore must be avoided.

Thus, in the midst of research that seems to be up in arms, steady progress has been made in an attempt to grasp Artemisia as an artist. While Garrard, Bissell, Mann and Christiansen paved the way in the late twentieth century, new emphasis has been attached to their work as more scholars revisit the problematic nature of Artemisia studies. Even these founders have been flexible. Attributions still conflict, and scholars sway from one to another, ceaselessly searching for answers. Inventories and statements from the trial seem to help little, for their reliability is questionable, and at times they have been proven to be inconsistent. Perhaps humbled by disenchanted quests to seek confirmation of what scholars might like to believe about Artemisia, they have returned to the basic source for art historical study—the paintings themselves. This has led to new investigations into the narrative moments that Artemisia depicted. If Artemisia chose to freeze narrative moments that other artists did not,

57 Mieke Bal, "Introduction" in The Artemisia Files: Artemisia Gentileschi for Feminists and Other Thinking People. (Chicago, IL: U. of Chicago Press, 2005) P. xx

this could lend tremendously to understanding her style in continuity. Moreover, if the questions about allo-portraits are not analyzed quite so arduously as in the past, attributions can avoid reflection about her biography. Perhaps one day we will find documents that confirm our ideas, but most importantly, interest is still cultivated, and students continue to watch as Artemisia scholarship, no doubt, morphs from shape to shape.

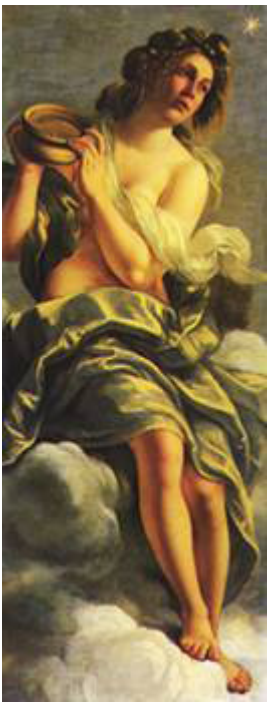

Figure 1: Artemisia, Allegory of Inclination, c. 1615, Casa Buonarroti, Florence.

Figure 2: Artemisia, Judith Beheading Holofernes, 1620, Uffizi, Florence.

Figure 3: Artemisia, Susanna and the Elders, 1610, Pommersfelden.

Figure 4: Artemisia, Madonna and Child, c. 1610, Galleria Spada, Rome.

Figure 5: Artemisia, Saint Cecilia, c. 1615, private collection.

Figure 6: Artemisia, Judith and her Maid-servant, c. 1625, Detroit Institute of Arts.

Figure 7: Artemisia or Orazio, Cleopatra, c. 1620, Milan.

Figure 8: Orazio, Danae, c. 1621, Cleveland Museum of Art.

Figure 9: Artemisia, Lucretia, c. 1621, Private collection.

Figure 10: Artemisia, Danae, c. 1615, St. Louis Art Museum.

Figure 11: Artemisia, Allegory of Painting, c. 1630s, Royal Collection, Windsor.

Figure 12: Orazio, Lot and his Daughters, c. 1621, Madrid.

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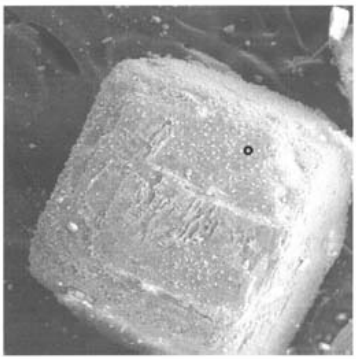
Jennifer L. Nielsen

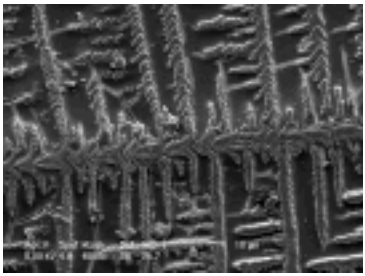
(Department of Physics)

Microcosmic Forests: An Investigation of Protein Crystallization Using ESEM, Contact AFM and Optical Microscopy

"With every step, I topple microscopic forests."
-Chet Raymo, Professor Emeritus of Physics, Stonehill College, Easton, Massachusetts



SEM view of typical salt crystal – courtesy http://acept.la.asu.edu/PiN/rdg/elmicr/salt.jpg



SEM image of salt & BSA proteins courtesy Dusevich lab, UMKC

Introduction

Proteins, one of the key building blocks of life, are often crystallized as an aid in studying their macromolecular structure via X-ray diffraction and electron microscopy. However, crystallization in general, and protein crystallization in particular, are intriguing phenomena, some details of which—even today—are still not well understood (Kimber 1).

When sodium chloride crystallizes in the presence of a protein, the salt's typical cubic shape is converted into an extensively branched dendritic form (Anderson and Reid).
Furthermore, when such branched or ferned crystals are found occurring naturally in certain biological substances such as blood or saliva, their

appearance indicates the presence of a protein and thus may be used as a diagnostic protocol in medicine (Anderson and Reid). A theoretical understanding of how these protein crystals actually form is still a young and developing area of biological science (Fraden). By investigating the size, shape, and texture of these crystals, scientists hope to gather information about the structure of proteins, as well as the electrochemical interactions and other force interactions which occur between proteins and their solutions during crystal formation.

While building a working theory of protein crystal formation is obviously beyond the scope of our undergraduate group, we were interested in investigating the topography/structure of NaCl crystals formed in the presence of proteins. We wanted to know more about:

* The terrain of the crystals (Are they rough? Are there peaks and valleys in the pattern?)
*How far does the classic fractalline or ferning pattern extend--or in other words--the size of the smallest branch in the crystal's fractal tree.

We hoped (perhaps ambitiously) to find evidence for what causes the crystals to form in a fractalline manner.

Additionally, we wanted to investigate any important differences in structure between bovine serum albumin (BSA) exposed crystals, bovine serum albumin exposed crystals to which urea has been added, and the protein-exposed crystals sometimes found in human saliva. According to prior research, “the more heterogeneous the composition [of the solution], the more elaborate the pattern” of crystallization formed in the dried solution (Anderson and Reid). We wanted to verify the research. We hypothesized that crystals formed in biological environments, as well as crystals formed in the laboratory with more molecules—such as urea—present, would give rise to more complex looking crystal structures.

In order to observe crystals in close detail, microscopes beyond the range of conventional optics were necessary, as optical microscopes cannot be used to scan areas smaller than the wavelength of visible light. The magnified viewing range of optical microscopes is at best 200nm (Flegler 1). An electron microscope or other advanced microscope would thus be necessary for our study.

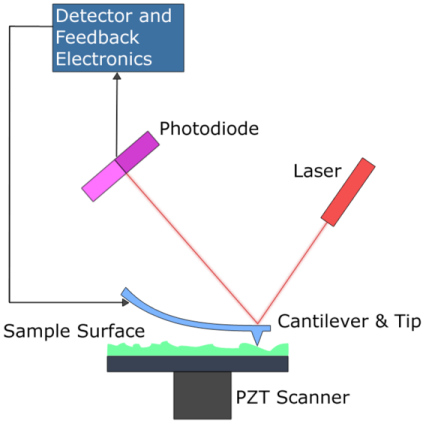
The first electron microscope, the TEM (Transmission Electron Microscope), was developed in Germany during the 1930’s by scientists Max Knoll and Ernst Ruska at the High Voltage Laboratory in Berlin. Electrons, a particle much smaller than photons, were directed at a sample to form an image with much greater resolution than a photon based optical instrument could provide.

With a resolving power of about 0.2 nm, the TEM produces images which may be magnified 100 to 500,000 times (Flegler 43). TEM makes use of an accelerating voltage to generate an electron beam. The accelerating voltage of a TEM theoretically improves the resolution, and ranges from 20,000 to as high as 1,000,000 volts (Flegler 50). The specimen is inserted into the objective lens, which is the most important, master lens in TEM. After the electron beam is produced, the beam travels in vacuum through a condenser-lens system, which is "used to control electron illumination on the specimen and on the viewing screen for such functions as viewing, focusing, and photography" (Flegler 51). The image is produced by contrast forming specimen-beam interactions. Amplitude, diffraction, and phase contrast are made use of to form and refine the created image. Some electrons pass through the sample without energy loss or change of direction, whereas others are elastically or inelastically scattered. More insight into the sample's structure is possible as the prominence of the diffraction pattern increases. The final image magnification in a TEM is the product of "the objective lens, the diffraction lens, the intermediate lens, and the projector lens...[which] projects the final image onto the viewing screen." (Flegler 59). Vacuums are necessary to produce a coherent electron beam, however the vacuum environment places constraints on what type of samples may be viewed as they must be resistant to the vacuum.

The next electron microscope developed was the Scanning Electron Microscope (SEM). It was first developed and used in 1965. In the SEM, secondary electrons "are produced by interactions between incident electrons and weakly bound conduction band electrons in the atoms of the sample" (Flegler 72). Through the process of absorption and escape, these secondary electrons "produce a predominantly topographical image" (Flegler 73). As these secondary electrons "escape from a small volume of the total specimen-beam interaction volume, the secondary electron image provides the image of highest resolution (73). An Everhart Thornley detector detects nearly all of the secondary electrons that escape from the surface of the specimen, and these electrons are then accelerated and converted into photons by a scintillator. The photons strike an electrode, which then emits electrons. The electrons bounce back and forth in a cascading manner, each bounce causes the electrons to be multiplied in the photomultiplier tube.

The secondary electron image produced by the Everhart Thornley detector "is a complex mixture of electrons of different origins." (Flegler 74). The secondary electrons coming directly from the region of specimen-beam interaction in the sample have the highest resolution capacity because they originate from the smallest volume in the sample. Sample current, voltage contrast, electron-beam induced current, and

magnetic contrast may also be used to create images in SEM.



Two more exciting recent developments in microscopy are the Atomic Force and Scanning Tunneling Microscopes. The AFM, or "Atomic Force Microscope", is not an electron microscope. Instead of using an electron beam to image a sample, a fine mechanical probe scans the sample's surface (Flegler 93). In STM, electrons tunnel between the tip of the probe and the sample, which do not directly touch. In the AFM, a very fine tip is mounted on a triangular piece of metal called the cantilever, and the piezoelectric device moves the sample under the tip. (See figure courtesy Wikipedia.) The variation in attractive forces between the electrons in the orbital shells of the tip and the electrons in the sample cause the cantilever to move. A laser beam hits the foil and is then reflected back onto a photodiode. The current in the photodiode varies with the movement, and this variation is used to create an image. (Flegler 94).

In Atomic Force Microscopy, samples do not need to be conductive, and samples are not required to be in a vacuum. AFM microscopes "have been used to image amino acids, proteins, and macromolecules" but "many difficulties remain to be solved...before these new microscopes can be used fully in biology" (95).

The Investigation

For our investigation, we utilized an ESEM Philips XL30 microscope at the Dusevich lab at UMKC Dental School, and an XE-100 AFM microscope in contact mode at the Zhu lab in the UMKC Physics Department.

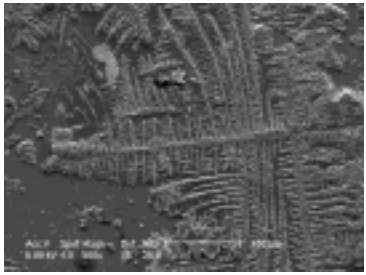
ESEM "retains all of the performance advantages of a conventional SEM, but removes the high vacuum constraint on the sample environment" (Kimsen and Meissel 2). While much analysis of SEM samples is done within the magnification range of a light microscope, the total information content of the SEM can be much greater due to its higher

resolution and much greater depth of field.

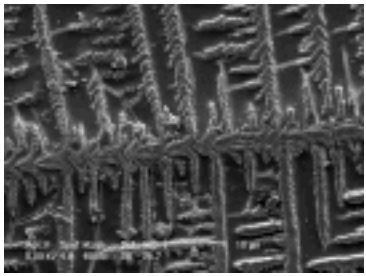
For example, here is a 400X magnification of crystallized sodium chloride solution in the presence of bovine serum albumin (.15 M NaCl and 10 mg/mL Bovine Serum Albumin):

(Taken in the Ferrari lab by Jennifer Nielsen using
Nikon Eclipse TS100 phase contrast inverted light microscope)

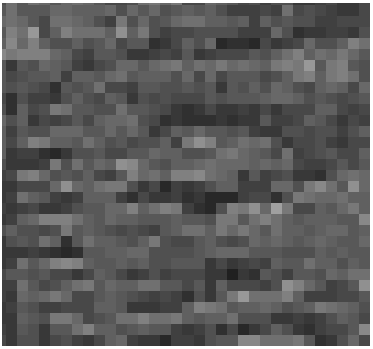
Here is the same substance at 500X magnification using the ESEM in the Dusevich lab (after treatment with a 60% gold / 40% palladium alloy):



And here is the same substance magnified 4000X using the ESEM:



The enhanced detail resulting from the improved magnification and depth of field is staggering. Whereas it is almost impossible to distinguish the smallest branches in the fractal pattern using optical microscopy alone, at 4000X magnification using ESEM, the fractal pattern is enlarged significantly enough that the smallest branches become discernible.



Note the fractures in the underlying film of dried solution on the slide which only come into view under the highest magnification. Which came first, the crack or the crystals, may be an entirely meaningless question, but the crystals appear on first glance to be following the course of the cracks. The cracks bare a resemblance to Lichtenberg figures—lightning-like shapes that are often a sign of a complex process called diffusion-limited aggregation (Hasley). According to the diffusion based theory of crystal formation, "dendrites…can appear in the crystal growth in a diffusion field. When a part of the flat interface grows faster than the other by some fluctuation the advanced part can grow faster owing to a gradient (e.g. of concentration) in the diffusion field, and the deformation is enhanced. Hence, the flat interface becomes unstable, resulting in dendrites"—fernlike branches (Taguchi 1.)

The question now, is why these fluctuations are occurring with the solutions containing proteins, and not the plain salt solutions. It is likely that the fractures and fractal crystals most likely occur simultaneously, due to underlying tensions occurring in the solution as it dries. These tensions are likely occurring due to some type of interaction between the proteins, salts, and the evaporating water, and may be at least partly electrochemical in origin. According to a recent publication, "Water and protein molecules have electrostatic properties…[that] interact and… mutually adjust…" having "a significant effect on…the structural and the dynamical properties of the solvating water in the vicinity of charged residues" (Kim 1). The cracks in the film may thus be a result of the electrochemical effects of hydrophobic and hydrophilic regions of proteins on the local structure of water molecules in the solution. Clearly this is

speculation at best at this point, and more research is necessary.

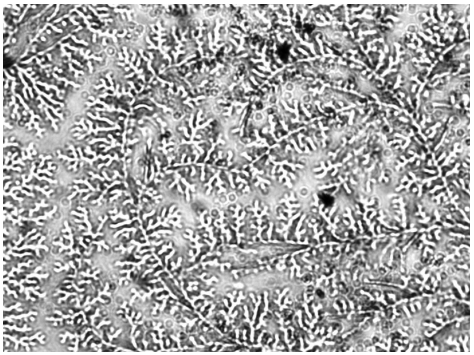
It is interesting to note that, after we go down to the level of just a few square micrometers, the fractal pattern seems to stop repeating itself. This was further verified using the XE-100 Atomic Force Microscope in the laboratory of Dr. Da-Ming Zhu.
The AFM microscope provided us with an excellent close-up view of both BSA/salt crystals like the ones we viewed under ESEM, as well as biologically occurring saliva crystals.

The saliva crystals, gathered from dried saliva of a female student, are believed to have been caused by levels of proteins which rise during ovulation (Reid). Saliva contains more components than our lab-mixed bovine serrum albumin crystals. As expected, intricate patterns were observed in a more heterogeneous mixture.

(Female student's Saliva crystals; 400X magnification)

Note the unusually "curly" appearance of the saliva crystals. It is noted that human saliva normally contains urea (Dawes). Having observed similar effects in urea exposed crystals before, we hypothesized that the additional presence of urea may account for the "curly" structure of protein crystals found in human saliva. Urea is a denaturant which increases protein solubility. "Despite its widespread use, the molecular basis for urea's ability to denature proteins remains unknown. Urea may exert its effect directly, by binding to the protein, or indirectly, by altering the solvent environment" (Bennion and Daggett).

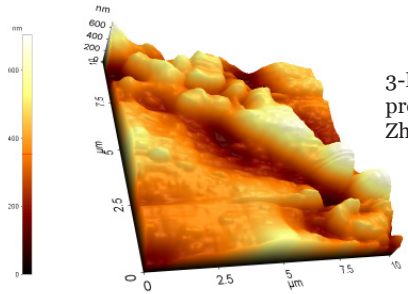
To check whether urea caused the curling, we mixed a batch of NaCl/BSA protein solution to which urea has been added. Sure enough, the curly structure was again found:



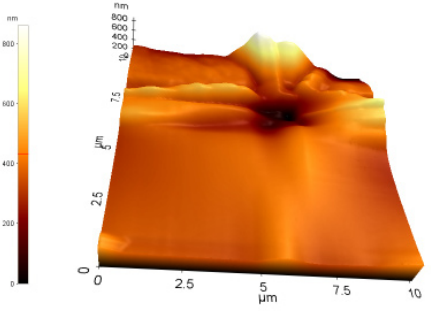
400X magnification using optical microscope, Ferrari lab, UMKC
.15 M NaCl and 10 mg/mL Bovine Serum Albumin +5 mg/mL urea

(The curling structure is even more pronounced here than in the human saliva sample, which may or may not be due to a much higher concentration of urea in our lab mixed sample than in human saliva.)

Our AFM images reveal that the biologically derived crystals from saliva were smaller than the BSA derived crystals—in particular, less tall (only about 400 to 700 nanometers in height versus the BSA crystals' maximum height of 900 nm). I think this is because there was most likely less protein and less salt present in the saliva than was present in our laboratory mixed batches.

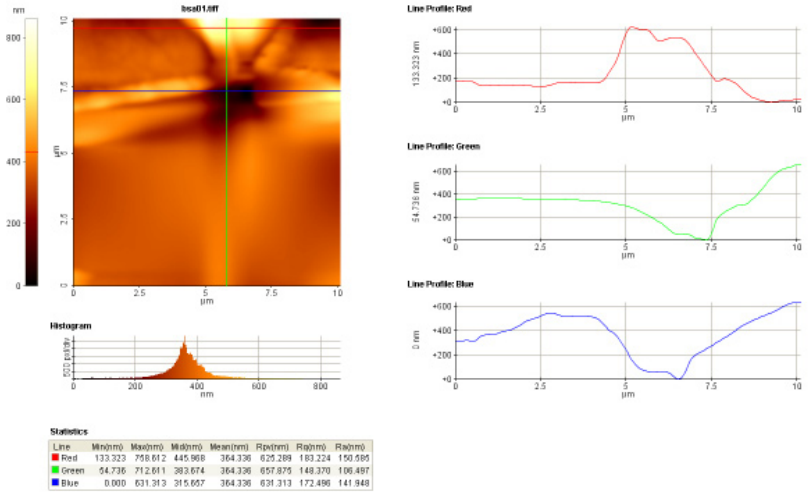


3-D AFM image of naturally occurring protein crystal found in saliva; courtesy Zhu lab; note complex structure



3-D AFM image of lab created bovine serum albumin
Crystal; courtesy Zhu Lab

BSA crystal – “Line Profile” – Courtesy Zhu Lab

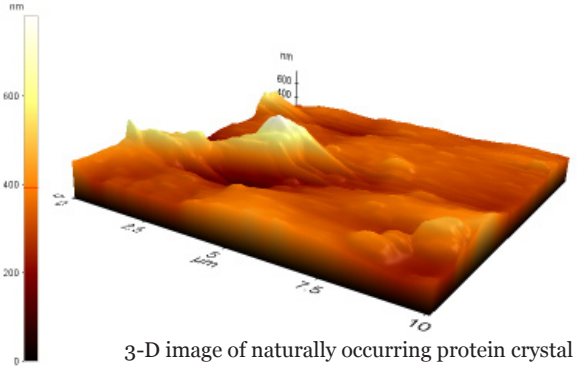


Total region statistics for BSA crystal:

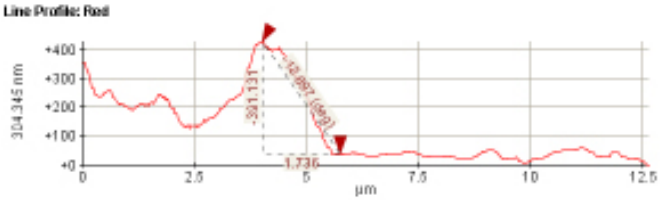
Statistics

Region	Min(nm)	Max(nm)	Mid(nm)	Mean(nm)	Rpv(nm)	Rq(nm)	Ra(nm)
Red	0.000	862.522	431.261	364.336	862.522	86.403	54.856

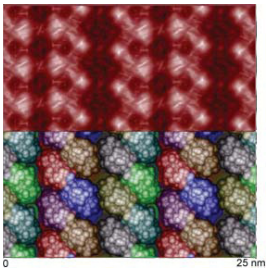
From the line profile and region profile of the BSA crystals which we obtained during image processing, we can observe details about the crystals’ exact width, height, and slope. For instance, we can see that the smallest BSA (bovine serum albumin) salt crystals observed were about 2.75 micrometers wide, and close to 900 nm tall. It is important to note in these 3-D pictures that each crystal can be seen as a hill rising up from a surrounding valley or gorge. I believe that the dark crevice around the crystal segments as seen in the AFM images are actually the same as the cracks in the surface film like those noted in the ESEM pictures.

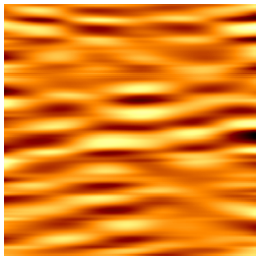


3-D image of naturally occurring protein crystal found in saliva



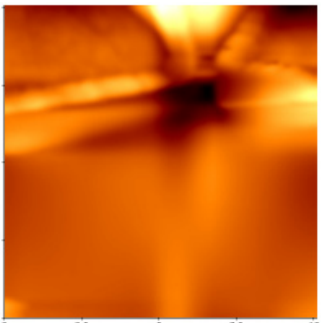
As demonstrated here, AFM can be used to provide a 3-D images of samples, unlike the electron microscopes, which provide images in 2-D. Additionally, samples viewed using AFM do not require special metallic treatments that may irreversibly change or damage the sample. Disadvantages of AFM are that the images size is limited and that at high resolution, image quality may be affected by the radius of curvature of the probe tip. An incorrect choice of tip for the required resolution may lead to image artifacts. AFM is not an unusual choice for viewing protein crystals. “The mechanisms by which crystals of [biological] macromolecules grow are quite varied and complicated. The AFM, by probing the crystal surface in situ with a sharp tip, allows direct observation of these mechanisms” (Lonnert). Using some AFM’s with even higher magnification than we made use of in our project, it is even possible to actually reveal the molecular structure of a protein, as in this picture from a recent paper on protein structure, reproduced here (Lonnert 1).

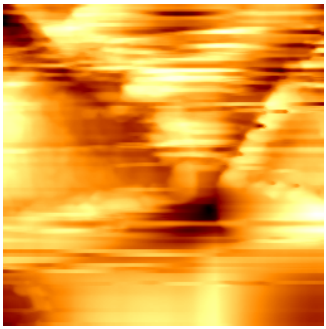




After observing biological crystals and plain BSA crystals, we wanted to view our urea exposed BSA/salt crystals under AFM. We unfortunately ran into some difficulty. This is the image that AFM took of BSA and urea. We concluded with our graduate student supervisor O-Sung Kwon that there are most likely a number of artifacts in this image. We hypothesize that either the probe tip was scratching the surface of the crystal and causing the lines, or the lines were caused by scanning errors due to abrupt shifts in the depth of the terrain.

We encountered similar difficulty—albeit to a lesser extent—in one of our shots of the plain BSA crystals.





In our first shot of the BSA salt crystals, the image came through beautifully.

In our second shot, the errors and artifacts were compounded. Note that there is a good deal more terrain to cover in the second shot. It is possible that the abrupt changes in the terrain are what caused the errors; I ruled out actual physical scratching of the terrain, as the first shot is beautifully captured with no scratching and the surface's texture should not have significantly changed in the time between the shots.

There are a number of possibilities for the exact cause of the artifacts. These artifacts may have been caused by constructive interference between the reflection of the laser from the tip of the probe, and the reflection from the sample. This effect often registers as broad stripes in the AFM images (Eaton). Also, a common cause of artifacts is sample height versus size of the tip (Velegol). Sound waves in the room are another possible cause of image artifacts.

If abrupt terrain shifts are what is causing the line errors, this may explain why the BSA and urea shots, which had the most variable terrain, came up with the highest amount of error.

Conclusion

Our group concluded that AFM and ESEM are an excellent combination for studying the topography of protein crystals. AFM provide clear and crisp 3-D closeup images, while ESEM provides the best overall aerial view of the overall crystal topography. With more time and effort, we could have perfected our methods of taking protein images and learned much more about their structure. We would furthermore have been able to precisely determine the cause of the artifacts and eliminate them from future images. However, this was beyond the scope of our undergraduate level class.

Our findings seem to support the Reid hypothesis that crystals formed in the presence of more diverse solutions are more variable in shape. Our evidence furthermore seems to support the diffusion-limited aggregation

model of protein crystal formation.

Electron microscopes, as well as STM and AFM microscopes, reveal vast quantities of information that are unavailable using conventional optical microscopy. Through ESEM and AFM, new worlds of information about protein crystals and other microcosmic forests can be revealed.

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Vibrational Spectra and Structural Parameters of Some XNCO (X=H, F, Cl, Br) Molecules

Abstract: *Ab initio* calculations with full electron correlation by the perturbation method to second order and hybrid density functional theory calculations by the B3LYP method utilizing the 6-31G(d), 6-311+G(d,p), and 6-311+G(2d,2p) basis sets have been carried out for the XNCO (X = H, F, Cl, Br) molecules. From these calculations, force constants, vibrational frequencies, infrared intensities, Raman activities, depolarization ratios, and structural parameters have been determined and compared to the experimental quantities when available. By combining previously reported rotational constants for HNCO, ClNCO and BrNCO with the *ab initio* MP2/6-311+G(d,p) predicted structural values, adjusted r_o parameters have been obtained. The r_o values for BrNCO are: r(Br–N) = 1.857(5); r(N=C) = 1.228(5); r(C=O) = 1.161(5) Å; ∠BrNC = 117.5 (5) and ∠NCO = 172.3(5)°. For ClNCO the determined r_o parameters are in excellent agreement with the previously determine r_s values, whereas those for HNCO the HNC angle is larger with a value of 126.3(5)° compared to the previous reported value of 123.9(17)°. However, considering the relatively large uncertainty in the value given initially the two results are in near agreement. Predicted values for the barriers of linearity are given for both the XNCO and XOCN (X = H, F, Cl, Br) molecules and the results were compared to the corresponding isothiocyanate molecules. The predicted frequencies for the fundamentals of the XNCO molecules compare favorably to the experimental values but some of the predicted intensities differ significantly from those in the observed spectra.
Keywords: *ab initio* calculations, infrared and Raman spectra, r_o structural parameters, XNCO and XOCN (X = H, F, Cl, Br) molecules.

Introduction

Recently, several [1-6] spectroscopic studies supported by *ab initio* and density functional theory calculations of some YN_3 [1,2] and YNCS [3-6] molecules (Y = organic, silyl, germyl or halogen moiety) have been reported. Since the YNC angle is relatively large or in some cases linear, the NCS moiety has nearly free or free rotation which significantly effects the vibrational and rotational spectra. For example, the barrier to

internal rotation for methylisothiocyanate (CH_3NCS) is ~3 cm^{-1} which results in essentially free rotation of the methyl group with the degeneracy of the two NCS bends [5]. In the infrared spectrum of the gas phase, two of the antisymmetric (pseudodegenerate) vibrations of the CH_3 groups have resolvable fine structure where the spacing is 9.8 cm^{-1} for the stretch and 13.8 cm^{-1} for the deformation where the spacing is determined by the zeta values for these normal modes for the CH_3NCS molecule [5]. Also the two NCS bends give a very strong broad infrared band in the gas and liquid along with a much weaker lower frequency band. In the infrared spectrum of the solid the very broad band essentially disappears leaving the single lower frequency band which may indicate a linear CNCS. This very low C-NCS torsional barrier for the methyl compound is also found for the corresponding ethyl compound [6] which results in a single stable *cis* conformer (CH_3 group *cis* to the NCS moiety) for this molecule which is at variance from the predictions form *ab initio* calculations up to TZVP [7]. Because of these large amplitude vibrations for these type of molecules, it has frequently been difficult to assign their microwave spectra from which rotational constants can be obtained for determining the r_o or r_s structural parameters. However, it is frequently possible to combine a limited number of experimentally determined rotational constants with *ab initio* predicted structural parameters to obtain r_o structural parameters that have significantly smaller uncertainties than those obtained from the microwave spectral data [8]. Such results have been obtained for HN_3 [1], CH_3N_3 [2], HNCS [3] and GeH_3NCS [5].

Since the $\angle$XNC (X = H, CH_3) for the isocyanate is significantly smaller [9, 10] than the corresponding angles for the XNCS [3, 5] molecules, it is expected that the barrier to linearity will be much larger for the corresponding isocyanates. Also the N=C distances may be significantly different between isocyanate and the corresponding isothiocyanate molecules. Therefore, as a continuation of these spectroscopic and theoretical investigations, a similar study of XNCO where X = H, F, Cl, and Br was carried out for comparison to the corresponding isothiocyanate (NCS) molecules. The results of these theoretical studies along with comparisons to the experimental data when appropriate are reported herein.

Theoretical Calculations

In order to provide vibrational frequencies with both infrared and Raman intensities and optimized geometries, *ab initio* calculations were carried out by using the Gaussian-98 program [11] at both the restricted Hartree-Fock (RHF) level and by the perturbation method to second order (MP2) [12] with full electron correlation. Three basis sets, 6-31G(d), 6-311+G(d) and 6-311+G(2d) have been utilized. Hybrid density functional theory (DFT) calculations have also been carried out by the B3LYP method utilizing the 6-311+G(d) basis set. Frequencies for the fundamentals have

been predicted for the XNCO (X = H, F, Cl, Br) molecules, along with the predicted infrared and Raman activities and these data are listed in Table 1. The predicted values are compared to the experimental values when they are available.

In order to obtain a complete description of the molecular motion involved in the normal modes, the force field in Cartesian coordinates was calculated with the 6-31G(d) and 6-311+G(d) basis sets at the MP2 level as well as with 6-311+G(d) basis set from the hybrid DFT calculations by B3LYP method. The internal coordinates were the X–N, N=C, and C=O distances, the XNC and NCO angle bends, and the out-of-plane angle bend for the isocyanates and X–O, O–C and C N distances, the XOC and OCN bends, and the out-of-plane bend for the cyanates. The symmetry coordinates were these internal coordinates individually, except the C=O and N=C coordinates for antisymmetric and symmetric stretches was combined for the isocyanates. The **B** matrix was used to convert the *ab initio* force field in Cartesian coordinates to a force field in internal coordinates [13].

Table 1. Calculated[a] frequencies (cm^{-1}) and potential energy distributions (PEDs) for XNCO (X = H, D, F, Br, Cl).

						IR Intensity[b]	
	ν	Description	MP2/6-31G(d)	MP2/6-311+G(d)	B3LYP/6-31G(d)	MP2/6-31G(d)	MP2/6-311+G(d)
HNCO							
A'	ν_1	N-H stretch	3732	3726	3733	169.6	166.3
	ν_2	NCO asym stretch	2376	2342	2316	506.3	676.8
	ν_3	NCO sym stretch	1316	1304	1293	0.4	0.05
	ν_4	HNC bend	779	768	811	266.3	215.1
	ν_5	NCO bend	567	562	577	81.9	101.6
A''	ν_6	NCO bend	618	627	633	0.8	0.5
DNCO							
A'	ν_1	N-D stretch	2762	2749	2726	205.7	201.4
	ν_2	NCO asym stretch	2346	2317	2312	453.6	629.0
	ν_3	NCO sym stretch	1297	1286	1318	0.8	1.4
	ν_4	DNC bend	694	698	703	82.4	61.8
	ν_5	NCO bend	471	458	457	108.2	109.2
A''	ν_6	NCO bend	602	611	621	8.8	6.8
FNCO							
A'	ν_1	NCO asym stretch	2257	2252	2253	344	438.7
	ν_2	NCO sym stretch	1287	1285	1308	0.4	1.2
	ν_3	N-F stretch	911	891	875	46.7	67.1
	ν_4	NCO bend	699	707	712	7.4	6.6
	ν_5	FNC bend	196	212	214	10.7	12.6
A''	ν_6	NCO bend	517	533	540	15.6	14.7
ClNCO							
A'	ν_1	NCO asym stretch	2311	2296	2266	635.5	791.8
	ν_2	NCO sym stretch	1347	1340	1325	4.9	5.4
	ν_3	N-Cl stretch	702	706	694	30.2	29.1
	ν_4	NCO bend	611	615	617	2.3	1.4
	ν_5	ClNC bend	166	163	153	12.1	11.9
A''	ν_6	NCO bend	540	558	564	20.0	17.1
BrNCO							
A'	ν_1	NCO asym stretch	2298	2285	2271	703.8	881.0
	ν_2	NCO sym stretch	1319	1317	1348	11.9	12.4
	ν_3	NCO bend	676	680	680	17.3	17.7
	ν_4	N-Br stretch	509	519	491	0.3	0.5
	ν_5	BrNC bend	135	136	136	6.5	6.8
A''	ν_6	NCO bend	550	565	577	17.2	15.5

[a] For HNCS and DNCS the basis sets included p orbitals for the H and D atoms.
[b] Calculated infrared intensities in km/mol.
[c] Raman activities in $Å^4/u$.
[d] Frequencies for HNCO Ref. [24], DNCO [15], ClNCO and BrNCO [30].
[e] Frequencies for FNCO Ref. [26], BrNCO Ref. [35].
[f] Calculated with MP2/6-31G(d) and contributions of less than 10% are omitted.
* Indication of misassignment in an earlier investigation [25].

	Raman Activity[c]				Obs		
B3LYP/6-31G(d)	MP2/6-31G(d)	MP2/6-311+G(d)	B3LYP/6-31G(d)	Scaled	Gas[d]	Matrix[e]	P.E.D.[f]
170.5	86.2	88.2	83.5	3540	3538.3		$99S_1$
782.1	0.1	3.0	2.1	2254	2268.9		$99S_2$
0.5	33.5	43.3	27.4	1316	1322.6		$100S_3$
199.0	5.9	7.1	6.2	779	776.6		$76S_4$, $24S_5$
97.5	0.8	0.8	0.7	567	577.4		$76S_5$, $24S_4$
3.5	0.7	0.3	0.4	618	656.3		$100S_6$
227.8	37.9	39.0	36.4	2620	2634.9		$91S_1$
710.4	0.9	3.3	3.1	2226	2235.0		$92S_2$
0.7	34.2	43.5	28.4	1297	1310.0		$100S_5$
64.6	3.1	4.1	3.4	694	766.8		$64S_5$, $37S_4$
99.1	0.7	1.2	1.1	471	460.0		$64S_4$, $36S_5$
12.9	1.0	0.3	0.4	602	602.9		$100S_6$
567.8	11.3	19.7	17.2	2141		2174.8	$98S_1$
2.4	8.6	10.8	7.3	1221		1245.0	$80S_2$, $18S_5$
79.8	13.9	18.0	18.6	864		860.8	$79S_3$, $15S_2$
9.2	2.5	3.9	3.5	699		701.5	$56S_4$, $36S_5$
13.6	2.1	2.4	2.0	196		203.5*	$67S_5$, $35S_4$
20.7	0.7	0.2	0.3	517		533.8*	$100S_6$
918.8	14.8	24.3	19.3	2192	2212.2		$99S_1$
2.5	13.4	16.5	8.1	1278	1306.6		$80S_2$, $15S_3$
32.8	20.3	19.5	11.4	702	707.7		$78S_5$, $18S_2$
0.8	11.0	12.9	22.9	611	607.7		$54S_4$, $35S_5$
10.5	2.9	3.8	3.2	166	~230.0		$67S_5$, $36S_4$
23.7	0.5	0.1	0.1	540	559.0		100_6
1035.3	22.2	33.0	25.2	2180	2198.0	2196.0	$99S_1$
6.6	14.8	18.9	8.6	1251	1294.5	1290.8	$91S_2$
22.6	7.8	9.4	8.3	676	687.7	691.1	$79S_3$, $10S_4$, $10S_5$
0.5	23.2	24.2	28.3	509	—	506.0	$88S_4$, $10S_3$
6.9	3.0	3.8	3.1	135	—	137.4	$91S_5$, $11S_5$
22.4	0.3	0.01	0.002	550	569.9	572.2	$100S_6$

The frequencies from the MP2/6-31G(d) calculation were also calculated by utilizing a set of scaling factors of 0.88 for the N–H (N–D) stretches, 0.9 for HNC (DNC) bends, and 1.0 for all other coordinates with the geometric average for the off-diagonal terms for HNCO. Except for the acid, the potential energy distributions (P.E.D.s) are expressed in terms of the symmetry coordinates where: S_1 is NCO antisymmetric stretch, S_2 is the NCO symmetric stretch, S_3 is the X–N stretch, S_4 is the NCO bend, S_5 is the XNC bend and S_6 is out-of-plane bend; these potential energy distributions are listed in Table 1. For the acid, S_1 is N–H (N–D) stretch, S_2 is NCO antisymmetric stretch, S_3 is the NCO symmetric stretch, S_4 is HNC (DNC) bend, S_5 is NCO bend and S_6 is the out-of-plane bend. The pure *ab initio* frequencies, infrared intensities, Raman scattering activities, along with the B3LYP/6-311+G(d) calculation results are also given in Table 1.

In order to show the differences in the predicted and observed spectra for the fluoro-, chloro- and bromoisocyanates as well as the difference in the infrared and Raman spectra for the hydrogen and halocyanates, we calculated the theoretical infrared and Raman spectra. The calculated frequencies, infrared intensities, and Raman scattering activities were obtained from both the *ab initio* and hybrid DFT calculations. Infrared intensities were calculated based on the dipole moment derivatives with respect to the Cartesian coordinates. The derivatives were taken from the *ab initio* calculation and transformed to the normal coordinates by $(\partial\mu_u/\partial Q_i)=[\sum(\partial\mu_u/\partial X_j)]L_{ij}$, where Q_i is the i^{th} Cartesian displacement coordinate, L_{ij} is the transformation matrix between the Cartesian displacement coordinates and normal coordinates. The infrared intensities were then calculated by: $I_i = [(N\pi)/(3c^2)]\,[(\partial\mu_x/\partial Q_i)^2+(\partial\mu_y/\partial Q_i)^2+(\partial\mu_z/\partial Q_i)^2]$.

For HNCO and DNCO, mainly the predicted infrared and Raman spectra are shown in Figure 1. In Figs. 2–4, the predicted infrared spectra from the MP2(full)/6-31G(d) calculations are shown for each XNCO (X = F, Cl, Br) molecule. For comparison the experimental infrared spectra of the gas or in a matrix are also shown. The observed ones show some slight differences from the predicted ones for these molecules.
An analytical gradient method has been developed [14, 15] for the evaluation of the Raman activity. Where the activity, S_j, can be expressed as: $S_j = g_j\,(45\alpha_j^2+7\beta_j^2)$ and g_j is the degeneracy of the vibrational mode j, α_j is the derivative of the isotropic polarizability, and β_j is that of the anisotropic polarizability. The Raman scattering cross sections, which are proportional to the Raman intensities, can be calculated from the scattering activities [16,17]. To obtain the polarized Raman cross sections, the polarizabilities are incorporated into S_j by multiplying S_j with $(1-\rho_j)/(1+\rho_j)$, where ρ_j is the depolarization ratio of the j^{th} normal mode. The

Raman scattering cross sections and the calculated frequencies were used together with the Lorentzian function to obtain the calculated spectrum. The predicted Raman spectrum for the individual molecules is shown below the infrared spectrum, but only the experimental one for BrNCO is conveniently available for comparison.

Vibrational Spectra and Structural Parameters

The predicted vibrational spectra for the XNCO (X = H, D, F, Cl, Br) molecules are shown in Figs. 1–4 and it should be noted that in general there are significant differences in the predicted intensities of the lower frequency bending modes of the infrared spectra and those in the Raman spectra. For example, with BrNCO, the ν_4 fundamental is barely observable in the infrared spectrum but it is the strongest Raman band. Similarly the ν_6 mode is extremely weak in the Raman spectrum but the third strongest band in the infrared spectrum. Some similar differences are also predicted for the other XNCO molecules (X = F and Cl). Thus, these data could be of significant importance for any future Raman studies of the other halocyanates. However, infrared and Raman data as well as experimental structural data are available for isocyanic acid.

3.1 Isocyanic acid (HNCO and DNCO)

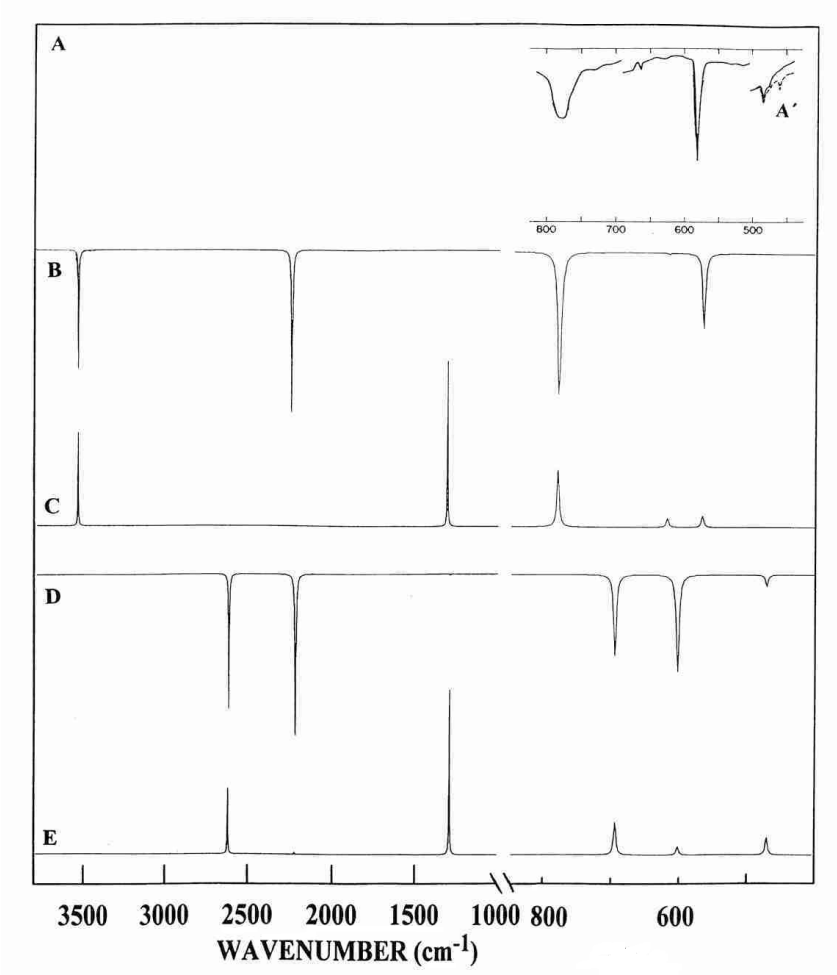

Fig. 1 Vibrational spectra of HNCO and DNCO: (A) experimental (Ref. [38]) infrared spectrum of HNCO in nitrogen matrix; and (A') HOCN spectrum generated from HNCO; (B) simulated infrared and (C) Raman spectra of HNCO from MP2/6-31G(d) calculation; (D) simulated infrared and (E) Raman spectra of DNCO from MP2/6-31G(d) calculation. Note scale changes.

The predicted infrared spectrum of HNCO from scaled MP2/6-31G(d) calculations is shown in Fig. 1B and that for DNCO in 1D, and the corresponding Raman spectra are shown in 1C and 1E, respectively. The predicted intensities for ν_2 in the Raman spectra makes them almost unobservable compared to the other Raman line intensities whereas the corresponding symmetric NCO stretch (ν_3) is the most intense Raman line with the corresponding infrared band extremely weak as might be expected from a comparison of these corresponding modes of CO_2. Because of this exceedingly small intensity, this mode was misassigned in the early infrared investigation [18] with a frequency of 1527 cm^{-1}. The question concerning the correct assignment for ν_3 should not have occurred since this mode was clearly observed by Goubeau [19] in the Raman spectrum. The predicted Raman intensity of this fundamental is the second highest (Table 1), and is only exceeded by the predicted intensity of the NH stretch and the only other fundamental with significantly predicted Raman intensity is the HNC bend. There was also some controversy concerning the assignment for the HNC bend (ν_4) as well as the out-of-plane NCO bend (ν_6, A˝). For example, ν_6 was assigned at 777.1 cm^{-1} [20] which was later supported by *ab initio* SCF calculations [21] that was in agreement with earlier CNDO/2 calculations [22]. However, the higher level calculations (Table 1) clearly show that the out-of-plane mode is the band at 656.3 cm^{-1}, but again the intensity is extremely small which undoubtly contributed to the earlier misassignment.

The potential energy distributions for ν_4 and ν_5 for HNCO and DNCO are rather interesting where, for the deuterium compound, there is 64% contribution of the NCO bend (S_5) to the higher frequency band at 767 cm^{-1} whereas for the hydrogen compound the corresponding band at 777 cm^{-1} is 76% HNC bend (S_4). The halocyanate NCO bend is heavily mixed with the XNC bend for the fluoro- and chloro- compounds as well as with the X-N stretches. However, this mixing is relatively small for the bromide. Therefore the simple descriptions of the three bands below the symmetric NCO stretch for the haloisocyanates do not give a very good indication of the atom displacements for these modes.

TABLE 2. Structural parameters,[a] rotational constants, dipole moments and energies for HNCO.

Parameter	RHF/6-311+G(d,p)	MP2/6-31G(d)	MP2/6-311+G(d,p)	B3LYP/6-311+G(d,p)	Microwave [23]	Microwave [9][c]	Adjusted r_0
r(H–N)	0.994	1.009	1.007	1.006	0.986	0.995(6)	0.995(3)
r(N=C)	1.197	1.224	1.224	1.212	1.209	1.214(3)	1.216(3)
r(C=O)	1.139	1.184	1.172	1.166	1.166	1.166(1)	1.165(3)
∠HNC	124.3	125.8	123.2	126.2	128.0	123.9(17)	126.1(5)
∠NCO	174.4	171.1	171.6	172.8	(180)[b]	172.6(27)	172.6(5)
A	876,748	884,244	827,323	903,406	912,712	918,504	918,423
B	11,483	10,816	10,951	11,078	11,071	11,071	11,057
C	11,335	10,686	10,808	10,944	10,910	10,910	10,925
$\|\mu_a\|$	1.544	1.857	1.700	1.690	1.575(5)		
$\|\mu_b\|$	1.681	1.767	1.767	1.523	1.35(10)		
$\|\mu_c\|$	0.0	0.0	0.0	0.0	0.0		
$\|\mu_t\|$	2.282	2.563	2.452	2.275	2.07(10)		
-(E+167)	0.814554	1.232429	1.368556	1.738737			

[a] Bond distances in Å, bond angles in degrees, rotational constants in MHz, dipole moments in Debye and energies in Hartree.
[b] Assumed.
[c] Modified substitution method

The structural parameters for HNCO have been obtained from two microwave studies [9, 23] with relatively low uncertainties for the distances but with larger uncertainties for the HNC and NCO angles of 123.9 ± 1.7° and 172.6 ± 2.7°, respectively (Table 2). In the initial microwave study [23], NCO was assumed to be linear with a relatively large ∠HNC of 128.0° and a very short N=C distance of 1.209 Å. Later the microwave data was reanalyzed by using a modified substitution method along with a nonlinear NCO which resulted in more reasonable angles but with relatively large uncertainties. We have combined the *ab initio* predicted parameters from the MP2/6-311+G(d,p) calculations along with the previously reported rotational constants [23] from the following isotopes ^{15}N, ^{13}C, ^{18}O, and D as well as with the normal species to obtain the five structural parameters. The values we obtained for the HNC angle is 126.1 ± 0.5°, and 172.6 ± 0.5° for the NCO angle, both of which are nearly in agreement with the values previously reported but with smaller uncertainties. Also it should be noted that the values obtained from the *ab initio* MP2/6-311+G(d,p) calculations as well as those from the B3LYP/6-311+G(d,p) calculations are in reasonable agreement with the experimental values but different from the theoretical values previously reported [24] with the smaller 6-31G(d,p) basis set.

3.2 Fluorine Isocyanate (FNCO)

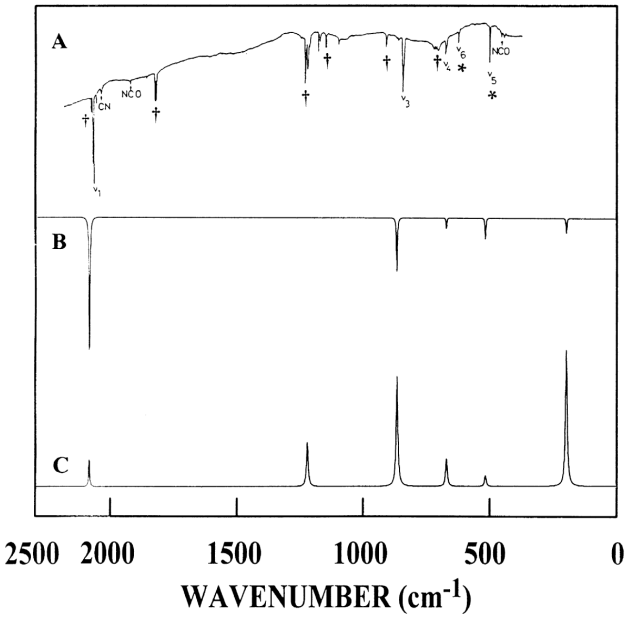

Fig. 2 Vibrational spectra of FNCO: (A) experimental infrared spectrum (Ref. [25]) from argon matrix obtained by UV photolysis of $FC(O)N_3$; † spectrum of precursor; * the original assignment of ν_6, later reassign to ν_5 band; simulated spectra from MP2/6-31G(d) calculation (B) infrared and (C) Raman.

The initial infrared spectrum of FNCO was reported by Gholivand et al. [25] from an argon matrix where the sample was generated by UV-photolysis of $FC(O)N_3$ and five of the six fundamentals were assigned (Fig 2). The NCO symmetric stretch (ν_2) was not assigned but as can be seen from the *ab initio* predicted spectrum this fundamental is predicted to be very weak (Fig. 2B) as might be expected from the similar mass for the oxygen and nitrogen atoms and their electronegativities. The predicted frequency is expected to be the lower limit since this mode is predicted too low for all of the other XNCO molecules investigated herein. Initially there were two modes (ν_5, ν_6) which were misassigned with the weak band at 646 cm^{-1} (Fig. 2A marked with an asterisk) assigned as ν_6 but it is obvious that this band is not a fundamental. The band at 529 cm^{-1} which was previously assigned [25] as ν_5 is in fact ν_6, the out-of-plane NCO mode, and ν_5 is predicted to have a frequency of 196 cm^{-1} which was

beyond the range of their spectroscopic investigation at the time. Later in a reinvestigation [26] of the infrared spectrum of FNCO including ^{15}N, ^{13}C, and ^{18}O isotopic species by utilizing a neon matrix, ν_5 was observed at 203.5 cm^{-1} and ν_6 reassigned to the band at 533.8 cm^{-1} (Table 1).
The predicted intensities for the four observed fundamentals shown in Fig. 2 agree very well with the observed values. It is probable that the predicted intensities for the Raman lines would also agree well with the Raman data if the spectrum were recorded. Finally the extensive mixing of two of the A' modes should be noted. Therefore, to refer to one of them as the FNC bend (Table 1) is an over simplification since this mode is extensively mixed with the NCO bend. A similar problem is also found for the in-plane NCO bend of the corresponding chlorine molecule.

TABLE 3. Structural parameters,[a] rotational constants, dipole moments and energies for FNCO.

Parameter	RHF/6-311+G(d)	MP2/6-31G(d)	MP2/6-311+G(d)	B3LYP/6-311+G(d)	Adjusted r_0
r(F–N)	1.361	1.418	1.403	1.409	1.406(5)
r(N=C)	1.233	1.262	1.258	1.246	1.248(5)
r(C=O)	1.127	1.176	1.166	1.157	1.158(5)
∠FNC	111.0	110.7	112.0	112.6	112.6(5)
∠NCO	173.5	168.9	169.1	169.8	169.8(5)
A	59087	58268	61291	61592	61479
B	5312	4901	4917	4944	4947
C	4874	4520	4552	4577	4579
$\lvert\mu_a\rvert$	0.978	0.740	0.876	0.806	
$\lvert\mu_b\rvert$	0.376	0.412	0.411	0.344	
$\lvert\mu_c\rvert$	0.0	0.0	0.0	0.0	
$\lvert\mu_t\rvert$	1.048	0.847	0.968	0.876	
-(E+266)	0.571179	1.144187	1.350977	1.898154	

[a]Bond distances in Å, bond angles in degrees, rotational constants in MHz, dipole moments in Debye and energies in Hartree.

No structural studies have been reported for FNCO so it was not possible to obtain adjusted r_0 parameters from the *ab initio* predicted values but we have some estimated r_0 parameters (Table 3). To determine the expected quality of the NF distance we have carried out some *ab initio* calculations on some other NF containing molecules: F_2C=NF, HNF_2, and CH_3NF_2 where the NF distances have been experimentally determined [27, 28, 29, respectively]. The predicted NF distances were compared to those experimentally determined by the same basis sets and level of calculations used to predict the parameters for FNCO. For

F_2C=NF the MP2(full)/6-311+G(d) calculations predicted the NF distance within 0.002 Å which was the listed uncertainty of the experimental determination. For the HNF2 molecule the predicted distance was too short by 0.009 Å but the B3LYP calculation with the same basis set gave a predicted NF distance of 0.003 Å. A similar results was obtained for the CH_3NF_2 molecule.

Therefore, we believe the NF distance for FNCO should be somewhere between the predicted value of 1.403 Å for FNCO from the MP2 calculations (Table 3) and 1.409 Å from the B3LYP calculations, *i.e.* 1.406 Å.

3.3 Chlorine Isocyanate (ClNCO)

The infrared spectrum of gaseous ClNCO has been reported [30] and five of the fundamentals were assigned from observed bands with the low frequency ClNC bend (ν_5) estimated at ~230 cm^{-1} from combination and difference bands (Table 1). However as can be seen from the predicted frequency of 166 cm^{-1} for this fundamental, this estimated frequency is entirely too high. Based on the predicted frequencies for the FNC and BrNC bending modes compared to the observed values it is expected that the ClNC bend should be within the estimated value of 166 ± 4 cm^{-1}. The predicted frequencies for the other fundamentals have errors similar to those found for the corresponding vibrations for the FNCO molecule.

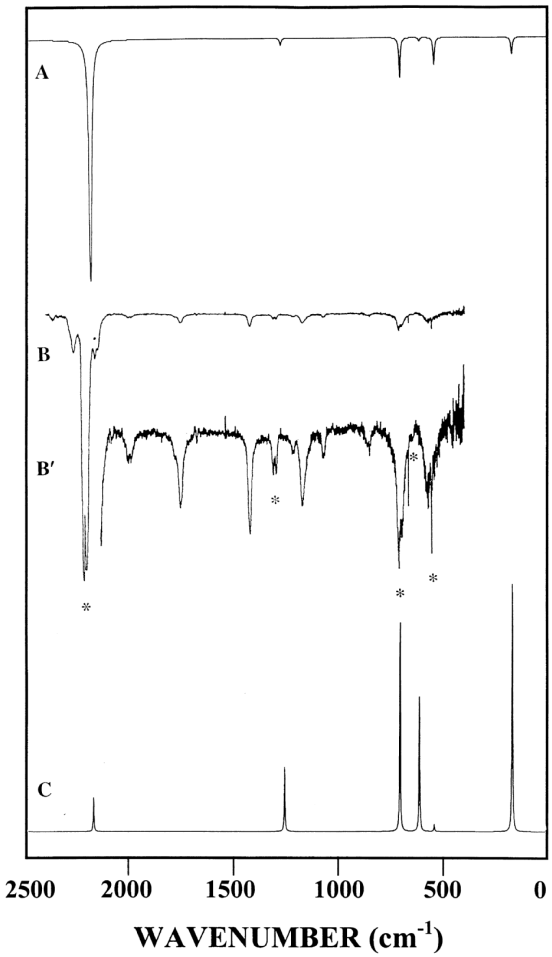

Fig. 3 Vibrational spectra of ClNCO: (A) simulated infrared spectrum from MP2/6-31G(d) calculation; (B) experimental infrared spectrum of the gas (Ref. [30]); (B ') an expansion of the weaker bands by five times; * indicating the observed fundamentals; (C) simulated Raman spectrum from MP2/6-31G(d) calculation.

The predicted intensities of the infrared bands agrees very well with the experimentally observed values (Fig. 3) where the ν_4 mode is predicted to be quite weak and ν_1 very, very strong. The ν_6 fundamental is predicted to be quite weak in the Raman spectrum but there is no experimental data for comparison. These predicted intensities for the infrared and Raman spectra do not differ significantly among the three

different calculations (Table 1).

There have been two microwave studies of ClNCO where in the first investigation [31] only three isotopic species (^{35}Cl, ^{37}Cl, ^{18}O) were studied so only a partial substitution structure was obtained which necessitated the use of one of the principal moments. This resulted in a rather large variation in the bond lengths and angles depending on the moment used to obtain the distance so the accuracy of the determined parameters was quite low (Table 4). However in the second microwave study [32], three more isotopic species were investigated which included ^{15}N with ^{35}Cl and ^{37}Cl and ^{13}C with ^{35}Cl so sufficient spectral data were obtained with all of the atoms substituted. A complete substitution structure was obtained and the determined parameters are listed in Table 4. The listed uncertainties are relatively small so these results were used to evaluate the quality of the adjusted r_0 parameters obtained from the *ab initio* predicted parameters adjusted to fit the microwave rotational constants. These data show the use of the *ab initio* predicted values coupled with the microwave rotational constants provide excellent values for the structural parameters.

TABLE 4. Structural parameters,[a] rotational constants, dipole moments and energies for ClNCO

Parameter	RHF/6-311+G(d)	MP2/6-31G(d)	MP2/6-311+G(d)	B3LYP/6-311+G(d)	MW[b] (r_s)	Adjusted r_0
r(Cl–N)	1.697	1.709	1.708	1.730	1.705(5)	1.706(5)
r(N=C)	1.212	1.241	1.236	1.227	1.226(5)	1.225(5)
r(C=O)	1.132	1.181	1.170	1.162	1.162(5)	1.162(5)
∠ClNC	119.5	121.9	121.1	120.8	118.8(3)	118.9(5)
∠NCO	174.4	169.6	170.3	171.4	170.9(3)	171.0(5)
A	50448	57763	55781	53570	51576	51571
B	3219	2978	3027	3035	3131	3127
C	3026	2832	2871	2872	2945	2948
$\|\mu_a\|$	0.371	0.807	0.799	0.603		
$\|\mu_b\|$	0.779	0.845	0.775	0.631		
$\|\mu_c\|$	0.0	0.0	0.0	0.0		
$\|\mu_t\|$	0.863	1.168	1.113	0.873		
-(E+626)	0.6663709	1.211139	1.408280	2.299173		

[a] Bond distances in Å, bond angles in degrees, rotational constants in MHz, dipole moments in Debye and energies in Hartree.
[b] Ref. [32].

3.4 Bromine Isocyanate (BrNCO)

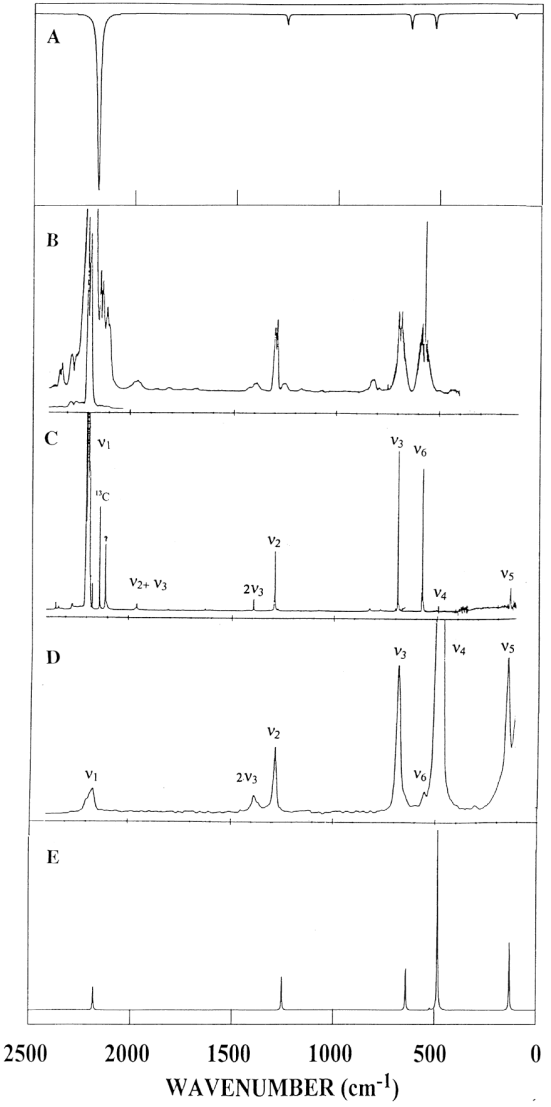

Fig. 4 Vibrational spectra of BrNCO: (A) simulated infrared spectra from MP2/6-31G(d) calculation; experimental (Ref. [35]) (B) infrared spectrum of the gas (resolution: 1 cm^{-1}), (C) infrared spectrum in neon matrix (resolution: 0.5 cm^{-1}), (D) Raman spectrum of the liquid (resolution: 4 cm^{-1}); and (E) simulated Raman spectra from MP2/6-31G(d) calculation.

The infrared spectrum for BrNCO was initially reported [33, 34] with only about one-half of the observed bands assigned. A more extensive study of the infrared spectrum of the gas was reported [30] with frequencies given for four of the fundamentals and six other bands assigned with four of them as combination bands and two as difference modes. This study was followed by an in-depth vibrational investigation [35] which included Raman spectrum of the liquid, infrared spectrum of the gas and matrix-isolated (Ne and Ar) of the normal species and Ar matrices for ^{15}N, ^{13}C, and ^{18}O enriched species. Some of these spectral data are shown in Fig. 4 along with the *ab initio* predicted infrared and Raman spectra. Remarkably good agreement is found between the observed and predicted spectra of both the infrared and Raman data. From these data the final two fundamentals were confidently assigned (Table 1). There were some very large differences between the frequencies in the neon matrix and those from the liquid, i.e. 137 g (150 l); 506 g (490 l); 572 g (560 l); 2196 g (2168 l). These differences indicate significant association in the liquid phase.

TABLE 5. Structural parameters,[a] rotational constants, dipole moments and energies for BrNCO.

Parameter	RHF/6-311+G(d)	MP2/6-31G(d)	MP2/6-311+G(d)	B3LYP/6-311+G(d)	MW[b] (r_s)	Adjusted r_0
r(Cl–N)	1.697	1.709	1.708	1.730	1.705(5)	1.706(5)
r(N=C)	1.212	1.241	1.236	1.227	1.226(5)	1.225(5)
r(C=O)	1.132	1.181	1.170	1.162	1.162(5)	1.162(5)
∠ClNC	119.5	121.9	121.1	120.8	118.8(3)	118.9(5)
∠NCO	174.4	169.6	170.3	171.4	170.9(3)	171.0(5)
A	50448	57763	55781	53570	51576	51571
B	3219	2978	3027	3035	3131	3127
C	3026	2832	2871	2872	2945	2948
$\|\mu_a\|$	0.371	0.807	0.799	0.603		
$\|\mu_b\|$	0.779	0.845	0.775	0.631		
$\|\mu_c\|$	0.0	0.0	0.0	0.0		
$\|\mu_t\|$	0.863	1.168	1.113	0.873		
-(E+626)	0.6663709	1.211139	1.408280	2.299173		

[a] Bond distances in Å, bond angles in degrees, rotational constants in MHz, dipole moments in Debye and energies in Hartree.
[b] Ref. [37].
[c] Initial microwave studies [36] show that the parameters has been deduced from limited isotopic data, only rBr-N, ∠BrNC and ∠NCO were varied.

There have been two microwave studies of BrNCO where in the first one only two isotopomers were investigated (^{79}Br and ^{81}Br) and three parameters were varied r(Br-N), ∠BNC and ∠NCO with the other parameters assumed to be the same as the corresponding parameters of the ClNCO molecules [36]. In the later microwave study [37] the ^{18}O isotopomers (^{79}Br and ^{81}Br) were investigated and with the rotational constants of the four isotopomers both r_0 and r_z structural parameters were determined (Table 5). Both of these results gave a rather short NC distance compared to the value obtained in this study by combining the *ab initio* predicted parameters with the "fit" of the microwave rotational constants (Table 5). The *ab initio* predicted parameters for the NCO moiety are nearly the same for the chlorine and bromine cyanate which is a strong indication that the relatively large difference suggested from the microwave data alone are probably in error.

Discussion

It is clear that the NCO moiety is bent in the ground vibrational state from both the microwave data and the *ab initio* predicted parameters.

Calculation level	HNCO Ground State (Hartree)	NCO linearity (cm^{-1})	molecular linearity (cm^{-1})	FNCO Ground State (Hartree)	NCO linearity (cm^{-1})
RHF/6-311+G(d,p)[c]	-167.814554	222	1332	-266.577300	220
MP2/6-31G(d)	-168.232430	385	1643	-267.144186	450
MP2/6-311+G(d,p)[c]	-168.368556	396	1725	-267.350977	446
MP2/6-311+G(2d,2p)[c]	-168.41116	373	1969	-267.416678	417
B3LYP/6-311+G(d,p)[c]	-168.738737	302	1422	-267.898154	421

TABLE 6. Calculated barriers to NCO moiety linearity[a] and barriers to molecular linearity[b] of XNCO (X = H, F, Cl and Br) molecules.

[a] NCO moiety linearity is defined with NCO group assuming $C_{\infty v}$ point group, and with XNCO molecules assuming C_s point group.
[b] Molecular linearity is defined with XNCO molecules assuming $C_{\infty v}$ point group.
[c] The second designation in parentheses, *p*-orbital polarization functions, only apply to the hydrogen atom in HNCO.

The linearity of the NCO moiety for all of the XNCO (X = H, F, Cl, Br) molecules was calculated (Table 6) and the values are very similar for all four molecules. The predicted values for the HNCO molecule range from a low 222 cm^{-1} (RHF/6-311+G(d,p)) value to the high value of 396 cm^{-1} (MP2(full)/6-311+G(d,p)) with an average value of 335 cm^{-1} from the five different calculations. A similar average value is found for the BrNCO molecule with the other two molecules having values of 390 cm^{-1}. These values on average are ~130 cm^{-1} larger than the barriers to linearity of the NCS moiety for the similar molecules [3]. The barriers to molecular linearity of the XNCS (X = H, F, Cl, Br) molecules are somewhat smaller (~1000 cm^{-1} average) than the corresponding ones for the XNCO (X = H, F, Cl, Br) molecules. Also it should be noted that the barrier to molecular linearity of FNCO is about five times larger than the value for HNCO and about three times larger than those for the other two halides (Table 6). The larger barriers to molecular linearity for the XNCO molecules are undoubtably due to the significantly small ∠XNC angle of the cyanates compare to the similar angle of the isothiocyanantes.

molecular linearity (cm^{-1})	ClNCO Ground State (Hartree)	NCO linearity (cm^{-1})	molecular linearity (cm^{-1})	BrNCO Ground State (Hartree)	NCO linearity (cm^{-1})	molecular linearity (cm^{-1})
8292	-626.672232	204	2769	-2739.547696	174	2361
8553	-627.211139	502	3033	-2737.630255	431	3205
8373	-627.408280	456	3128	-2740.614637	388	3106
8083	-627.481774	421	2758	-2740.672012	376	2355
7890	-628.299173	366	2933	-2742.233645	313	2763

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(Department of English)

The Act of Creation: Speech Acts and Contextual Relevance

1.1 Method and Analysis: Classification

In one of the most intense moments of Arthur Miller's Death of a Salesman, a broken down salesman, Willy Loman, is at his wit's end trying to convince his son of an impossible falsehood. Their lives stand to be altered forever as Willy *commands,* "Now stop crying and do as I say. I gave you an order. Biff, I gave you an order! Is that what you do when I give you an order? How dare you cry!" (A. Miller 120) The playwright's stage directions even insist that Willy Loman is "*assuming command*"; it seems to be a directive, an order, with layers of meaning and emotion, but can it really be? To truly be a command it must necessarily be a "speech act," a thing "done with words"; However, J. L. Austin, the innovator who first defined the theory of speech acts in the seminal work on the subject, How to Do Things with Words, set up a conundrum: "a performative utterance will [...] be *in a peculiar way* hollow or void if said by an actor on the stage, or if introduced in a poem, or spoken in a soliloquy" (Austin 22; emphasis original). The questions must be cleared up as to whether or not a character in literature can indeed indulge in speech acts and, if so, what role those speech acts play in literature. I argue that the importance of speech acts performed by literary characters is that they are not only real and possible, but necessary and supremely relevant within the bounds of their context.

To analyze literary speech acts, I use a system innovated by Austin himself which was later refined by Searle, a philosopher and a noted pioneer in linguistics. Austin provided a tentative list of general classes of speech acts. He believed that his list was not exhaustive and that some speech acts may fit in multiple classes. His main interest was that his class system be useful (Austin 149-50). The general classes that Austin identified were *verdictives, exercitives, commissives, behabitives,* and *expositives*. Austin defined these classes by listing a few examples and devoting a paragraph to the way his examples were related to the labels (Austin 150-162). As Austin had expected, others have gone on to create more inclusive, better defined classes for use with speech act theory.

In revising the classifications, Searle disagreed with Austin on

several points. Where Austin saw an infinite range of possibilities for speech acts, Searle supposed that "No one [...] would say that there are countless kinds of economic systems or marital arrangements or sorts of political parties; why should language be more taxonomically recalcitrant than any other aspect of human social life?" (Searle vii) Instead, he believed that there must be a finite body of possible ways to use language, and that body could be divided thoroughly into the parts it comprises: "There are not [...] an infinite or indefinite number of language games or uses of language. Rather, the illusion of limitless uses of language is engendered by an enormous unclarity about what constitutes the criteria for delimiting one language game or use of language from another" (Searle 29). This assessment led him to an efficient summary of the "things we do" with language; namely, we "tell people how things are (Assertives), we try to get them to do things (Directives), we commit ourselves to doing things (Commissives), we express our feelings and attitudes (Expressives), and we bring about changes in the world through our utterances (Declarations)" (Searle viii). Since I have not been able to find a speech act that Searle's list does not accommodate, I will use his labels when I find it necessary to characterize a speech act to point out what is being done with words.

1.2 Method and Analysis: Constative-Performative Implied Acts

Austin starts his lectures off with a curious hedge, saying, "What I shall have to say here is neither difficult nor contentious; the only merit I should like to claim for it is that of being true, at least in parts" (Austin 1). That final phrase in particular, "at least in parts," inspires inquiry; it implies that what he has to say may be *false* in parts. He could have meant to say something else entirely. Maybe it is only a hedging modesty, but it could imply something greatly more important: that some of what he says can be classified neither as true or false, but instead as felicitous or infelicitous, which, as I will discuss in detail later, is the most eminent defining characteristic of a speech act.

J.H. Miller, an active modern linguistics scholar, examined Austin's opening as well and concluded, "Austin claims that he has at least in parts spoken the truth about the distinction between performatives and constatives. He invites the reader to measure the worth of the book by its truth value and perhaps dares the reader to tell the true from the false" (J. H. Miller 22). But if Austin is really only inviting the reader to tell the true from the felicitous, and not the false at all, then he may be pointing out that he sees that there is a mix of performative and constative in his work, especially given all of the *examples* of performatives in it. Furthermore, the book performs something as a whole; it reveals, calls attention, names things, etc. Austin suggested that:

at least in some ways there is danger of our initial and tentative distinc-

tion between constative and performative breaking down.

We may, however, fortify ourselves in the conviction that the distinction is a final one by reverting to the old idea that the constative utterance is true or false and the performative is happy or unhappy. (54)

Nonetheless, important caveats of the issue remain unexplored in How to Do Things with Words. Phrases exist that seem only to describe a situation, at the logical form, but which indeed have a force of action in a performative sense. Such phrases can be found in Death of a Salesman:
(1) CHARLEY: It was my ace (A. Miller 46)
When Charley says sentence (1) at a contentious moment during a card game with Willy, he is logically only describing the situation as he understands it. He adds, for emphasis, "for God's sake!" which does nothing to alter the logical meaning. But there is a speech act embedded in (1). It is an assertive-directive challenge; Charley wants Willy to admit his transgression of the rules of the game. Example (1) has both constative and the performative faces. A constative is either true or false, and a performative is either successful or unsuccessful. Example (1) fits both descriptions since either the ace was Charley's or it was not, true or false, but Charley is definitely trying to solicit a reaction from Willy. By stating how things are (an assertive) he is telling Willy to relent (a directive). And that attempt shall either be successful or unsuccessful. As it turns out, Willy does not relent; however, even though Charley is unsuccessful in his attempt, the fact that (1) can be measured in terms of success shows that it is, at least in part, performative, much as Austin's book is, at least in part, true.

Perhaps the issue regarding literary speech act analysis arose because literature is not fully understood in many ways and therefore ineligible, in some eyes, for scientific study. As Sandy Petrey, a pioneer in literary speech acts analysis, concluded, "theory and theorist disagree over what literature is and does. The imperative to socialize that erases the dividing line between constative and performative also erases that between literary and performative" (Petrey 50-51). In Speech Acts and Literary Theory, Petrey broadens the discussion of the constative performative glide, saying, "the constative/performative distinction dies because both its terms encompass language and society at once. Identifying the constative as a performative proclaims language's social identity perhaps more spectacularly than discovering the performative in the first place" (42). To Petrey, the distinction dies because societal pressure destroys it; social interactions cannot be purely constative, true or false.
The purity of a true or false statement can't survive the social pressure to derive action. She argues that the speech acts analyst must broaden her perspective to include apparently constative utterances since "form alone

cannot establish linguistic force. Society must come in when force is at issue, and with literature it certainly is" (Petrey 51). (1) above is just one of a multitude of possible examples of the constative sheep's clothing that a performative can don. An example of a more successful performative is:

(2) BIFF: He wouldn't listen to you (A. Miller 120).

This statement is both assertive and expressive, and assertives always have the overlay of a constative because they "tell people how things are" (Searle viii). It asserts that the math teacher would not listen to Willy, and in Biff's eyes that is true—how the world has become. However, it furthermore expresses Biff's profound disappointment with Willy. What it *does* is to reveal the forever-changed view Biff holds of Willy. While it doesn't seem like such a pivotal action on the surface, it is actually the first time in Biff's life that he has lost faith in his dad. And that change, that realization and disappointment, characterizes Biff's relationship with Willy until the day Willy dies.

Earlier in his life, Willy was the source of Biff's confidence:

WILLY: You nervous, Biff, about the game?
BIFF: Not if you're gonna be there. (A. Miller 31)

Biff drew confidence from Willy's presence before. He "missed" Willy "every minute" that he was gone (A. Miller 30). And Willy's philosophy rolled from Biff's tongue in respectful imitation:

WILLY: Charley is not—liked. He's liked, but he's not—well liked. (A. Miller 30).
WILLY: Bernard is not well liked, is he?
BIFF: He's liked, but he's not well liked. (A. Miller 33)

From the time Biff states (2) until the day Willy dies, the change in Biff first represented in (2) sets him on a restless course to wander without happiness, confidence, or a sense of meaning in his life, constantly trying to redefine himself on his own terms, or trying to, as his mother Linda puts it, "find himself," (A. Miller 16). (2) redefines both father and son. Finally, I will put the constative/performative distinction to rest because the study of utterances that are constative on the surface can be studied for their performative capacity *productively*. Valuable surmises can be drawn from the analysis of mixed constative-performatives, just as valuable and informative results can be derived, for example, through Newtonian physics, though it has been supplanted by Einsteinian physics. And when Einsteinian physics give way to something that describes the universe more thoroughly, Einstein's model will likely still be used to demonstrate points that the new theory convolutes. The theory that constative and performative are mixed is *productive*, and that is merit enough by itself. Not only do I see the distinction to be quite blurry, but

there is also much to be gained by analysis of constative-performative utterances.

1.2 Method and Analysis: Context

As an author Arthur Miller wields an incredible power through his words. He is a creator of worlds. Miller does something very real, in the Lomans' world, without even a word uttered on stage. The German philosopher Max Picard once wrote "Speech came out of silence, out of the fullness of silence. The fullness of silence would have exploded if it had not been able to flow out into speech. . . . There is something silent in every word, as an abiding token of the origin of speech. And in every silence there is something of the spoken word, as an abiding token of the power of silence to create speech" (Picard qtd. in Clair 3). In creating the world of Death of a Salesman, Arthur Miller was demonstrating the latent power in the "fullness of silence"; the play opens with a long set of stage directions. Without them, there is no setting, no person of Willy Loman, no space for the actions to take place in. Miller writes, "*A melody is heard, played upon a flute. It is small and fine, telling of grass and trees and the horizon*" (A. Miller 11). With that, the silence breaks into music. For nearly two full pages nothing will be *said* at all. "*Before us is the Salesman's house. We are aware of towering, angular shapes behind it, surrounding it on all sides,"* Miller's stage directions continue, "*Only the blue light of the sky falls upon the house and forestage; the surrounding area shows an angry orange"* (A. Miller 11). On and on, things appear. Miller is doing something with words: creating a world, peopling it, giving context to his story. In that way, silence begets speech. Miller is creating *context*.

In the real world, context for discourse requires no one's special act of creation. In fact it is, as Searle notes, impossible to remove all context:

I argue against the theory that the literal meaning of a sentence can be construed as the meaning that it has apart from any context whatever, the meaning that it has in the so called 'null context'. Against this view I contend that the notion of literal meaning only has application against a background of assumptions and practices which are not themselves represented as part of literal meaning. (Searle xi)

He notes that context is made of assumptions and practices. The speaker, hearer, and audience unconsciously hold many of those assumptions as part of their individual representations of the world. Context comes to bear pragmatically, reaching outside of the restraints of the discourse itself and its language. As noted linguist Diane Blakemore explains, "the fundamental ability in communication is not linguistic encoding and decoding, but the ability to derive inferences which result in assumptions

which are entertained as metarepresentations of other people's thoughts, desires and intentions" (Blakemore 71). In Death of a Salesman, Arthur Miller does not attempt only to create a dialogue that explains his characters, their motivations, and their relationships; he creates an entire situational context. The audience is intended to extrapolate the meaning not only through the dialogue, but also through the circumstances that have led to the activities the characters indulge in. All of these smaller acts add up to a main theme. The play is, overall, a tragedy that investigates the depression and suicide of a common man. All of the instances that I undertake to examine in this essay are related to that main theme in some way and form an interactive context with it.

Every great literary work is a mystery, whether the mystery is who committed a crime or, less blatantly, what makes the characters tick. The circumstances of the mystery in Death of a Salesman come together to create a pivotal moment that takes place in Boston. There are references to Willy Loman's trips to Boston throughout the play, and the tension between Biff and Willy has its roots there. Biff's admiration of his father is well established in his youth. He imitates Willy and takes on his philosophies, as shown above with "well liked" (30-3). Biff lives to make his father proud and thrives on his attention, which is shown in his need for Willy's support at the upcoming football game (31). But all of that changes when Biff, having failed his math class, races to Boston to solicit his father's help in asking the teacher to change the grade (116-121). Arthur Miller demonstrates this scene to the audience as Willy's dream-like memory. Willy remembers being with a woman in his hotel room when Biff arrived. As the action unfolds, Biff finds that she has been hiding in the bathroom, and he is crushed. That context is the impetus for the strain in their father-son relationship and drives all of the actions, including speech acts, that transpire between them from then forward.

The analyst (and perhaps the audience) must understand the way the utterances relate the actions in the play to the theme that comprises them. But the characters must "comprehend"[1*] in a different way; they must relate the dialogue to their "lives"* and personal "experiences."* The characters need not "feel"* that a theme is being pursued, in a literary sense; they need only understand the relevance of each passing utterance and action to their current situation. Blakemore explained this idea, saying, "the inferential process involved in utterance interpretation may involve assumptions about temporal or causal relationships between events in the world or about relationships between the speaker and hearer. However, within a relevance theoretic framework, these assumptions are not construed as assumptions about relationships in the discourse or the

1 * I bracket *comprehend, lives, experience(s),* etc. with quotes since characters don't technically *have* lives, experiences or comprehensions but only *represent* them through the lens of authorship.

text itself" (157). Assumptions that come to bear on the discourse may reach far beyond the actual discourse itself into the characters' "experience." These assumptions are brought to attention, in general, by the process of "*Ostensive-inferential communication:* the communicator produces a stimulus which makes it mutually manifest to communicator and audience that the communicator intends, by means of this stimulus, to make manifest or more manifest to the audience a set of assumptions {*I*}" (Sperber & Wilson 63). *Audience* here means the character receiving the communication, not the audience of a play, since this theory generally applies to natural language, not literature. However, a playwright must use stage directions to incorporate this type of communication into a situation in a script since the stimulus is often an action rather than dialogue. Not only must the characters "understand" ostensive communication, but the audience must also be able to understand it for their own comprehension and be able to understand the relevance of the ostensive communication to the characters' comprehension. In Dreath of a Salesman, Biff accomplishes this kind of communication when he cries (120). The fact that he cries has all of the hallmarks of a speech act, except for the first, a locution. It has a perlocution, an effect on Willy, who reacts, "How dare you cry!" and then softens, puts his arm around Biff, and attempts to tell him that his infidelity is not as important as it seems (120). It has illocution in that Biff intends his father to know his feelings, but the locutionary act is neither truly a locution, only an action, nor voluntary. Context in this form not only lends meaning to the speech acts surrounding it, but borders on becoming a speech act or something like it in itself.

A playwright can use ostensive communication to manipulate the audience's cognitive environment as well. The writer can either show the audience what she believes to be relevant for the audience's understanding, or she can withhold information from the audience to alter the audience's cognitive environment by controlling what ideas are manifest to her audience: "What is manifest in Sperber and Wilson's terms, is what to an individual is situationally recognizable, comprising the actual and potential impingements of the physical environment on their cognitive environment (the latter will include knowledge and memory)" (Toolan 184). Miller plays with character knowledge and memory by hiding the incident in Boston and all that it manifests until page 116, though the incident happened several years before the time frame of the play and Willy's daydream which reveals it. In it, the presence of The Woman, the new stockings, and Biff's tears, among other things, will add to the audience's cognitive environment, which is precisely what Miller exploits, by hiding it until late in the play, to create the mystery. Had Miller told the story in a more linear fashion, showing Biff's younger days in the earli-

est scenes, followed hard upon by the incident in Boston, the mystery would have been far less significant; the audience would only be waiting to see how the characters reacted to it rather than involved in trying to understand the relationship between Biff and Willy and wondering how it could have gotten to its dilapidated state.

In order to alter the audience's cognitive environment, the author must have what Schultz calls the "capacity for entertaining a multiplicity of views of the world (and of ourselves), without thereby suffering irreparable mental breakdown," which is "at the root of the versatility, flexibility, adaptability that makes us human beings, rather than automata" (Schultz 117). The ability to comprehend in this way is not unique to authors, but it is a tool that authors must use in a different way than ordinary language users. Whereas humans must ordinarily be able to understand the way that others perceive their world to understand another person's perspective, authors must create the world and invent the different perspectives that the characters experience. An author uses this understanding of multiple perspectives in order to create conflict. Toolan argues that cognitive effect theory can be useful without assuming a *shared* cognitive environment (184). Characters may have independent cognitive environments which only share certain things in common, not an entire shared environment. If Biff's assumptions perfectly matched Willy's, there would be no loss of respect and no real conflict. This is the situation Willy is hoping for when he tells Biff "Now look, Biff, when you grow up you'll understand about these things. You mustn't—you mustn't overemphasize a thing like this" (A. Miller 120). It is the violation of Biff's expectations, embodied in his assumptions about Willy prior to the Boston incident (his belief in Willy as a father and a husband to his mother) that drives the intrigue.

In the scene mentioned above, much of the interpretation relies on the context surrounding (2), "He wouldn't listen to you" (A. Miller 120), which all by itself, says nothing of the serious inferences that I have drawn from it. Context gives meaning to speech acts—especially indirect speech acts. Searle asserts that indirection can be used to perform a speech act unrelated to the direct meaning of a phrase (Searle 33); instead of directly rejecting an invitation to dinner, a person can reply that she has to wash her hair. Though the statement is in no way directly related to the invitation, the hearer will almost infallibly understand the implication. Drawing heavily on Grice, Blakemore shows that non-truth conditional meaning can be derived from implicature (13). Furthermore, she makes a case for "a theory of pragmatic competence whose domain includes the role of context and general pragmatic principles in the interpretation of utterances and for a theory of linguistic pragmatic competence whose domain includes the role that certain [...] expressions play in

the interpretation of the utterances that contain them" (Blakemore 14). Her theory relates context to linguistic meaning, which is just why the playwright must create the circumstances surrounding Biff's emotional departure to demonstrate the impetus for his emotional disjunction from Willy.

In that scene discussed, Biff is not reacting to something said, but to something that he learns about his father by seeing and experiencing it. He learns, by The Woman's presence in Willy's hotel room, that his father is a "liar" and a "fake" (A. Miller 121). This realization results from ostensive, not linguistic, input:

Willy laughs and The Woman joins in offstage.
WILLY, *without hesitation*: Hurry downstairs and—
BIFF: Somebody in there?
WILLY: No, that was next door.
The Woman laughs offstage. (A. Miller 118)

Biff's suspicions arise from hearing The Woman's laughter and from what he senses in Willy's reaction to the laughter. But he has not yet assimilated the information:

BIFF: Somebody got into your bathroom!
WILLY: No, it's the next room, there's a party—
THE WOMAN, *enters, laughing* [...]: Can I come in? There's something in the bathtub, Willy, and it's moving!
Willy looks at Biff, who is staring open-mouthed and horrified at The Woman.(A. Miller 119)

In this scene, none of the spoken words reveal anything to Biff to make him "*horrified.*" His life has been changed by what he sees, the context that leads to Willy's resulting speech acts, a series of lies.

Willy's first lie is already out, "No, it's in the next room, there's a party," an assertive speech act meant to change Biff's cognitive environment. Willy is attempting to change the way Biff uses the information he is gaining. He follows that lie with "Ah—you better go back to your room. They must be finished painting by now. They're painting her room so I let her take a shower here. Go back, go back..." (119) Of this string of utterances, only one is an outright assertive lie: "They're painting her room so I let her take a shower here." There are examples of directives as well, in "you better go back to your room," and "Go back, go back." The Woman cannot go back to her room; she probably has no other place in the hotel to go. Tragically, for Willy, she either does not pick up on his desire for her to take part in his lies, or she does not care to help him to lie. She refuses the role that Willy thrusts upon her. He forms that role for her not with a specific speech act but with the collection of performatives

and constatives he uses. The rest of Willy's utterances are more heavily constative in form, though they are false. These constative-performatives falsely describe the world as Willy wants Biff to see it. Willy's performatives attempt to make others conform to the roles he has chosen for them in the false world he is describing.

Performatives by themselves are only part of the story. In the scene above, Willy has used constative-formed utterances to attempt to form a false context and to form an overall implied speech act: to assert a lie to Biff which would alter Biff's view of the world in a way that would save Willy from the repercussions of his infidelity. Willy's attempt to create a new contextual environment for his speech acts shows that context is indeed integral to speech acts, as Searle suggests, and that literary works incorporate and rely on this fact to portray a model of reality. The context is a part of the performative, not just a part of its description.

1.3 Method and Analysis: Felicity

More importantly than *providing* context for the play's themes, the character's dialogue and speech acts *rely* on context for relevance. Each character holds assumptions that make up his or her personal context, or personal view of the world, and Sperber and Wilson assert that "An assumption is relevant if and only if it has some contextual effect in that context" (122). They later relate their theory directly to speech acts, saying, "There are [...] a variety of ways in which a description [...] can be relevant; some will have the effect of an ordinary assertion, others the effect of a report of speech or thought, others the effect of an irony or dissociation, others the effect of a speech-act classification and so on" (Sperber & Wilson 249). They list three ways that an assumption can have no contextual effects at all, including, "the assumption is inconsistent with the context and is too weak to upset it" (121). Willy's lies do not work on Biff. They are infelicitous because the new assumptions presented by Willy are inconsistent with the assumptions that Biff already holds and are too weak to upset the existing context.

Furthermore, Biff sees Willy's intention more lucidly than the false context Willy attempts to create. Blakemore's explanation of relevance seeking may explain this kind of phenomenon: "A hearer [...] adopts a strategy which does not involve meta-representing the speakers thoughts:" in other words it does not involve creating a personal mental representation of what the listener believes the speaker's thoughts to be; "[S]he simply looks for an interpretation that is relevant enough, and on finding it assumes that it is the intended one" (Blakemore 70). Although Blakemore is attempting to describe how successful communication works, her theory applies because it describes the same process that allows Biff to see through Willy's lies. Biff can see that his father's assertions are

relevant in that their intended effect is to obscure his contextual understanding, not to elucidate it. Willy's speech acts, his lies, throughout his interaction with Biff in this scene are infelicitous because he cannot make the false context more relevant than the real one. Biff's assumptions are too strong.

Willy is a seducer of sorts as well. He even gives his son this philosophy on relationships: "Just wanna be careful with those girls, Biff, that's all. Don't make any promises. No promises of any kind. Because a girl, y'know, they always believe what you tell 'em" (A. Miller 27). He has duped a mistress in Boston, and he entices his wife and children by telling them what he believes they want to hear, always attempting to modify the context to suit his own ends. In this way, his speech compares with Felman's analysis of Molière's Don Juan's speech:

Saying, for him, is in no case tantamount to knowing, but rather to *doing: acting* on the interlocutor, modifying the situation and the interplay of forces within it. Language, for Don Juan, is performative and not informative; it is a field of enjoyment, not of knowledge. As such, it cannot be qualified as true or false, but rather quite specifically as *felicitous* or *infelicitous,* successful or unsuccessful. (Felman 27)

Where Don Juan enjoys success, Willy Loman fails. Willy's speech acts are constantly failing due to their reliance on the false context he attempts to build for them.

Throughout the play Willy attempts to sell himself with lies. Starting with Willy's earliest dreamlike memory in the play, he attempts to inspire confidence in himself and his boys, saying, "Tell you a secret, boys. Don't breathe it to a soul. Someday I'll have my own business, and I'll never have to leave home any more" (30). If those were Willy's plans, then the play never shows him trying to follow them. He goes on to exaggerate his successes, "America is full of beautiful towns and fine, upstanding people. And they know me, boys, they know me up and down New England. The finest people. [. . . .] I have friends. I can park my car in any street in New England, and the cops protect it like their own" (31). He also tells his wife that he's doing very well in business, saying, "I did five hundred gross in Providence and seven hundred gross in Boston" (35). Over the next few pages of dialogue Willy's confidence breaks down and the truth emerges when, in her excitement at the professed success, Linda produces a pencil and begins to figure their profit. Willy then says, more realistically, "Well, I—I did about a hundred eighty gross in Providence. Well, no—it came to—roughly two hundred gross on the whole trip" (35). Reality comes crashing in on him, and he begins to contradict the lies that he told to the boys as well, saying, "You know, the trouble is, Linda, people don't seem to take to me," and, "I know it when I walk in. They seem to laugh

at me. [. . . .] I don't know the reason for it, but they just pass me by. I'm not noticed" (36). Willy's lies, his assertive speech acts, break down into admissions, his expressive speech acts. He flies back and forth between self-confidence and defeated depression, the defeat resulting from his infelicitous lies. Felicity depends upon "the total speech-act in the total speech-situation" (Austin 148). Willy Loman attempts to create, with his words, a certain speech situation, a relevant context including a successful version of himself. But he cannot make it real. When reality intrudes incongruously with his locutionary inventions, Willy is defeated. His lies become infelicitous. He ultimately fails because the context he attempts to build gives way to the real context.

2.1 Conclusions

Context comes from both the text and the reader. A reader's context is her entire life experience up to and including the moment of any given utterance, but a text's context is only what is presented in the text, along with a finite number of specific references within the text to the real world. Those references are only parasitic on the real world, though, and are restricted in relevance in that the characters to whom they apply are themselves limited to their representation in the text. Literary context is restricted, then, in the sense that its referents are mainly accessible within the text itself and that the text is finite. Instances of any real-world referents are also finite, in number at least, since a given literary work represents only what is said within its own confines; it represents only the real-world referents that are included in or alluded to in that text, whereas natural language has no restriction on referents, its context being the real world and the entire experience of all participants. Also, natural language is created in real time, making the context open-ended since possible referents during discourse creation are limitless. The advantages of this can be seen in that, in natural language analysis, it is customary to record in some way the utterances to be analyzed thereby rendering them more similar to literature so that they can be thoroughly studied. In literary analysis, the context can be studied to the most thorough degree possible. Only the context of the audience's experience and personal reaction to speech acts is beyond the scope of analysis.

What speech acts accomplish in the characters' world, evaluated through their context, elucidates the perlocutionary effect that the speech acts have, including emotional responses not only for characters, but for the audience as well. These are derived through context first because context is a part of the performative, not just a part of its description. Austin said, when speech act theory began, that felicity depended upon "the total speech-act in the total speech-situation" (Austin 148); however, I have shown that "the total speech-situation" requires a great deal more than the simple felicity conditions this is often taken to describe. "The

total speech-situation" is not simply a set of roles to be played under the appropriate circumstances. It is every relevant action and every relevant thing that is seen, heard, or otherwise sensed by the participants in a dialogue. "The total speech-situation" is the history and attitudes of every participant as well. Context is not just part of the description of a speech act; it is much of the driving force behind a speech act.

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Case Study: Corruption in Iraq

The growing problem of corruption in Iraq is intimately connected to the impotence of the current government and the enduring ethnic conflict the state experiences today. This paper views this issue through a historical comparison informed by European history and relevant political theories. Building on a theoretical framework composed of history, political science and cultural criticism, this paper will compare the experiences of present day Iraq to those of the former Yugoslavia. I argue that the story of Yugoslavia is helpful to understand the internal conflicts of Iraq and further, that the comparative model I will employ brings into question the fundamental capabilities of the modern nation-state.

At the very root of this conflict is the structure of the modern nation-state. As historian Andrew Bergerson explains, the power of the nation-state is expressed as a monopoly on violence and taxation, the goal of which is to create and preserve centralized power.[1] The ideal, European nation-state, perhaps like France, would also reflect a homogeneous population in accordance with its single authority. This homogeneity is imaginary, however, and the language and practices of the dominant culture, often embraced as "national" culture, become part and parcel of the governing itself. Subordinate cultures are forced to abide by dominating mores, and their practices are frequently devalued and discriminated against. Moreover, as Kristin Ross notes, "When modernization has run its course, national subjectivity takes the place of class," and, in effect, ethnicity comes to replace class as the basis of national culture.[2] The modern nation-state in some ways depends on this tension in order to function (disenfranchised groups are useful for cheap labor and a growing economy, for example), but when ethnic differences become the basis for political affiliation in a multi-ethnic state (particularly as a result of political upheaval), a process of decay begins which threatens the life of the superstructure.

Demography is one factor in this process. Ethnic unmixing--the geographical separation of ethnic groups--is a common response to governmental disorder. Of his research on migration following the collapse

1 Bergerson, Andrew. Public Lecture, University of Missouri-Kansas City. 12 November 2007.

2 Ross, Kirstin. *Fast Cars, Clean Bodies*. Boston: MIT Press, 1995. p. 149.

of the Habsburg, Ottoman and Hungarian empires, historian Rogers Brubaker notes that "in the protracted course of post-imperial unmixings, the phases of greatest intensity have for the most part been closely linked to actual or threatened violence, especially during or immediately after wars."[3] While the identity crisis associated with political collapse often reinforces ethnic identification and solidarity, the factors that influence ethnic migration after such political turmoil are complex. Brubaker mentions "rootedness" of the new minority, "anticipated and actual policies of the successor states toward the minority," "availability and quality of resettlement opportunities," and " 'voice' as an alternative to 'exit'," as factors in ethnic mobility. [4]

Similarly, political scientist Miles Kahler employs economist Albert Hirschman's concepts of voice, the extent to which citizens can participate in their government, and exit, the propensity of a population to leave a group, in his work on decolonization as a means to explain public reaction to political failure. He writes, "Failure for the party leaders thus acquires two meanings: in the case of exit, the unsuccessful leaders have few followers or inactive ones; in the case of voice, the leaders face rebellion or replacement."[5] While Kahler uses these terms in the context of loyalty to political parties, they are also useful to explore loyalty to the state itself. When the nation-state fails to provide mechanisms for voice over exit, the threat of succession or civil war arises. Geographic mobility, which typically only fortifies pre-existing ethnic regions, ensues and amounts to political mobility, with each new boundary erected between ethnic groups acting also as a political boundary. Such fragmentation paralyzes the state's functioning as a whole. These unmixings are common to distressed states and typically reflect ethnicity as an intensified form of political identity.

Brubaker cites Yugoslavia as a helpful example. The five major ethnic groups represented in Yugoslavia--Serbians, Croats, Montenegrins, Macedonians and Slovenes--had independent national histories and approximate territories. Josip Broz Tito, the Socialist Party's general-secretary in Yugoslavia in 1937 and president from 1953 to 1980, acknowledged Yugoslavia's different ethnic groups and their territories but also attempted to form a collective "socialist Yugoslavian consciousness."[6] This tension reached a head during the global protests of the summer of, as Yugoslavia's minority populations protested their

3 Brubaker, Rogers. "Aftermaths of Empire and the Unmixing of Peoples." *After Empire: Multi-Ethnic Societies and Nation-Building*. Eds. Karen Barkey and Mark Von Hagen. Boulder, Colorado: Westview Press, 1997. 167-68.

4 Ibid. 167.

5 Kahler, Miles. Decolonization in Britain and France. Princeton: Princeton University Press., 1984. 85.

6 Pavković, Aleksander. The Fragmentation of Yugoslavia: Nationalism and War in the Balkans. New York: St. Martin's Press, 2000. 62.

oppression under the dominant cultures of the different nations within the state along side the protests that occurred between the five dominant ethnic groups. In fact, Muslim protest even spurred a new wave of underground Serbian nationalism. While nationalist movements like that of the Serbs remained secretive because of the heavy hand of the socialist government, which eradicated threats to peaceful socialism, political resolutions in the coming years made almost certain the demise of the forced harmony of nations under Tito's rule.

A new Yugoslav constitution drafted in 1974 gave the ethnic groups more autonomy in the form of a semi-confederation. It also set up a governing body which, following the death of President-for-life Tito, rotated the presidency between the nations each year. This new model forced aspiring politicians to identify with their ethnic group as a path to political power, lending further strength to nationalist movements which, after the death of Tito in 1980, became less secretive. The result was the near eradication of non-ethnic political voice. In 1988, Slobodan Milosevic began to openly organize and promote Serbian nationalism, and in 1990 Dr. Franjo Tudjman, a genocide apologist, was elected president of Croatia. The disintegration of the USSR in 1989 dealt a moral blow to socialists worldwide, and at the same time in Yugoslavia power moved from the hands of the centralized socialist union to the diverse hands of the local population whose cultivated differences undermined their ability to cooperate. Croatians and Slovenes fought to withdraw as autonomous states while Serbians and Montenegrins pushed to retain the Yugoslav state. When Bosnia-Herzegovina decided to secede as well, the predominantly Serbian Yugoslav army advanced in an effort to reverse the proceedings.

The official combat between the territories in the early 1990s is less important for this argument than the ethnic violence that took place within each. In these divided territories, dominant ethnic groups battled to maintain majority rule as their subordinate counterparts fought to save their ethnic identity. The Serbians in what remained of Yugoslavia helped to finance, arm and feed Bosnian Serbs who fought in Bosnia against secessionist non-Serbs in an effort not only to gain political control of the territory but also to render it more Serbian ethnically. When the centralized, bureaucratic powers of the socialist government fell with the death of its leader and the collapse of other states in the region, the restructuring and consequent bids for political power by the remaining Yugoslavs, with a Serbian majority, were organized and fueled by ethnic identity. The result is a project on the part of each group to both "reaffirm the sovereignty of 'its' nation over the territory that was claimed for it" and creating within that territory an ethnically homogeneous nation.[7]

7 Pavković, Aleksander. *The Fragmentation of Yugoslavia: Nationalism and War in the Balkans*. New York: St. Martin's Press, 2000. 97.

The 'national' identity of Yugoslavia was only espoused by the Serbs, who understood it as an extension of Serbian identity and who stood to gain more political control with its preservation. The cycle of cultural violence and ethnic unmixing continued, ensuring the demise of Yugoslavia, and today each nation is a separate state.

The causes, characteristics and consequences of the breakup of Yugoslavia can in many respects be used a model for understanding ethnic conflicts in the modern nation-state. The fragmentation reflects the state's inability to maintain a monopoly on violence and taxation in a centralized government during the tumult of political transition caused by the disintegration of centralized power and organized by ethnic nationalism. While the previous oppressive and centralized ruling body suppressed ethnic nationalism, it also reinforced ethnic identity. This identification quickly becomes the vehicle for political participation in the transitional period after the change of authority. The multi-ethnic state, once it begins to make formal political organization based on ethnic identity, can hardly reverse the influence of such affiliations and their subsequent bids for cultural dominance. The ensuing ethnic unmixing and violence are inherent in the collapse of a modern multi-ethnic state and, I contend, are ultimately insurmountable to the project of modern multi-ethnic nation-building.

Consider the case of present day Iraq. The ethnic combat occurring today is the result of social structures and policies similar to this model. When the Ba'ath Party successfully seized power in 1968, its platform promoted secular modernization, military strength and Pan-Arabism.[8] During the next decade and a half, Iraqi foreign and domestic policy quadrupled oil revenues and used the money to build a strong military and also crucial infrastructure like roads and schools. Pan-Arabist sentiment was the outcome of Arab resentment of British colonization and the political power of the West and advocated the political alliance of Arab peoples. This unification, of course, did not include the ethnic Kurds living in Iraq, a mostly Muslim group whose heritage was different than Iraq's Sunnis and Shiites. When Saddam Hussein, in a Stalin-like move, usurped his mentor, Ahmad Hassan al-Bakr, in 1979, ethnic differences, though not officially legislated, came to be a driving factor in domestic politics.

Saddam Hussein, a Sunni Muslim, shortly after taking power purged the Ba'ath Party of dissidents and replaced them with loyal Sunnis. Though Sunnis constitute a majority of Muslims worldwide, they are the minority in Iraq. The CIA World Factbook estimates that Sunnis make up only 32%-37% of the population.[9] Though the Iraqi government

8 *PRI: The World.* "The History of Iraq: Part II The Rise of Saddam Hussein." Ed. Jeb Sharp. 12 February 2003. <<http://www.theworld.org/?q=node/5554>>.

9 CIA World Factbook. Accessed 7 December 2007. <<https://www.cia.gov/

was not explicitly ethnically based, Hussein filled its offices with those of his own affiliation, a move that can be traced back to his adolescence. Hussein came of age living with his politically active uncle in Tikrit, a town whose social structure was influential to the future president. Historian Phebe Marr explains, "Tikrit in those days was tribally organized. Tribal values, tribal clan life was really at the core of how, not only how you organized yourself but how you identified."[10] Having grown up feeling strong ties to local community and ethnicity, Hussein brought these inclinations with him to Baghdad.

What resulted from his presidency was increased tension between politically dominant Sunnis and disenfranchised Shiites. In addition, in the name of Pan-Arabism, the Kurdish peoples of Iraq became a target of violence. During the Iran-Iraq war in the 1980s, Hussein implemented anti-Kurdish policies and began directly attacking their region between 1988 and 1991 in a campaign called *Anfal*. Hussein ordered massive air attacks, using chemical weapons, and decimated approximately 4,500 villages, killing as many as 100,000 Kurds.[11] During this time, thousands of Kurds were deported to the southern reaches of Iraq in an attempt to dilute their 1991 uprising. At this point, the United Nations stepped in to create a Safe Zone under which the Kurds lived in relatively peaceful, functioning democracy until Hussein's ouster in 2003. Since 2003, however, the ethnic cleansing and discrimination rampant in Hussein's Iraq have not been forgotten by either Iraqis or their American occupiers.

When American forces deposed Hussein and subsequently aimed to build a new government, they purged all government offices of Ba'athists, loyal ideologues and passive technocrats alike.[12] Americans relegated the responsibility of drafting a new constitution and building a new government largely to the Shiite Muslims, only reinforcing the ethnic hostility nurtured in Hussein's Iraq. Meanwhile, a class of newly unemployed and disenfranchised Sunni Muslims turned militant against the American occupation and against their Shiite and Kurdish supporters. In turn, a wave of Shiite militant groups formed to address the Sunni violence. This violence begat classic ethnic unmixing, as towns and whole regions began to be identifiable as Sunni, Shiite or Kurdish strongholds. Conditions such as these severely complicate the process of

library/publications/the-world-factbook/index.html>>.

10 Marr, Phebe. *PRI: The World*. "History of Iraq: Part II The Rise of Saddam Hussein." Ed. Jeb Sharp. 12 February 2003. <<http://www.theworld.org/?q=node/5554>>.

11 Bull, Bartle Breese. "Will the Kurds go Home?" *The New York Times*. 9 June 2004. Accessed 8 December 2007. <<http://query.nytimes.com/gst/fullpage.html?res=9902E1DD1630F93AA35755C0A9629C8B63>>.

12 Wong, Edward. "Mayhem in Iraq is Starting to Look like Civil War." *The New York Times*. 5 December 2004. Accessed 7 December 2007. <<http://www.nytimes.com/2004/12/05/weekinreview/05wong.html?pagewanted=1&_r=2&oref=slogin>>.

building a new and unified Iraqi republic.

The latest blow to this process has been recent reports of mass corruption in the Iraqi government. As Damien Cave reports in a recent *New York Times* article, among Iraqi and American officials, "there is a growing sense that, even as security has improved, Iraq has slipped into new depths of lawlessness." [13] Stolen government property can now be found on the black market selling at inflated prices, as well as drugs and medications. With estimates of unemployment reaching 40%, $500 bribes become the only way to secure a government job. Corruption in Iraq ranges from top to bottom, from a profit-directed enterprise to a method of survival. What the unceasing pilfering more clearly demonstrates, however, is the lack of confidence in the Shiite-led democratic nation-state. One Shiite tribal leader quoted in the article offered an analogy: "It's a very large meal," he claimed, "and everyone wants to eat." Whether such consumption is the product of famine or gluttony, the corruption it entails constitutes one more hurtle to the legitmacy of the struggling government.

In addition, the undermining of traditional economy only nourishes Iraqi ethnic conflict. Cave notes, "Some American officials estimate that as much as a third of what they spend on Iraqi contracts and grants end up unaccounted for or stolen, with a portion going to Shiite or Sunni militias." In this sense, American aid sponsors both the struggling legitimacy of the current Iraqi government and the violent campaigns of sectarian violence that seek to undermine it. This process of corruption both begins and ends with disbelief in the current government's ability to govern.

In sum, the situation in Iraq reflects the model of ethnic conflict and the collapse of the modern nation-state elucidated above. While Hussein's government, centralized and oppressive, was able to keep a monopoly on violence that ensured their power over a unified whole, the leader's removal and the dispersal of power brought to the fore the latent ethnic conflict fostered in the previous regime. The pattern of suppressing ethnic nationalism while reinforcing ethnic identity as a necessary form of political participation was continued by the American plan to turn the bulk of power over to the Shiite majority. Further, the subsequent cycle of ethnic violence and unmixing is evidenced in the acknowledged areas of dominance of Sunni or Shiite militias. Hussein's effort to disperse the Kurds throughout Iraq correctly anticipated that their mixing with Sunni and Shiite populations would weaken their ability to fight back and stall any attempt at secession. That process is being reversed today, another reflection of the new central government's inability to monopolize the violence that produces ethnic unmixing. The corruption

13 Cave, Damien. "Nonstop Theft and Bribery Stagger Iraq." *The New York Times*. 2 December 2007. A1, A14.

in Iraq is simply another indicator of the nation-state's decay into ethnic identity, conflict and unmixing in which the category "Iraqi" holds less and less meaning. Given these similarities to the fragmentation of the former Yugoslavia, it is reasonable to expect a similar outcome.
It is further interesting to note that ethnic tension and territory disputes still plague the former Yugoslav states today. The February 2008 declaration of independence by Kosovo (a predominantly ethnic Albanian region of Serbia which has been under UN control since 1999) has resulted in protests and rioting by Serbian nationalists, a call for new Serbian elections and has jeopardized Serbia's entry into the European Union.[14] Once acknowledged, ethnic identity and unmixing do not simply fade with time. Similarly, in Iraq, although recent estimates chart sectarian violence at a new low, a recent article by CNN reporter Joe Sterling suggests that one reason for this decline may be "because of the demographic shifts that have made mixed neighborhoods either all Shiite or all Sunni."[15] With unmixing complete in some areas of Iraq, the recent calming of ethnic violence may only be a sleeping lion.

What can be gleaned from this comparison is either the absolute incompatibility of different ethnic groups in one state or the fundamental dysfunction of the modern nation-state. I argue the latter, that the fits and starts of Iraq are best interpreted as the death-rattle of political modernity. The last fifty years has seen the collapse of empires, like the Soviet Union, the death of multi-ethnic nation-states, like Yugoslavia, and the consolidation of sovereign states under the umbrella of supranational governing bodies, like the European Union. The ideal modern nation-state does not exist and cannot exist given the inequities it wreaks against a diverse human population. The racial and ethnic conflicts defined by social modernity find expression in the political modernity of the nation-state. As monopolies on violence and taxation are undermined by the globalized world in which we live, the anachronistic methods of governing multi-ethnic nation-states in line with these modern imperatives are increasingly ineffective and ill-directed. Iraq is a prime example of the inadequacies of political modernity and the necessity of a new, post-modern political structure.

14 "Serb PM dissolves government." CNN.com. 8 Mar 2008. Accessed 14 Mar 2008. <http://www.cnn.com/2008/WORLD/europe/03/08/serbia.ap/index.html?iref=newssearch>

15 Sterling, Joe. "Some progress in Iraq's powder keg a year after surge." CNN.com. 22Feb 2008. Accessed 14 Mar 2008. <http://www.cnn.com/2008/WORLD/meast/02/22/iraq.surge/index.html#cnnSTCText>.

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"One Whirl of Amusements": Examining the Evolving Role of the Royal Mistress from Lillie Langtry to Alice Keppel

In 1901, Henry James, the celebrated chronicler of European decadence and corruption, lamented the passing of Queen Victoria, whose reign propelled the British Empire to the height of its influence. James, however, expressed more sorrow over the ascension of Victoria's heir, Albert Edward, whom he called that "arch vulgarian, Edward the Caresser," than the death of the queen.[1] James fondly remembers the Queen—"She was always nice to us"—but has no kind words for her son, complaining that, "We grovel before fat Edward."[2] Edward VII (1901-1910) fully earned the title "Caresser" that Henry James bestowed on him. Long before he ascended the throne, Edward's gluttony, gambling, and extravagance were legendary. It was his frequent and scandalous affairs, however, that outraged the public, particularly the prudish queen. While Edward's carousing is often considered the defining quality of the man who waited fifty-nine years to ascend the throne, those responsible for his reputation, his mistresses, are frequently overlooked. In particular, Edward's first and last official royal mistresses are significant; both Lillie Langtry and Alice Keppel fully inhabited the role of royal mistress, but with far different results, each leaving a distinct mark, shifting the role of royal mistress from ornamental concubine to the position of surrogate wife.

In order to fully appreciate the nature of Lillie Langtry's and Alice Keppel's individual roles as royal mistress it is vital to understand the man who raised them to such heights of fame. Born November 9, 1841, the young heir, Albert Edward's early years were spent in relentless attempts to educate the Prince of Wales according to his father, Albert's, impossible standards. Boarding school was never considered by Victoria and Albert, as they feared the less than desired moral influence of other boys.[3] As such, Edward, known as Bertie, spent a lonely childhood within

1 Theo Aronson, *The King in Love: Edward VII's Mistresses: Lillie Langtry, Daisy Warwick, Alice Keppel and Others,* (New York: Harper and Row Publishers, 1988), 209.

2 A.N. Wilson, *After the Victorians: The Decline of Britain in the World*, (New York City NY: Farrar, Straus, and Giroux, 2005), 6.

3 Stanley Weintraub, *Edward the Caresser: The Playboy Prince who Became*

the constricting confines of parental protection. Despite his efforts, Albert could not mold his wayward son into an impeccably-educated and sober-minded heir. His tutors reported that he was obstinate and bad-tempered, often flying into rages and hurling whatever was at hand against the walls.[4] Edward's carefully orchestrated education proved to be a disaster, forever distancing him from his intellectual father and his disapproving mother.

Despite The Royals' disapproval of their son's complete disregard for learning, and over-fondness for eating and foppish dress, it was his sexual initiation that would forever taint his character in their eyes.[5] In the summer of 1861, nineteen-year-old Bertie attended a ten-week military training course near Dublin. It was Albert's hope that this experience would instill some much-needed discipline in his son's character. Bertie had always been interested in military life, most likely due to his love of uniforms, but his summer at Curragh Camp would exceed even his own expectations. It was glaringly apparent to Bertie's fellow officers that the prince had spent a sheltered childhood, and they resolved to introduce their young charge to the delights of sex. Bertie returned to his quarters one night to find Nellie Clifdon, an Irish prostitute, whom his friends had obligingly smuggled into camp.[6] This process was repeated nightly, and Bertie became so fond of Nellie that he arranged for her to follow him to England when he left Curragh Camp to continue his studies at Cambridge.

The scandal eventually came to the attention of Bertie's parents, and Albert traveled to admonish his son, calling the affair, "The greatest pain I have ever felt in my life."[7] Although Bertie was entirely remorseful in the face of his father's reproaches, the stain of national scandal proved to be too much for the overworked Prince Consort. Within weeks, Albert collapsed, after contracting typhoid fever, and died on December 14, 1861. Victoria blamed the shock of Bertie's sexual initiation for her husband's sudden death.[8] She withdrew entirely from the public scene, and, for the first weeks of her widowhood could barely stand to the sight of her heir. She wrote to her daughter Vicky, "I never can or shall look at him without a shudder as you may imagine."[9] The death of the Prince Consort would naturally have allowed Bertie opportunities to replace his father in several functions, but Victoria would not hear of it. She decided

King, (New York: The Free Press 2001), 10.

4 Ibid, 20.

5 Ibid, 101.

6 Anita Leslie, *The Marlborough House Set: An Intimate Account of the Scandalous, Romantic Escapades of Victorian England,* (Garden City, NY: Doubleday and Company, 1973), 23-24.

7 Ibid, 24.

8 Ibid, 24.

9 Stanley Weintraub, 101.

that Bertie's weak character and moral laxity rendered her son unfit for any administrative responsibilities. These defects, she concluded, would best be curbed by marriage.

Despite his mother's good intentions, Bertie's marriage would prove to be a catastrophe. Perhaps if a candidate had been more carefully chosen, Bertie would not have spent the next 48 years spurning his dull wife for the company of other woman. A marriage had been arranged for Bertie prior to what the queen called, "That dreadful business at the Curragh."[10] The candidate chosen to curb Bertie's wandering eyes was Princess Alexandra of Denmark, a shy, cold beauty, the antithesis of the women Bertie preferred. The queen was stubbornly clung to Albert's previous plans saying, "The marriage is the thing, and beloved Papa was most anxious for it."[11] Bertie and Alexandra, at the tender ages of 22 and 18, were married in March of 1864.

The newlywed heirs, after their honeymoon returned to enjoy the freedom that marriage promised. Bertie, no longer hampered by tutors and official watchdogs, continued to be denied any administrative responsibilities. Suddenly endowed with an income, Bertie lost no time in enjoying himself to the fullest. The royal couple took up residence in Marlborough House, which would witness of many a raucous evening over the next forty years. Bertie and Alix began to organize their own social circle consisting of other bored and high-spirited young aristocrats. The young couple, according to the queen, enjoyed themselves far too excessively. She tartly informed her son, "If you ever become King, you will find all these friends *most* inconvenient and you will have to break with them all."[12] The exploits of the "fast" Marlborough House Set soon became notorious. According to Anita Leslie, whose grandmother, Leonie Leslie and great aunt, Jennie Churchill, were first-hand observers of the Marlborough House Set:

After all the years of restraint, this glamorous young pair [Bertie and Alix] proved perfect social leaders. They would set the tone not only for England but for Europe. . . . Albert Edward, Prince of Wales, would personally dictate the code of social behaviour for the next fifty years, and it would be unique in history.[13]

Bertie's influence in the social arena was especially felt in the all-encompassing spheres of dress and decorum. The very rituals for dinner parties shifted dramatically due to the foibles of Bertie and his set. Bertie conducted his social interactions precisely the way he preferred, losing

10 Anita Leslie, 25.
11 Ibid, 25.
12 Keith Middlemas, *The Life and Times of Edward VII*, (Garden City, NY:Doubleday and Company, 1972), 69.
13 Anita Leslie, 28.

no time instituting the guidelines that would come to characterize the Edwardian dinner party. "The innovations and changes the Prince introduced sprang entirely from his own preferences. He liked to be comfortable and he hated being bored. He insisted on pretty women and entertaining men."[14] This requirement proved to be too much for the Princess of Wales. In spite of Alexandra's regal beauty, she failed to capture Bertie's interest. Quiet and withdrawn, she became increasingly reclusive. While his wife endured pregnancy after pregnancy, Bertie continued to engage in the activities that would define him to later generations: gluttony, gambling, and, especially, love-making.

Edward's many affairs were conducted against the landscape of Victorian middle class morality. Victoria's reign is often remembered as an age that demanded adherence to a strict and regulated moral code. This code especially emphasized sexual abstinence before marriage and strict expectations for sexual fidelity within wedlock.[15] Also included were the spheres of gender and sexuality, though the Victorians would make little distinction between the two. During most of the 19th century, the roles of men and women were separated by a system of rigid demarcations, allowing men greater professional, educational, political, and, especially, sexual freedom. Women, however, were confined to the protection of the home, destined to be wives, mothers, socialites, and jealously guarded ornaments. Refusal to adhere to this system resulted only in social ostracism and ruin.[16] It was against the backdrop of this rigid system that Lillie Langtry and Alice Keppel entertained the Prince of Wales and later the King of Britain.

Edward's multitude of mistresses and lovers was a diverse lot. Among his collection of conquests were English aristocrats, French noblewomen, American heiresses, and leading ladies of the stage. Despite the striking commonalities of appearance, personality, and background Lillie Langtry and Alice Keppel shared, during their respective reigns as royal mistress each employed dramatically different approaches to the role. Mistresses were nothing new to royal history, but Victoria and Albert set a precedent for the morality of a British monarch, maintaining strict fidelity throughout their marriage. Thus, Edward halted the temporary standards of morality created by his parents, renewing the extra-marital traditions of his great uncles. Simultaneously, Langtry and Keppel redefined the role of royal mistress. One reverted to the age-old function, becoming yet another highly popular ornament, lauded for her defiance of social expectations. The other, eighteen years later, would expand that role to include the unprecedented duties of surrogate wife,

14 Virginia Cowles, *Edward VII and His Circle,* (London: Hamilton, 1956),133.
15 James Laver, *Manners and Morals in the Age of Optimism 1848-1914,* (New York: St Martin's Press, 1967), 38.
16 Ibid, 34.

friend, lover, maternal figure, and political advisor.

Langtry was a glittering addition to Edward's life, her position purely decorative. She was lovely, witty, daring, and ambitious. It is just these qualities that defined her as a mere ornament, not considered an equal at any time during her affair with the Prince of Wales. It was not Langtry's sparkling personality that first captured Edward's attention, merely her beauty. Lillie was wildly popular long before her relationship with Edward. A shy Jersey native, Langtry became an overnight success. Shortly after arriving in London, the newly-married Mrs. Edward Langtry encountered Lord Ranelagh and his daughters, acquaintances from Jersey, and was promptly invited to several afternoon parties. Langtry maintains, "Our meeting with Lord Ranelagh completely changed the current of my life."[17] At one such social gathering at the home of Lady Seabright, she encountered the man who would launch her to the attention of the public: Sir John Everett Millais. Langtry remembers:

I wore a very simple black, square-cut gown . . . with no jewels – I had none – or ornaments of any kind. Very meekly I glided into the drawing room . . . and then retired shyly to a chair in a remote corner, feeling very unsmart and countrified. Fancy my surprise when I immediately became the centre of attention, and, after a few moments, I found that quite half the people in the room were bent on making my acquaintance.[18]

It is Millais whose acquaintance was responsible not only for Langtry's rapid rise to public awareness, but also for her life-long sobriquet: the Jersey Lily. Millais, also a Jersey native, escorted Langtry to dinner and, as she remembers, "His compelling personality made me readily consent that he should be the first painter to reproduce on canvas, what he called, the 'classic features' of his countrywoman. And so ended my first night in London society."[19] This ordinary gathering dramatically altered Lillie Langtry's life. In her memoirs, she recalls the flood of invitations from complete strangers that descended on her house the following day. "A complete transformation seemed to have taken place in my life overnight. It was quite staggering, and thenceforward visitors and invitations continued to pour in daily."[20] This instant upgrade in Langtry's social status was due entirely to her reputation as a beauty. The timid young woman at Lady Seabright's dinner party displayed none of the quick wit and sense of fun that would later captivate friends and audiences. Not only was London society bent on making the acquaintance of the lovely Mrs. Langtry, but the leading artists of the day flocked to capitalize

17 Lillie Langtry, *The Days I Knew,* (New York: George H. Doran Company, 1925), 37.
18 Ibid, 37-38.
19 Ibid, 39.
20 Idem.

on the public demand for mass reproduction of her face on canvas.

Langtry's serendipitous introduction to John Everett Millais at Lady Seabright's resulted in an almost immediate sitting. Thrilled to have her "classic features" captured by such a famous artist, Langtry was disappointed by his approach. "I was surprised, and certainly disappointed, to find that it was his intention to paint me in my plain black gown . . . I had hoped to be draped in classic robes or sumptuous mediaeval garments."[21] The result was *The Jersey Lily*, in which Millais depicted Langtry standing, dressed simply and holding a small lily native to the island of Jersey. The portrait won her instant notoriety, partially due to the reputation of the artist, but mainly because of the simple grace and beauty of the model. Langtry remembers, "'The Jersey Lily' was duly exhibited at the Royal Academy of Art, hung in a favoured place, and created so much interest that it had to be roped around to preserve the portrait from injury by a crowd which constantly surged around it."[22] Shortly after the completion of the *The Jersey Lily*, hasty copies were being sold by London street vendors to satisfy the appetites of the ever-insatiable, admiring public. Millais's portrait of Langtry instantly propelled her to fame. She quickly became known as the little country girl with one black dress. She was painted by Edward J. Poynter later that year as well as George Frederick Watts, who adopted Millais's method and painted Langtry in her black dress and a straw bonnet.[23] It is obvious that her popularity was as much due to the simplicity and innocence that she radiated with the aid of her shrewd painters, as much as her striking appearance.

It was no small coincidence that Langtry's meteoric rise to prominence coincided with another historic development: the advent of photography. "Already in 1837, the invention of Nicephore Niepce, taken up by Daguerre, made it possible to dispense with lithography and other means of reproduction and to offer the public a picture taken from life."[24] Although photography had been in use for decades, by 1878, the year of Langtry's introduction into London society, it had shifted its direction. Rather than merely being used to document important events or to capture formal portraits, this newest form of media began to circulate photographs of what were called Professional Beauties. The P.B.s were usually noblewomen who allowed pictures of themselves in various poses to be sold to the general public. Langtry clearly recalls the phenomenon: Photography was now making great strides, and pictures of well-known people had begun to be exhibited for sale . . . . They [The P.B.s] were portrayed in every imaginable pose. Anything the ingenuity of the camera-

21 Ibid, 51.
22 Ibid, 53.
23 Ibid, 55.
24 Laver James, 61.

man could devise to produce an original or startling effect was utilised with more or less happy results. Some smothered in furs to brave photographic snowstorms; some sat in swings; some lolled dreamily hammocks; others carried huge bunches of flowers . . . and one was actually reproduced gazing at a dead fish![25]

Thus photography made its debut as the most effective tool for contributing to the continuing cultural discourse that media had yet introduced. The P.B.s and their pictures are significant for several reasons. One of the most obvious is the sudden circulation of real rather than contrived representations of the female body. These representations depicted women in any number of poses, ranging from coy to seductive, usually in shots of the entire body. What formerly was considered scandalous and crass was now the object of a nationwide craze, demanded by a public long restricted from anything hinting of scandal. The photographs of the P.B.s represented to the public the average well-to-do woman, who was admired solely for her beauty and daring, and rather than receiving ostracism for her brashness, was applauded and adored.[26] Hence the subliminal messages promoted by these photographs were instrumental in creating more accepting and even approving middle class attitudes towards morality. Thus the seemingly insignificant photographs of costumed women became a transmitter via media of cultural values previously not allowed by conservative publications.

Also, these photographs allowed the middle class a glimpse into the decadent and privileged world of the nobility that had previously been distant and aloof. The vast majority of the Professional Beauties were aristocrats. Langtry names several of the most memorable Beauties, who included well-known noblewomen, such as Lady Dudley, Mrs Cornwallis-West, the Duchess of Leinster, the Duchess of Rutland, and the American Minnie Stevens.[27] The likenesses of the P.B.s were equally popular among the upper and middle classes, and sought after by members of both sexes. The P.B.s created a more personable and approachable nobility. With the aid of photography, now members of the greatest families in Britain could be identified as ordinary faces.[28] As their faces and figures came under greater scrutiny, so did their personal lives, including their cavalier attitudes towards gender and sexuality. Almost imperceptibly, middle class Victorian values, that had for so long defined the nation, began shifting to mirror those of their new role models. Rather than wishing to imitate the formal and prudish queen, much of the middle class was preoccupied with following the scandalous actions of their monarch-to-be and his circle of pleasure-seeking friends. With the

25 Lillie Langtry, 42, 47.
26 Ibid, 42-48
27 Ibid, 47-49.
28 Ibid, 44-50.

advent of photography, much more than pictures of captivating women was being circulated to the public. The values of the upper classes, and especially Edward, began to filter down to the masses, altering forever the Victorian cultural constructions of gender, sexuality, and class division in the ever onward march of cultural discourse.

With the demand for beauties to be photographed, it is not surprising that Langtry was soon requested as a model, her reputation as Millais's "Jersey Lily" preceding her. Thus she popularity, though perhaps initiated by the paintbrushes of Millais and Poynter, was elevated to its zenith by her career as a Professional Beauty. Langtry boasted, "The photographers, one and all, besought me to sit." Ironically, she recalls her own impressions of the stylish rage long before she joined their ranks:

> I had occasionally stood and studied photographs of the recognised beauty, Lady Dudley, which had found their way into the little stationer's shop of St. Heliers in my quiet Island, and I sometimes wondered what it must be like to be such a great and fashionable beauty.[29]

Langtry was quickly added to the myriad of Beauties, but her photographs induced a fascination not only with her face, but also her personal life. Soon, her photographs were being mass distributed, and the widespread likenesses brought some financial contribution to the modest income of the Langtry household.[30] Despite this welcome relief, she did not hesitate to complain about the accompanying annoyances of fame: "They [the pictures] made the public so familiar with my features that wherever I went – to theatres, picture-galleries, shops – I was actually mobbed. Thus the photographs gave fresh stimulus to a condition which I had unconsciously created."[31] With the aid of photography, Langtry's face was seen in shops all over London and those unfortunate enough to resemble her were chased through the streets.[32] Langtry recalls London's sudden mass hysteria in her memoir: "It was very embarrassing, and it had come about so suddenly that I was bewildered."[33] The extent of her influence is evident from the reports that even sedate dowagers clambered onto chairs at balls to catch a glimpse of Mrs Langtry.[34] The craze for Langtry's likeness was not limited to the general public and the nobility; it even infiltrated the royal family. Long before Bertie met the charming Jersey Lily, his brother, Prince Leopold was an admirer. Langtry records that the prince was a frequent guest in artists' studios when she was being sketched. One finished portrait of Langtry's profile surrounded by faint lilies was hung by the admiring prince over his bed

29 Ibid, 45.
30 Theo Aronson, 47.
31 Lillie Langtry, 42.
32 Ibid, 43-44.
33 Ibid, 43.
34 Theo Aronson, 45.

in Buckingham Palace. The sketch retained its prominent location until one day the disapproving queen disposed of it, climbing on a chair to remove the offending portrait herself.[35] Langtry's charm and wit, however, were not fully displayed until her affair with the Prince of Wales. Her photographs soon found their way into the Paris press, and the readers of American newspapers soon became as familiar as the British public with her features. Within a year of her discovery at Lady Seabright's party, she had become the most successful of all the Professional Beauties in London.

Not only were Langtry portraits and photographs demanded and adored, her dress and manners were subjected to intense scrutiny and meticulously imitated. An unparalled example of her ability to influence fashion is the Lily Torque. Langtry, ever the adventurer, one day dismissed the acceptable millinery and wound her head with a swath of velvet and crowned it with a feather. Overnight it became a fashion craze, and by morning no milliner's shop in London dared to open without The Langtry Torque proudly displayed in its windows.[36] The Langtry Torque was quickly followed by the Langtry shoes.[37] The flamboyant headdress would eventually adorn the Jersey Lily Knot, a hair arrangement modeled after Langtry's own loose style.[38] The daring, pink gown she donned for the Ascot races instantly became the new favorite and that shade of pink in high demand. This fanaticism became routine and expected from the hysteria that Langtry dubbed, "A craze which was one of the silliest that ever attacked Englishwomen."[39] From the intense hysteria and mobs of admirers, it is easy to understand how Bertie's interest in the public's new darling could not help but to be piqued. Thus it is undoubtedly Langtry's reputation as a great beauty, spread far and wide with the aid of the Royal Academy's finest students and many clever photographers, which first prompted the Prince of Wales to request an introduction to the woman whom Millais claimed had no equal.[40]

In addition to Langtry's famous beauty, Bertie was captivated by her spirit and wit. She is recorded to have mischievously dropped ice down the back of her dignified royal lover, which distinctly cooled his affection. Langtry denied the story, but several eyewitnesses recorded it, and soon the tale was repeated all over London.[41] Although Bertie enjoyed her high jinks and bursts of spontaneity, he was a strict observer of protocol and deplored bad manners. Langtry's vivacity and good sense

35 Lillie Langtry, 58.
36 Noel B.Gerson, *Because I Loved Him: The Life and Loves of Lillie Langtry,* (New York City, NY: William Morrow and Company, 1971), 40.
37 Lillie Langtry, 43.
38 Noel B.Gerson, 40.
39 Lillie Langtry, 48.
40 Theo Aronson, 44.
41 Ibid, 47.

of fun, at first entertained the king, who had spent so much of his life surrounded by dour and disapproving authority figures, but eventually, it became a source of annoyance to him.[42]

Ultimately, it was Langtry's high spirits and lack of restraint that ended the affair. In early 1880, Langtry began a simultaneous relationship with Louis, Prince of Battenberg which would culminate before the year was out.[43] This in itself was not enough for Edward to abandon her. But the combined forces of the Prince of Battenberg and Sarah Bernhardt proved too much for Langtry. Sarah Bernhardt, a famous actress and predecessor of the "vamp," managed to entertain Edward as his mistress was enjoying the attention of her new lover. Ultimately Bertie, who for all his defiance of Victorian morality was a strict observer of protocol, grew tired of Langtry's unpredictable actions. Aside from the embarrassing ice incident, she once served tea to the prince and, in full view of his wife and daughters, pressed her lips to the rim of the cup before handing it to Edward. The prince, highly indignant, immediately set it down, demanded another one and strode away without speaking another word to her. [44] What sealed Langtry's fate, however, was her pregnancy. It was obvious to the public that Edward Langtry's frequent "fishing trips" prevented him from being responsible for his wife's expanding waistline. Her extravagance and recklessness had caught up to her. "The Prince of Wales was losing interest in her; society was beginning to cold-shoulder her; she was five months pregnant by Prince Louis who had deserted her; even her husband had all but disappeared."[45] Langtry retreated to Jersey and never returned to the same glorified and adored position she had held in London. Her removal to provincial Jersey was the subject of much discussion. "Mr and Mrs Langtry have given up their London residence, and for the present Mrs Langtry remains in Jersey," the *New York Times* remarked, and continued by asking the question on everyone's lips: "Is beauty deposed, or has beauty abdicated?"[46] Langtry, although temporarily deposed, would return, yet not as the adored Professional Beauty. She returned as a working woman and gained a following nearly as devoted to her as before, though the shine of innocence had been tarnished. Langtry, not surprisingly, took to the stage, and would take London and eventually America by storm with her humor and beauty. The woman who claimed in an 1889 interview with the *Pall Mall Gazette*: "Oh, my tastes always accommodate themselves to surrounding circumstances. I can live happily in the greatest luxury or with perfect plainness" would never be forced

42 Idem.
43 Ibid, 90.
44 Ibid, 87.
45 Ibid, 91.
46 Idem.

to because of her ingenuity and the sheer force of her personality.[47] Despite her wild popularity as the mistress of the Prince of Wales, Langtry was not an original. Her beauty was arresting, her personality amusing and unique, but she was neither innovative nor compelling in her role as the heir's mistress. Those qualities would be left to her successor, Alice Keppel, who through her discretion would manage to avoid the scandal that Langtry seemed to attract, and hold Edward's attention and admiration for the final years of his life. Langtry is now remembered as an actress and a great personality. The qualities that first captured the fickle attention of the Prince of Wales are also those that ensured her downfall.[48]

In sharp contrast to the short-lived, high-profile romance between the Prince of Wales and his amusing and beautiful trinket, is the relationship between Bertie and Keppel. The distance between Edward's affair with Langtry and his relationship with Keppel spanned eighteen years. In those 18 years, the prince had paid court to many women, but none like Keppel. When the Prince met the twenty-nine year old Mrs George Keppel in 1898, he was 57 years old, and his interest in Mrs Keppel is a fascinating indication of his age.[49] His mother ailing, Bertie was suddenly facing the responsibilities he had spent his entire existence waiting for. Keppel was unlike any woman he had previously been attracted to. She was beautiful, to be sure. Edward would have demanded no less of any of his lovers. She most likely was the only mistress Edward ever took who had affection for him equal to his for her.[50] In short, she was his first and only mature, romantic relationship. Keppel combined the roles of wife, mother, friend, lover, and political advisor to create an entirely new type of royal mistress. Theirs was a partnership in which Edward acknowledged her equality with him. Edward's desire to share the final twelve years of his life with Keppel is a testament, not only to her discretion and astute capabilities, but also to Edward's affection and dependence on her.

Perhaps most fascinating about Edward's affair with Keppel, are the strides he took to create a replacement family with her assuming the position of surrogate wife. Although Edward had traveled with nearly all his mistresses, he had not involved himself with their families and not always excluded his wife and various other friends. Edward's relationship with Keppel is significant as she was not only married but had two daughters at the time of her affair with the prince. His children grown

47 "Lillie Langtry," in *The Norton Book of Interviews: An Anthology from 1859 to the Present Day,* ed. Christopher Sylvester (New York: W. W. Norton & Company, 1996), 97.

48 Theo Aronson, 87.

49 Raymond Lamont-Brown, *Edward VII's Last Loves: Alice Keppel and Agnes Keyser,* (Phoenix Mill: Sutton Publishing, 1998), 61.

50 Ibid, 72.

and his wife increasingly secluded at Sandringham, Edward lost no time in developing the intimate family he had always lacked. Keppel's daughter, Sonia, recalls Edward's casual calls to the Keppel household: Sometimes King Edward . . . came to tea with Mamma . . . . On such occasions, he and I devised a fascinating game. With a fine disregard for the condition of his trouser, he would lend me his leg, on which I used to start two bits of bread and butter (butter side down) . . . . Then bets of a penny were made . . . . Sometimes he won, sometimes I did. Although the owner of a Derby winner, Kingy's enthusiasm seemed delightfully unaffected by the quality of his bets.[51]

Bertie's marked affection for Keppel's daughters reveals not only the difference in his affair with her but also the effects of age. Time had not dulled his appreciation of beautiful women or made him any less interested in gambling and gossip. Rather, the fact that he chose to invest himself in one woman and even her family for the last 12 years of his life speaks as much to his desire to create a more stable and comfortable environment as to Keppel's ability to hold his attention. Bertie left no record of his affection for her children, but their warm memories of him firmly establish his attachment. "In my life, Kingy filled the place of an accepted, kind, uncle, of whom I was much less in awe than I was of my Uncle Harry," Sonia Keppel states, "Kingy's advent had always meant fun to me."[52] Not only did Bertie establish himself as some sort of benevolent father-figure to Sonia and Violet, her daughters, but the position that Keppel occupied was never disputed to be any other than that of a wife.

Unlike her predecessor, Lillie Langtry, few portraits or photographs of Keppel exist. This fact alone is a testament to her discretion. While likenesses of Langtry's face were being sold in every shop window in London in 1878, there was no such craze during Keppel's twelve year installment as mistress. There is, however, one photograph that reveals her desire to make a deliberate statement. Rather than carelessly flaunting her position, as Langtry had done 18 years earlier, Keppel was careful to craft a faultless image of herself as a loving wife and devoted mother. One particular photograph published on the September 1899 edition of *Country Life* perfectly captured the image that she was carefully molding. The photograph reveals Keppel seated next to a window with an infant Violet in her lap. The picture is one of laudable domesticity. Violet gazes trustingly up into her mother's lovely face, one arm wrapped around her neck, her chubby, bare legs protruding from under her frilly skirt. Keppel is bent toward towards her daughter as though whispering secrets to her. The entire scene projects an undeniable sense of devoted maternal love.[53]

51 Sonia Keppel, *Edwardian Daughter,* (London, Hamish Hamilton, 1958), 23.
52 Ibid, 52.
53 Ibid, 49.

This photograph taken about the time Keppel began her affair with the king would have been intended to establish her as an upholder of traditional values as a decorous and attentive mother. However, upon closer inspection, it is evident that the scene was carefully contrived to send a specific message. Keppel's clothing in this photograph is telling. Her Worth gown, composed of yards of intricate lace and decorated with pearls, is no nursery playtime garb. "The intimacy is contrived. Such clothes were never meant for cuddling a child. She is about to put her down and pack her off with nanny."[54] This photograph was no family snapshot. It was created with deliberate purpose and that was to dispel any qualms as to Mrs Keppel's willingness to adhere to social mores. This is especially fascinating in light of the fact that George Keppel was questioned as Violet's father.[55] Her role as king's mistress could be overlooked, but her rejection of hearth and home would have been a far greater scandal.

The activity that established Keppel and her daughters as a second family to the aging king was their annual early spring holidays to Biarritz, France. Leaving behind their respective spouses, Edward and Alice escaped the pressures and responsibilities of London and were free to merely enjoy each other and her daughters. Those few short weeks every spring were the sole occasion when, "Alice Keppel was Queen."[56] It was in Biarritz that the king's health improved, being far removed from the smog of London, and he would revel in the French cuisine he so admired. Biarritz offered the simplicity and gaiety that Edward craved and while there he walked unrecognized and picnicked with Alice, Violet, and Sonia. Little Sonia remembers:

Kingy liked to think of these as impromptu parties. . . . Much of Kingy's enjoyment of these picnics was based on his supposed anonymity and, delightedly, he would respond to an assumed in his deep, unmistakable voice, unaware that most of the crown was playing up to him.[57]

It was in Biarritz that the king amused himself with his make-believe family, and, ironically, it was in Biarritz he would catch the cold that would end his life.[58]

Unlike any other of Edward's many lovers, Keppel involved herself in the political realm. Not naturally inclined to the dull business of politics, she involved herself solely in order to please Edward. Her influence in this sphere is not definitely established. However, Keppel's biographer, Raymond Lamont-Brown maintains, "Alice's dealings with

54 Ibid, 49.
55 Ibid, 48.
56 Theo Aronson, 227.
57 Sonia Keppel, 45-46.
58 Theo Aronson, 230-233.

the major political figures of the day warrant more than just a surface examination. Although it seems that she played no role in party politics. Her position in royal circles brought her much more than a political party could."[59] Keppel's influence was not highly visible; rather she employed her strengths—discretion, tact, and social savvy—behind the prestigious scenes her royal lover occupied. Her one obvious political contribution to the political arena is her role as a recognized Liberal hostess, acting as a go-between for Edward and noted Liberals. She put her skills as a gifted conversationalist and charming hostess to good use to advance Bertie's causes. What impact she had cannot be determined, but it is obvious that Bertie relied heavily on Keppel and her advice. Lamont-Brown claims:

> He completely trusted Alice and through her . . . he could make his political opinions known. A message to Alice was enough to get a controversial subject casually dropped into conversation to gauge the effect, which was then reported back to the king. The fact that the king's style began to be appreciated as effective was due in part to Alice's expertise as a discreet messenger. Consequently Alice was privy to a wider range of secrets than she ever admitted.[60]

Perhaps most significant was the calming influence Keppel exerted over her temperamental lover. Lamont-Brown remarks, "Sometimes her wit and diplomacy smoothed situations which would have caused her royal lover to explode with the irascibility for which he was famous."[61] Keppel was no fool, and as such, she utilized her gifts to advance a political agenda, not prompted by her own political interest or ambition, but merely out of regard for her lover.

Whatever her political role, Keppel never alluded to it, and shied discreetly away from credit for any political victory. Her cunning prevented her from mentioning her involvement even to those closest to her and always denied that she had any knowledge of politics. Her attempts at modesty were foiled by Prime Minister Asquith and his wife. "In a letter to her, Asquith once thanked her for her 'wise councils'" obviously intimating that Keppel held private political discussion with the most prominent politicians of the day.[62] Most of all, Keppel disliked it when any mention of her political association to the king was made in public. Years later, when Margaret Asquith's memoir was published in 1933, Keppel was irritated by her mention of the king's dependence on her as a political advisor.[63] Despite her level of involvement, Keppel never used her position to advance her own interests or those of her favorites. She

59 Raymond Lamont-Brown, 116.
60 Ibid, 117.
61 Ibid, 2.
62 Ibid, 117.
63 Ibid, 118.

was renowned for her ability to persuade the king, and there would have been no barrier to her using her persuasive powers in the political sphere except for her own shrewd judgment that cautioned her to remain as politically invisible as possible. "Persuasion," recalls her daughter, Violet, "was Mama's strong suit. She could have persuaded Florence Nightingale to become a ballet dancer."[64] The Austro-Hungarian ambassador warmly recalls Keppel's prudent approach: "She never utilized her knowledge to her own advantage, or that of her friends . . . It would have been difficult to find any other lady who would have filled the part of friend to King Edward with the same loyalty and discretion."[65] This role of political confidante and go-between was not attempted by any of Edward's other mistresses, nor is it likely that he would ever have employed the capricious and sometimes reckless Langtry in the same capacities as he did Keppel. The qualities of wit, discretion, and cunning, which first attracted the Prince of Wales to the lovely Mrs Keppel, later made her politically indispensable to the King of England.

Not only did she inhabit the role of surrogate wife and political confidante, Keppel also took up the mantle of maternal figure in the life of the 57-year-old man she entertained. There is no record of Langtry ever displaying a maternal regard for her royal lover, but Keppel's biographies are rife with examples of her concern for the aging king. Her maternal attitude and comforting aura are qualities not actively displayed by Edward's other amours. These affirming and accepting characteristics displayed by Keppel were welcomed by a man who had not only never found them in his many affairs but who had also been deprived of affection and approval from his stern, disapproving mother.

Keppel's maternal inclinations were demonstrated on several occasions when she voiced her fear of assassination attempts on Edward's life. In particular she told the Marquise de Soveral she was concerned about the king's sojourns on the continent. An assassination attempt had been made in Brussels in April 1900, leaving a shaken but unharmed Edward, who worried that Keppel would hear of the incident and be anxious. When the couple ventured out in public, always incognito, she was tense and wary and would not relax until she had directed Bertie back to safety. The most amusing example of her constant paranoia over Edward's safety was when the couple was dining in Saint-Cloud, and Keppel spying a gentlemen in the restaurant who had what she called a "criminal face" became increasingly insistent that something be done to remove him. Keppel was nearly hysterical, until the head of the French police assured her that at every table sat several policemen to guard the king, one

64 Diana Souami, *Mrs Keppel and Her Daughter,* (St Martin's Press: New York, 1996), 69.

65 Raymond Lamont-Brown, 116.

of whom was the man with the criminal face.[66] Her anxiety for the king, though often a source of annoyance to him, speaks to her fierce protective nature and maternal concern for her lover.

Another prime example of Keppel's maternal feelings toward her lover is her frequent worries over his health. It was common knowledge that the king smoked far too much, suffered from constant coughing, frequently tripped, and was an incorrigible glutton. No one was more aware of these faults than his mistress. "Combined with her love for the Prince of Wales, Alice had deep maternal feelings toward him and as her love grew so did her worries about his health."[67] Although Keppel was renowned for her persuasive abilities, her attempts to separate the king from his smoking and massive meals were in vain. Her concerns are indicated in her letter to Marquis de Soveral shortly after Edward suffered from a slip and fall: "I want you to try and get the King to see a proper doctor about his knee . . . . do what you can with your famous tact and, of course, don't tell anyone *I* wrote to you."[68]

Keppel's directions for the king's health would be ignored until his death. In the winter of 1910, it became obvious that the king's health was declining. Edward suffered more than usual from his frequent coughing bouts. Keppel, always worried, attempted to persuade him to be away from the smog of London as often as he could, but he put up his usual resistance. The king contracted a severe cold, but refused to let it interfere with his social calendar. The king rejected advice to cancel his annual outing to Biarritz with Keppel. Once there, she wrote to the Marquis de Soveral, "The King's cold is so bad that he can't dine out, but he wants us all to dine with him . . . . I am quite worried . . . and have sent for the nurse."[69] The king vacationed in Biarritz for nearly seven weeks, ignoring all protests about his health. After arriving in England, he was confined to Buckingham Palace and never left again. On May 6, the king lapsed into a coma and never awoke.[70]

In her memoir, *The Days I Knew,* Lillie Langtry made no mention of the king's death. She blithely describes her adventures in America, her soaring popularity, and her many stage appearances. However, she failed to mention the death of not only the King of England, but the man who had plucked the Jersey Lily from London society and put world recognition within the grasp of her beautiful hands. Alice Keppel, who, in accordance with her legendary discretion, left no memoirs or diaries of any kind, was devastated. Her reaction was so dramatic that it left an indelible impression in young Sonia's head: "We were told that Mamma

66 Ibid, 82-83.
67 Ibid, 72.
68 Ibid, 74.
69 Theo Aronson, 250.
70 Raymond Lamont-Brown, 129.

was in bed and, when we were escorted along to her room, Mrs James barred our way. We went up to her bed and she turned and looked at us blankly, and without recognition, and rather resentfully, as though we were unwelcome intruders."[71] This reaction terrified Sonia who took her troubles to her sympathetic father. When asked why the king's death meant so much, George Keppel, the ever-gracious, cuckolded husband, answered, "Nothing will ever be quite the same again. Because Kingy was such a wonderful man."[72] Keppel's attachment to the man who had been her lover for twelve years is demonstrated by her deep mourning, which resembled the loss of a long-time spouse rather than a lover. In November 1910, she abandoned London, the city where she had unofficially reigned as consort, for the solitude of the continent. She claimed it was for her daughters' educations, though, in reality, it was to escape the sudden reversal of her life. She was simply the charming and beautiful Mrs Keppel once more.

Henry James, the dour American author who had mourned the passing of Queen Victoria, remained surprisingly silent on the subject of her son's demise nine years later, neglecting to applaud the death of the man he had scornfully dubbed "Edward the Caresser." In 1901, facing the end of the Victorian Age, James confided, "I mourn the safe and motherly old middle-class queen, who held the nation warm under the fold of her big, hideous, Scotch-plaid shawl . . . . I fear her death much more than I should have expected; she was a sustaining symbol—the wild waters are upon us now."[73] The "wild waters" he referred no doubt were the ascension of Edward and his policies of hedonism. While Henry James was among those who viewed Edward and his companions as nothing more than a society of reckless womanizers, Edward's influence undeniably reached further than merely the boudoir.

The bulk of Edward VII's influence lies not in his political success, administrative abilities, or his congenial relationship with Parliament. Rather his impact is felt in the arena of manners, mores, and cultural constructions of gender and sexuality. Although the pleasure-loving, carefree prince initially had no intention of dramatically altering these carefully defined cultural constructions, he was ultimately instrumental in paving the way for a more gradual blending of these roles, allowing the women he favored with his attention greater independence and sexual freedom in the arena of extra-marital relationships. Often dismissed as a failed husband and extravagant playboy prince, Edward was responsible for igniting a counter-cultural revolution that defied the social conventions of the day, earning him the enmity of the Queen and Parliament, yet winning the applause of later generations. When Queen Victoria

71 Sonia Keppel, 53.
72 Ibid, 54.
73 A N Wilson, 6.

lamented that her son "spends his life in one whirl of amusements,"[74] she had little idea that Edward's impact would be so lasting.

Yet these subtle social and cultural shifts would have been impossible without the aid of Edward's mistresses. Against the vast panorama of Edward VII's romantic entanglements, Lillie Langtry and Alice Keppel stand apart from the multitude of lovely faces. The first and last mistresses of a king who would have many, Langtry and Keppel accomplished more than simply setting standards for fashion and gracing the canvases of renowned painters. These two women, during their respective reigns as Bertie's companion, witnessed three decades (1878-1910) of dynamic change. Langtry's meteoric rise to fame was aided by the advent of photography, allowing her to become an overnight celebrity and fashion icon. The same media explosion that permitted Lillie's image to be sold on street corners, would two decades later allow casual photographs of Bertie and Alice vacationing together to be captured. The birth of photography as a major form of media also contributed to the subtle shift in perceptions of gender roles. The circulation of these photographs allowed a glimpse inside the world of sexually-aware and independent women, who neither denied nor flaunted the fact that they were the mistresses of the King of Britain.

The eighteen years separating the respective reigns of the two women also marked a distinct shift in the role of the royal mistress. From Lillie Langtry, who occupied the age-old position of lively and entertaining courtesan, to Alice Keppel who realized the potential of the royal mistress's role outside the boudoir, both women left their unmistakable marks on Edward the Caresser's life and reign. In addition to enhancing the personal life of the man who "Preferred men to books and women to either", these two women paved the way for later royal mistresses to ascend to even greater heights.[75] In particular, Alice Keppel, who though she set a precedent for the influence of the royal mistress, was still clever enough to understand the limits of her role. Years later, upon hearing of Edward VIII's decision to marry his mistress, Wallis Simpson, she tartly remarked, "Things were done better in my day."[76] Lillie Langtry and Alice Keppel, though each implanted their unmistakable mark on the role of royal mistress, understood the limits of their role that needed to be stretched and the limits that would be fatal to stretch. This shrewd approach is what allowed Langtry and Keppel to remain so admired and beloved by a society who would later reject Wallis Simpson for her inability to respect the boundaries that her predecessors had clearly understood.

74 Keith Middlemas, 69.
75 Keith Middlemas, 75.
76 Raymond Lamont-Brown, 182.

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The Difference Between Thinking and Action: the Failings of the Moral Resources

I: Introduction

Humanity stands on the brink of the abyss in our moral world. At times, we are aware of the vastness that we stand next to, gazing over our shoulder. Other times, our back is completely turned away, in naïveté. The moment of truth comes, however, when we turn fully toward the brink. Do we choose to back away, respecting the ledge and its danger? Or do we loose ourselves in the abyss and fall in? In his awesome undertaking of a look at the acts of inhumanity that darkened the Twentieth Century, Jonathan Glover, examines situations where humanity is able to back away, or falls hopeless into the chasm. *Humanity* argues that there is a terrible black thread of "psychological weakness" (Glover, 43) that runs between the inordinate evils that occurred, tying them together as products of human failing. While the latter of this argument is certainly agreed with, there are question as to whether or not it is truly a psychological weakness or something more. Glover's moral resources are at best, only necessary moral requirements to describe an average moral reaction to atrocity. One could honor the moral resources, be considered a moral entity, and nevertheless still be a bystander. Those who have acted in "exemplary" ways do much more than the average. I will argue that Glover's resources are thus inadequate when taken alone, both as a description of those heroic cases, and as a prescription for how to ethically face atrocity.

II: On the Brink of the Abyss

To begin with, it is important to understand what Glover's conception of the moral resources. In responding directly to "Nietzsche's Challenge," Glover posits the existence of the moral resources. Moral resources are human needs and psychological tendencies that either play to our moral identity, or to our "human responses" (Glover, 22). There are two types of human responses; respect and sympathy. Glover argues that respect and sympathy work both to describe the moral inclinations humans feel, and how they apply as preventative and staunching measures against immoral behavior. It is more difficult to commit an atrocity against others if they have dignity and respect (Glover, 23-24). Sympathy

unites our experiences for what it is to suffer, with other humans, thus acting as a powerful emotional control mechanism (Glover, 24).
Moral identity, Glover explains, is a series of either conscious or subconscious commitments that reflect a certain character that any given human may want to become (Glover, 26). These two divisions combine to become a strong deterrent to "ruthless selfishness" because of a greatly raised "psychological cost" (Glover, 27). Our human concern for the kind of person we may be perceived to be conflicts with a harmful self-interest, or damages what respect of ourselves or others, and what sympathy we feel with those who may be damaged by our self-interest.
Glover admits that these measures can be eroded and repaired under different circumstances; "People slide by degrees into doing things they would not do if given a clear choices at the beginning" (Glover, 35). This allows for slow degradation of respect and sympathy, and this slide happens in such a way as to not initially conflict with a moral identity. Moreover, a person committing an immoral act can be jarred back into appropriate action, as the example of a policeman being prevented by beating a woman, by handing her the shoe she lost as he chased her (Glover, 37-38).

Be that as it may, Glover's moral resources on their own are simply not enough to define the characteristics of a person who acted in an exemplary manner during an atrocity. In the recent Rwandan genocide, where 800,000 people lost their lives in a hundred days, an entire nation turned neighbor against neighbor with thousands of active participants in the killings all across the country. Thousands more sat by and watched the killings occur in their own backyards. Worse still, the brutal slaughter continued on in the full glare of the world's eyes, and nations shook their heads and did nothing. To keep from having to become involved, "the United States along with most other governments, simply avoided using the word" (Ghosts of Rwanda, 2004).

Yet, following Glover's moral resources, these parties can proclaim to be moral entities, and remain guiltless bystanders. A civilian can stand by, feel respect for those who are being butchered, feel physical pain in sympathy, know that the killing is wrong and not want to be a party to it, and still do nothing. This bystander may even have a valid excuse—as described by David Jones in his work on the characters of the participants, victims and bystanders in the Holocaust—being "prevented from acting by a lack of opportunity" (Jones, 215). A valid excuse allows the bystander to cognitively recognize that he would, under appropriate circumstances, normally not be a bystander—or act to help a person in need. However, due to prevailing circumstances, some "lack" of opportunity, the bystander in question is prevented from acting, out of fear for life and limb, or lack of resources to help. This bystander can maintain

all his moral resources intact; he may feel awful, or even guilty by not intervening, but the resources have not faltered.

This is inadequate to describe those few who acted exemplary. One example is of Philippe Gaillard, a Red Cross doctor in the capital of Rwanda during the genocide. He chose to make the news of the genocide public, despite the possibility of serious retribution and harm (Ghosts of Rwanda, 2004). The consideration of the threat of serious harm is a valid excuse for not helping (Jones 215), yet Gaillard finds himself compelled to help—beyond his foundation of moral resources:

In such circumstances, if you don't at least speak out clearly; you are participating to, to the genocide, I mean, if you just shut up when you see what you see. And morally, ethically, you *cannot* shut up. It's your *responsibility* to talk. To speak out. (Ghosts of Rwanda, 2004, emphasis mine)

Gaillard's self-description about how it feels to be merely a bystander and not react gets at the core issues to Glover's resources as a descriptive explanation of human moral action. Gaillard feels the moral resources; he works to save lives, not take them. However, it is not just sympathy or respect, it is a *responsibility* to human life.

Jones refers to these actors as "supererogatory;" going "above and beyond" average behavior, often disregarding danger to oneself (Jones, 222). Gaillard is certainly an example of this; he raised awareness of the horrors occurring around him, stayed when many others had left, and once even directly confronting the then extremist leader to stop the killings (Ghosts of Rwanda, 2004). Even though he was rebuffed, Gaillard is still to be commended; he at least *tried*.

Acting is an important part of becoming more than a bystander in an atrocity. And the moral resources fail to prescribe *how* to behave when faced with a morally trying situation. One particularly challenging example is that of the case of My Lai, when members of the U.S. army Charlie company murdered nearly 500 unarmed old men, women, and children, in an extended period of four hours. The company had sustained four killed and thirty-eight wounded before the attack, and was ordered to show aggression when storming the village, which was believed to hold a Viet Cong stronghold. This is a grueling case because U.S. military service members are supposed to be *trained* to do exactly the opposite of the case that occurred during the event. If soldiers are trained to spare innocents, and were backed up by their moral resources, how could have this atrocity occurred?

The answer lies firmly in the case that the moral resources simply are inadequate to prescribe action. Glover exclaims the case of the 120 soldiers moral failing is due to the very fact they received orders to be aggressive, and that they experienced strong peer pressure to conform

(Glover, 59). Nevertheless, there are examples of their peers who did not participate in the slaughter (Glover, 59). One such example is that of Hugh Thompson, a reconnaissance helicopter pilot, who, when seeing the massacre the American soldiers were propagating, landed his chopper in between a fleeing group of Vietnamese and a band of advancing soldiers. He ordered his gunner to open fire on the advancing troops if they attempted to shoot at the civilians.

Thompson not only risked his own life, but also defied pressures of conformity, and the commands of a superior officer to do the right thing. His moral resources alone did not prevent the further killings of innocents, but the *action* he took. Jones refers to those who feel obligated to help, to pursue the correct course of action, because of a strong sense of moral duty. Acting against, or not acting in these cases is impossible; "their sense of integrity will not allow it" (Jones, 223). Hugh Thompson's actions are seen as the highest moral regard. In William Eckhardt's discussion of the massacre, the resolution about a prescribed course of action in the face of atrocity is clear: "ACT LIKE HUGH THOMPSON" (Eckhardt). It is not enough to simply recognize and acknowledge atrocity, but regardless of the possible consequences to life and limb, take action against atrocity; it is the best moral course of action.

III: The Fog

Of course, situations where a genocide is occurring, or armed men are gunning down innocent civilians are not black and white. It could probably be argued, and I feel rightly so, that these atrocities occur simply *because* they are not clear-cut. But this is an argument for a different paper. However, this does place the moral resources into an interesting predicament. Glover argues that individually, the parts of his moral resources: moral identity and moral human responses of respect and sympathy, cannot hold back the unfortunate and innate pull of the abyss on humanity (Glover, 403-404); "to function as a moral restraint against atrocity, the sense of moral identity most of all needs to be rooted in the human responses" (Glover 404).

It could be argued that my thesis, in the same way as Glover's, falls short. The moral resources are at best only a starting place. Having them does not prevent genocide or massacre. Having them does not stop a moral soldier from shooting a child. And if this is true, then how can the moral resources prevent a moral being from simply standing by and doing nothing?

The difference is in a *responsibility to action*. As Philippe Gaillard began to treat victims, the aid workers would occasionally have to leave the country because the gross inhumanity made them "crazy; but, then you find other people, who [are] able to take risks, and to do the

very little things you can do. Which are always miracles. Do miracles. In such contexts it's the only way to do something I guess" (Ghosts of Rwanda, 2004). To be effective as descriptions for the exemplary actors, to be prescriptive for their behavior, the moral resources need another component. They fail as the Red Cross failed during the Holocaust, as the soldiers' training failed during My Lai, as the world failed as the killing continued for days and weeks and months in Rwanda.

IV: Conclusion

Alone, Glover's moral resources are simply inadequate to describe how those who act exemplary in the face of atrocities are able, and is inadequate to prescribe to others how to act in the face of an atrocity. The moral resources are, at best, only a necessary component of a moral being. In Rwanda, despite the overwhelming events, there were people, able to see the abyss before them, and step away. They helped save people, at risk of life and limb. They continued to persevere even as the tide of bodies and maimed poured over them. They felt strongly the moral resources, but they also felt a responsibility to speak out. In My Lai, a single pilot placed himself between advancing American soldiers and the innocent Vietnamese civilians they were going to kill. Hugh Thompson would not have acted had he lacked the moral resources, but he would not have acted if he had not felt a duty, an obligation to stop the killing. He watched as the men around him succumbed to the abyss that haunts humanity.

Inside each of us, there is a capacity for evil—for death and destruction. For wanton lust of violence and cruelty. This is countered by the knowledge we have, and our *moral obligation to the other members of humanity*. This is not just caring for them, or respecting them, even if we do not like them. This is a genuine concern for the well being of others. This is the tether that prevents most from falling into the abyss at our backs.

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L U C E R N A

SPECIAL SELECTION:

Sustainability

In 1942, Fortune magazine ran a cover by cartographer Richard Edes Harrison that depicted the Earth as seen from above the Pacific Ocean – a view of the Hawaiian Islands, with only a hint of the California coast to the east, separated by a vast expanse of water from imperial Japan that crouched in a blue horizon near the binding. At first, the editor rejected Harrison's cover, which was commissioned for an issue about the United States entry into World War II, as being drawn at a useless scale lacking in relevant detail. Harrison fired back, saying that this war and everything after it will be defined by the closing of such a great distance. He must have sounded like Christopher Columbus speaking before the Spanish Court four-hundred-and-fifty years earlier, his hand atop a painted wooden globe.

Today, we continue to reshape our understanding of the planet as a result of discoveries and events at local and global scales. As this journal goes to print, a special edition of the National Geographic magazine has just been released with stories about the human role in the globally changing climate, including recommended policies and behaviors that might lessen the emission of greenhouse gases resulting from the rapid consumption of organic resources. Significantly, spatial patterns, such as regional climates, are more often being scrutinized using a temporal scale, like the rate of change. Our fate and the fate of millions of species depend on our new appreciation of space and time.

This issue of Lucerna features a section dedicated to writings by UMKC undergraduate students about the interplay between humans and the environment. Chris Green's historical geography of the Hawaiian Islands provides a four-billion year perspective of environmental change, including the implications of human settlement; Tom Gault offers a review of key philosophical arguments about western society's relationship with nature; and the results of the 2007 Sustain UMKC Competition are presented to our readership. The top ten suggestions for improving the environmental sustainability of development and operations at the University of Missouri – Kansas City are excerpted, including the two

ideas voted most practicable, Emily Monroe's description of a campus-based bicycle loan program, and James Ramirez's design concept for landscaped roofing.

The editorial staff of Lucerna would like to thank everyone who contributed to this section, especially the forward thinking faculty fellows of the UMKC Honors Program, who sanctioned its creation.

Be encouraged by these writings,

Dustin Grey Jensen
Co-Editor-in-Chief

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Chris Green

The Environmental History of the Hawaiian Islands

With special acknowledgement to Dr. Daniel Hopkins, associate professor of Geosciences, for direction and support in drafts of this paper.

The plants and animals that inhabit a region are influenced by a variety of factors. The amount and yearly fluctuations in sunlight, precipitation, and temperature are among nature's controls. Chance is also part of the equation. What are the odds that a drought could eliminate the food source of an endemic species? How often does an area experience volcanic eruptions? These natural catastrophes weaken species viability, increase competition for scarce resources, and can lead to extinction. Unfortunately, our own anthropogenic activities have led to reduced biodiversity. In a world of rapidly diminishing species richness, it is important to study and learn from our worst mistakes. The history of the Hawaiian Islands is not just the sad story of irreversible ecosystem change, but also, in today's context of global climate change and mass extinction, it is a valuable lesson in positive feedback – a small disturbance has far-reaching consequences.

Trade has been a catalyst for environment alteration. The stimulus for such change in Hawaii began in St. Petersburg. European diplomats were informed in 1760 by Czarina Catherine the Great that the Russians were in northwestern North America (T.L. Snell, 1974, p. 170). Officially the English sent Cook to find the famed Northwest Passage, but he also had special instructions from the British Admiralty to determine what the Russians where doing (p. 182). In 1778, Cook sailed up from the

Pacific into the Gulf of Alaska, where he found a few Russian fur traders. Months later, Cook's ships docked in China, where his men traded the furs they had acquired cheaply from the Aleut Indians. The Englishmen sailed home with dollar signs in their eyes, because they had discovered that the Russians were making a fortune selling Alaskan sea otter pelts to the Chinese. Another discovery made on Cook's final voyage was the Hawaiian Islands.

Almost 2,400 miles from both California and Japan lay the Hawaiian Island Chain. It is composed of eight large islands and more than a hundred mainly uninhabitable islets and atolls. The easternmost island, Hawaii, is the largest and the youngest. Almost 2,600 miles to the northwest, the Kure Atoll is the end of the Hawaiian Chain. Their position between North America and Asia has made them an ideal port of call, a place where ships could resupply and transfer their cargoes. Up until 1789, British fur trading ships, following the Russian example, sailed from Alaska to China, but they went via the Hawaiian Islands (Bradley, 1942, p. 12). American, Russian, and French ships later came to Hawaii. With their cargo holds full of furs, traders stopped to buy pigs, bananas, firewood, and sweet potatoes in exchange for nails, beads, and ribbons. These sailors initiated the third major transformation of the Hawaiian landscape.

The first major alteration was an invasion of sorts which began with algae and lichens brought in on the wind as spores. They converted bare, volcanic rock into soil in the initial transformation of the Hawaiian environment. Lichens are a symbiotic combination of fungi and algae in which the fungi break down rock for nutrients so the algae can perform photosynthesis. Certain types of algae tolerate high temperatures, the high sulfur content of volcanic rock, and levels of nitrogen too low for other plants (Smathers & Meuller-Dombois, 1974, p. 87). As microorganisms and lichens increased the quality of the soil, ferns and mosses began to grow. Meanwhile, millions of years of volcanic eruptions were under way.

The island of Hawaii was formed by five different volcanoes. The tallest, Mauna Kea, is 13,681 feet high and has the steep slopes characteristic of an explosive cinder-cone volcano (H.V.O., 2006). Mauna Loa, less than forty miles to the southwest, is an enormous shield volcano, distinguishable by its gradual slopes formed from fluid lava flows. On Mauna Kea there are moraines, mounds of rock transported by glaciers, serving as evidence that Hawaii was cooler during the Ice Ages; today, snow accumulates to a depth of several feet on both summits (MacDonald et al, 1983, p. 256). Kilauea, the most active volcano, lies to the southeast of Mauna Kea and Mauna Loa. The geologically young volcano of Hualalai, in western Hawaii, is 8,300 feet high. A range of hills and low mountains

called the Kohala Mountains composes the backbone of northwestern Hawaii.

The island of Maui Nui lay less than fifty miles to the northwest of Hawaii's Kohala Mountains. Volcanoes formed the island less than two million years ago, and it existed for 500,000 years before erosion carved it into the separate islands of Maui, Molokai, Lanai, and Kahoolawe (Olson, 2004, p. 7). Maui is the second largest island of the Hawaiian chain (Hawaii itself has almost half of the state's land mass). Maui's western volcano is largely eroded, but the 10,000-foot volcano of Haleakala was active as recently as 500 years ago (H.V.O., 2006). The small islands of Kahoolawe and Lanai lie off the west coast of Maui. Kahoolawe is relatively flat, while Lanai has one extinct volcano above 3,000 feet. Twenty miles to the northwest of Maui is Molokai, where tall sea cliffs and mountains comprise the eastern portion of the island, and eroded plateaus and plains constitute its western half.

Oahu, forty miles from the west coast of Molokai, is the third largest island. It formed between two and three million years ago (MacDonald et al, 1983). There are two low-lying mountain ranges, the Ko'olau Mountains bordering the eastern shore and the Wai'anae Mountains along the west coast. Lava from the volcanoes that formed the mountains flowed together and created the flat Schofield Plateau. Northwest of Oahu is the island of Kauai, which is home to just one ancient volcano. The island formed five million years ago (Olson, 2004). The eastern and southern shores are paralleled by extensive coastal plains, while the interior is mountainous. The northeast drains into the Alakai Swamp, and nearly the entire western quarter is cut from the rest of the island by the "Grand Canyon of Hawaii" or Waimea Canyon. Another small island, Niihau, lies twenty miles to the southwest of Kauai; eroded, low-lying hills and plains make up its topography.

In 1963, the geologist J. Tuzo Wilson first proposed that the Hawaiian Archipelago was formed as the crust of the Pacific Ocean floor moved over a fixed plume of molten material from Earth's mantle (Macdonald et al, 1983, p.338). Each new volcanic island was then carried away from this geologic hotspot as the Pacific tectonic plate crept to the northwest at a rate of several inches a year. As one island's source of lava was cut off, another island was born. An entire chain of islands was formed in this way. As time went on, they were eroded by rain, wind, and waves. This is why the tallest and largest islands are also the youngest. The effect of years of erosion can be observed in the Northwestern Hawaiian Islands. They are atolls, which are old volcanic islands that have eroded or subsided and are now surrounded by rings of coral reefs. Each coral polyp builds a limestone skeleton that it can hide or rest in. As the colony grows, new coral build upon the skeletons of dead coral. The

result is a rock-like reef that surrounds a lagoon and island. The Northwestern Hawaiian Islands are made up of many ephemeral sand bars and nine islands surrounded by millions of acres of coral reefs (About the Area, 2006). The largest of these are Midway, Nihoa, Layasan Island, and Lisianski Island. According to Olson (2004), the tiny islands and extensive reefs begin 200 miles from Niihau and stretch for 1,800 miles. Their ages vary from seven million years old (Nihoa) to thirty million years old (Kure Atoll).

In this area of the ocean, twenty-nine degrees of latitude is as far north as coral can grow fast enough to keep up with the natural subsidence of old atolls. The Kure Atoll is at twenty-eight degrees north latitude, and as the Pacific Plate drags it to the northwest, the island will sink and meet the fate of former islands even farther north. Ranging from thirty to seventy million years old, the Emperor Chain of seamounts dots the Pacific floor all the way to the Russian coast (Camp, 2006). Any last vestiges of the islands created by the Hawaiian hotspot are at last erased as the Pacific plate is subducted under the Aleutian Islands.

The Aleutian Islands support life similar to that of mainland Alaska. The contrast between the biota of the Hawaiian Islands and the Aleutian Islands is the difference between oceanic and continental islands. At some point, a continental island was connected to a larger landmass. Either plate tectonics ripped the island from its continental moorings or a change in sea level drowned its land bridge (Quammen, 1956, p. 53). An oceanic island is very different. Life there must start from scratch as there are no preexisting ecosystems of plants and animals. In order for anything to reach an oceanic island, it must be seafaring, seaworthy, or lucky. Had Hawaii been a continental island like the Aleutian Islands, pioneering mosses would have been replaced by native grasses and sedges from Alaska. Instead, Hawaii developed flora brought by the wind, the sea, and the birds of distant continents.

The algae, lichens, ferns, and mosses that initially came to Hawaii made the moon-like volcanic landscape very attractive real-estate for a large group of plant species, the angiosperms. These are the flowering plants that produce nuts, grains, seeds, and fruits. Sea birds brought stowaway seeds and grains stuck on their feathers and feet. Nuts, beans, and coconuts drifted in the Pacific for months before being washed ashore. In the tropics, during the wet season, rivers undercut their banks sending intact pieces of forest, held together by their root systems, downstream (Sparks, 1976, p. 76). These rafts of floating vegetation are presumably the vectors for not only plants but also for the land snails, spiders, and insects that reached Hawaii.

The invading angiosperms soon inhabited environments influenced by the great variability in the local climate. During the wet season

from October to April, winds from the west develop into cyclones that bring the heaviest rainfall to the islands (Price, 2006). For most of the year, there is a nearly constant wind from the northeast, and the windward sides of the islands experience orographic rainfall: the northeasterlies make landfall, rise up the volcanic slopes, and cool, generating precipitation. The mountainous windward slopes of all the larger islands are known for tropical rainforest, while the leeward slopes, lying in what is called a rain shadow, are home to dry savannas and woodlands. Within a relatively short time, 300 species of plants, 400 species of insects, and a small number of birds colonized the islands (Olson, 2004, p. 16). There were few if any predators for many of the species. Birds took to nesting on the ground and lost the ability to fly, while insects without wings evolved. There was little competition, and food was relatively abundant. Best of all, there were many unoccupied environmental niches on the islands.

The ancestral Hawaiian plants, insects, and birds underwent adaptive radiation, a process in which a single species quickly exploits different environments and evolves into several separate species. On a continental island, the niches are already occupied by other organisms well adapted to their environment. On Hawaii, a type of finch developed into at least fifty-seven different species of birds (Olson, 2004, p. 16). These birds, called honeycreepers, became adapted to eat seeds, insects, and nectar. A species of Drosophila fruit fly evolved into 800 distinct species (p. 20).

Not only finches and flies diversified. The original colonists became at least 10,000 species of insects and 1,700 species of plants (Olson, 2004, p. 20). The islands came to be home to 1,300 different species of land snails (Loope, 2006). 140 species of birds were found on Hawaii and nowhere else (Youth, 2006). The islands' herbivores were large flightless geese, ducks, and rails, while predatory birds such as hawks and owls were at the top of the food chain. Several birds developed long curved beaks for a diet of flower nectar; others evolved large beaks to eat land snails.

The first Polynesians that came to the islands cared nothing about bird diversity. All they saw was food, and this is why they had come. The human colonization of Hawaii 1,500 years ago was an answer to overpopulation and starvation (Rose, 1980, p. 57). Native Hawaiians are descendants of refugees from the Marquesas Islands, which are part of French Polynesia today. The Marquesas are only twice the size of Rhode Island, and periodic wars turned villages into groups of seafaring refugees (Fowler, 2006). Human migrations from the Marquesas and later from Tahiti began the second major transformation of the Hawaiian Islands.

During the four-month long Hawaiian holiday of Makahiki, the entire population stopped working (Storr, 1966, p. 33). There was much cause for celebration, for Hawaiian fields and fisheries yielded great surpluses. However, introduced species and agriculture had severe environmental impacts.

The first people to set foot on the Hawaiian Islands brought plants from their Polynesian homeland; these included breadfruit, taro (a potato-like crop), ginger, and coconuts. They also brought trees for food and shelter, the kukui tree for its nuts, and the mountain apple for its fruit (Cuddihy & Stone, 1990, p. 32). All three trees, along with several weedy Asian plants, became naturalized and displaced native species. Pigs, chickens, dogs, and rats accompanied the first human colonists. Pigs are notorious for eliminating forest floor plant species, but two botanists that visited Hawaii in the early nineteenth century reported dense undergrowth and no feral pigs (p. 33). The chickens probably had little effect on native wildlife. Dogs were kept for human food consumption but hunted native ground-dwelling birds. The most devastating introduction was stowaway rats. The Polynesian rat eats mainly grasses, seeds, and fruit, but in Hawaii, it attacked lowland bird species by preying on their eggs and on nestlings (Tobin, 2006). Gnawing rats also girdled certain species of small trees and shrubs, which led to localized changes in forest species composition (Cuddihy & Stone, 1990, p. 33).

The coastal shrublands and forests were the first areas to be altered for settlements. Slash and burn techniques and, later, permanent agriculture cleared much of the lowland rainforests. Fire was used to encourage introduced plants grown for pig food or thatch. Native grasses and shrubs were not adapted to a regular burning regimen and perished. The savannas and shrublands of the leeward regions were much easier to clear than rainforest. The western, drier slopes of the larger islands were turned into intensive agricultural zones that supplied sweet potatoes, yams, and vegetables. Wetter windward valleys were converted into taro fields. By 1778, most of the trees below 3,000 feet had been cut down, and at least fifty-five species of birds had become extinct (Youth, 2006). Perhaps the most dramatic impact of native Hawaiians was the slaughter of millions of seabirds. Fossil evidence shows that migratory birds nested throughout the Hawaiian Islands in high densities before man and rat arrived, and their nutrient-rich guano fertilized the soil (Loope, 2006). Today, the remaining bastions for seabirds are the Northwestern Hawaiian Islands where fourteen million birds of eighteen species either visit or reside (NHI, 2006). When the seabirds were killed on the main islands, the loss of nutrients in the soil made some areas less hospitable to certain plant species. An example is the tree called the ohia which dominates many of Hawaii's forests. Many stands of ohia periodically experience

dieback that has been linked to this break in the local nutrient cycling (Loope, 2006).

When Cook arrived in the Hawaiian Islands in 1778, the natives were 400,000 in number (Porteus, 1945, p. 14). The Hawaiian culture didn't reach its zenith until King Kamehameha in the late 1790s, who was the first ruler to unite all of the islands under one ruler. Kamehameha desired expensive European goods and needed something other than pigs and potatoes to trade with.

In 1801, American traders found sandalwood growing on the islands, and now the third major transformation that had been begun by the fur traders intensified. Shiploads of the wood of four native sandalwood species were sent to China. In order to find the valuable wood, fires were started, and natives waited downwind to catch the scent of burning sandalwood. Several years of thorough and destructive harvesting changed the species composition of large areas of the islands.

Only the Hawaiian royalty profited from the sandalwood trade. Commoners were required to help with the gathering, but they received no compensation for their hard labor. Foreign visitors after 1810 noted that fields and animals were practically abandoned, because many people had to spend long periods of time in mountainous regions as sandalwood became rare in the lowlands (Storr, 1966, p. 50).

Visits from foreign ships increased during this time. Russians from Alaska built a fort on Kauai and controlled trade on that island from 1815 to 1817 (Bradley, 1942, p. 50). However, it was American whalers who dominated the Hawaiian economy for decades and contributed significantly to the islands' environmental degradation. Just as sandalwood was becoming rare, whaling ships began visiting Hawaiian ports. American whalers discovered the "Offshore Grounds," 1,400 miles west of Peru, in the 1790s and other important whaling grounds in the northern Pacific in the 1820s (Storr, 1966, p. 86). During the whaling era's peak in the 1840s, hundreds of ships visited the islands each year. Firewood was urgently needed. Every ship needed great quantities of wood to fuel the boilers that separated the whale oil from the blubber. Thousands of acres of forest across the Hawaiian Islands were chopped down to sell to whalers.

More rats arrived with the whaling ships. Brown and black rats are larger and more aggressive than Polynesian rats, and they preyed heavily on native bird and insect populations. In 1827, a whaling ship emptied its old water barrels into a Maui stream (Youth 2006). Days later, natives were bitten by the islands' first mosquitoes. At least a dozen species of birds became extinct, because the new pests carried avian malaria and bird pox, to which the native species had no immunity. Several epidemics reduced the native Hawaiian population. The first was

brought by Captain Cook. Later epidemics of bubonic plague, cholera, small pox, influenza, whooping cough, and measles took their toll on the islands' population. By 1823, a missionary census counted only 142,000 native Hawaiians, and in 1850 there were only 70,000 (Storr, 1966, p. 172). By the 1860s, many villages had been abandoned.

The decline in the native Hawaiian population actually coincided with the growth in export agriculture. Many different crops had been brought to the islands by a Spaniard named Francisco de Paula Marin, who arrived in Honolulu from Mexican California in the early 1790s (Marin, 2007). Marin kept up a correspondence with ranchers and botanist-monks in California, while ship captains brought him plants from all over the world (Storr, 1966, p. 106). He experimented with pineapple, wheat, tobacco, and sugarcane, among other crops.

Many other agricultural projects by American planters, Hawaiian royalty, missionaries, and New England businessmen were undertaken including potatoes, oranges, and wheat, which were either sold to whalers or shipped to San Francisco to feed Sierra Nevada gold miners (Storr, 1966, p. 225). Coffee was introduced in the early nineteenth century. It grew well in a few places on the drier, leeward slopes of the large islands, but cultivation remained quite limited. During the Civil War, Hawaiian cotton was exported to New England textile mills. The soft hairs of Hawaii's tree ferns were used in pillows and mattresses. Between 1860 and 1864, 600,000 pounds were exported each year (Cuddihy & Stone, 1990, p. 39). Often the entire tree fern was destroyed in the harvesting. Native Hawaiian taro patches were replaced with rice. The pineapple wasn't grown for export until the end of the nineteenth century, but by the 1950s, thousands of acres, including the entire island of Lanai, were in pineapples (p. 42).

A variety of sugar cane, possibly introduced from the Marquesas, grew wild in Hawaii, but no sugar could be produced without a mill. The first successful mill exported four tons of sugar from Kauai in 1836 (Storr, 1966, p. 233). Sugar cultivation increased exponentially after that. By 1970, sugar cane covered 250,000 acres, and over one million tons were produced (Cuddihy & Stone, 1990, p. 42).

The value of sugar and pineapples to the Hawaiian economy was immense but had serious consequences. Pineapple and sugar plantations pushed agriculture into marginal areas that required irrigation and fertilizers. Huge amounts of firewood were needed to fuel the boilers that processed the sugar. Railroads were laid down to move cane and firewood from the fields to the mills. Planters realized they were harvesting the wood faster than it could grow and planted thousands of acres of fast-growing, nonnative trees.

Sugar refineries were not the sole reason behind the disappear-

ance of much of Hawaii's forest cover. The forests of southern Hawaii were cut down to make railroad ties for the continental United States, and 30,000 acres were logged for this purpose up until 1913. For years, state planners envisioned commercial timber plantations that would rival the success of the islands' sugar cane. Since 1950, state initiatives and private interests have cleared and planted thousands of acres, but high milling costs have kept these enterprises from being successful. However, small-scale logging on former ranchlands is increasingly profitable. Today, ranchers export small quantities of wood from native and introduced species to Southeast Asia and California (Cuddihy & Stone, 1990, p. 47). The dormant sandalwood trade was renewed by ranchers in the 1980s; a single shipment in 1988 was worth one million dollars (p. 58).

In the past 200 years, 1,813 plant species have become naturalized in the Hawaiian Islands (Wester, 1992, p. 105). The exotic species come from every continent except Antarctica. Many are escapees from agricultural fields and gardens. Several introduced plant species are stimulated by the fires set by plantation workers and ranchers. After a few anthropogenic fires, highly flammable nonnative grasses predominate and increase the threat of wildfires (Tunison, 1993, p. 376).

Many of the exotic plant species that threaten native ecosystems are spread by introduced animals and birds. At least 160 species of birds have been introduced, and they help to spread invasive plants by favoring their fruit and seeds over those of native plants (Youth, 2006). Whalers and traders intentionally let pigs loose all over the islands, and the soil of thousands of acres of windward rainforest has been altered by rooting wild pigs. Hawaiian plants had evolved in an environment without large grazers and lost their thorns and toxicity. In fact, a field guide to the poisonous plants of Hawaii reveals only one native species; the rest are introduced (Arnold, 1968, p. 27). When cattle were brought to the islands in 1792, they ate their way through native forests and trampled large areas (Morris & Love, 1992, p. xxi). Invasive plant species grew well in the disturbed soil and quickly outgrew native species. The firetree is probably the worst menace, and its dense stands infest 54,000 acres today (Whitaker & Gardner, 1993, p. 226).

Today, pineapple and sugar cane cultivation is declining. Tourism is now the largest contributor to the local economy and to habitat fragmentation. Agricultural land and pasture next to urban areas are more valuable as housing developments and resorts. An old joke is that the construction crane is the new state bird, but urbanization was under way by the 1940s. While the island of Hawaii has seen the fastest growth in recent years, Oahu experienced the worst growing pains. Honolulu has seventy-two percent of the state's population, and as the city grew, its local wetlands were filled in (Economic and Research Information, 2007).

Up until the 1970s, the metropolis's raw sewage was dumped only four miles from Waikiki Beach (Gray, 1972, p. 115). A recent survey showed that several insects endemic to southern Oahu have become extinct due to the intense development of the past thirty years (Loope, 2006). The exact number of insects endemic to Hawaii will never be known because predation by introduced species, anthropogenic fires, and agriculture probably drove some into extinction before Captain Cook ever reached the islands. Scientists do know that seventy birds are extinct and thirty-one more are endangered (Loope, 2006). Almost 900 species or seventy-one percent of Hawaii's native land snails are extinct. At least one bird, the Lanai Hookbill, disappeared after its main food source, an endemic land snail, became extinct (Lanai Hookbill, 2006).

However, the greatest changes to the islands will come from global warming. As greenhouse gases trap solar radiation and increase global temperatures, the ice of Greenland and Antarctica will melt, which in turn will raise global sea levels. If sea level rise occurs over a short time period, the coral reefs of Hawaii, whose biodiversity is comparable to that of tropical rainforests, will die in water too deep for enough sunlight to penetrate for photosynthesis. In addition, huge quantities of carbon are being absorbed into the oceans and the pH of sea water is decreasing. A more acidic ocean will weaken or possibly dissolve the calcium carbonate structures not only of coral, but of shellfish and plankton. Finally, the rising temperatures will enable disease-bearing mosquitoes to spread into the remaining upland forests on Maui and Hawaii, which are the last stand for several native Hawaiian birds.

The list of environmental alterations is long and the net result has been a trend towards extinction. Although the native Hawaiian population has rebounded from years of nineteenth-century epidemics, native communities face new catastrophes looming on the horizon. A thorough understanding of Hawaii's environmental history is only half of what is needed to preserve what is left. We need to act to prevent global warming, habitat fragmentation, and extinction.

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Back to the Garden

Introduction

We are stardust, we are golden
We are billion year old carbon
And we got to get ourselves back to the garden

So sing Crosby, Stills, Nash, and Young to Joni Mitchell's words from the song "Woodstock" (Mitchell). Assigning to the concept of "garden" a deeper concept of a symbiotic relationship with nature, these words echo a message present in Henry David Thoreau's *Walden* which Tremains relevant today. Although the environment is in a state of decline stemming, in part, from the Christian-based view that separates man from nature, and current policies and practices do little to alleviate environmental damage, Thoreau suggests an alternative, environmentally-friendly view where simplicity replaces excess luxury and humans are subject to natural systems. The urban environmental paradox is a significant obstacle to the implementation of Thoreau's idea. Using the urban environmental problems that result from vehicular commuting traffic as an example of the urban environmental paradox[1], I argue that this paradox exists because the current hyper-individualistic viewpoint, which trends toward ethical egoism, is a significant obstacle to the implementation of readily-available solutions, and note that the holistic value in Aldo Leopold's land ethic suggests beneficial guidelines to adopt. Recognizing the arguments that have been raised against holism, I also consider how a holistic environmental ethical frame might withstand the criticisms and remain viable and useful.

Part One: Back to the Garden

There remains little question today that the environment is in danger. "Every living ecosystem is in a state of decline and the rate of decline is increasing" says a widely varied group of monitors, such as the United Nations Committee on the Environment, the Smithsonian, and even the World Bank (Sheppard). Though the media prefers to report a preponderance of conflict on this issue, the actual research performed by Naomi Oreskes in 2003 shows that among peer-reviewed journal submissions,

the consensus position states that "rapid climate change by human-caused inputs has been causing and will likely continue to cause warming" (Oreskes 16986). It seems reasonable to suggest that environmental degradation and global warming are threatening the long term status of life on earth. The correlation between anthropogenic carbon dioxide (CO_2) emissions and global warming is quite clear. Although "critics of global warming are right to insist that no definitive causal connection has been established[,][,]... there is compelling evidence linking global warming with human activity" (Kaufman 317). Science explains how CO_2 emissions cause global warming even if the causal connection has not been made. Kaufman goes on to point out "it is one thing to know that A causes B, and another to know *how* A causes B. Given what is at stake with global warming, prudence would counsel not holding out until the last shred of evidence makes a causal connection between industrial activity and dangerous levels of global warming undeniable" (Kaufman 317).

Global warming is just one element of many that shows how the predominant method of interacting with nature is not sustainable. Steeped in the Christian tradition, many humans look upon nature as something which is there to be used and controlled however they desire. Walter O'Briant notes that there are two separate views of man[2] in relation to nature: "man apart from nature" and "man a part of nature" (O'Briant [Kaufman] 49). The common western paradigm maintains that humans are not a part of nature because they were created by an omniscient and omnipotent God in the image of God. God is above all creation; since humans are created in His image, they too transcend nature. "It is noteworthy here that this characterization has been made in the notions of creature, Creator, and creation," writes O'Briant, "for in our religious tradition particularly the basis for man's uniqueness has been found in relation to his Creator. The most important feature of this relation is that man was made in the image of God" (O'Briant [Kaufman] 50). Humans think because they rule the world, they can do with nature just as they please. This so-called western Christian view is what Lynn White, Jr. calls "the most anthropocentric religion the world has seen ... [its] striking story of creation [suggests that] God planned all of this explicitly for man's benefit and rule: No item in the physical creation had any purpose save to serve man's purposes" (White [Kaufman] 44). If all of creation exists only to serve human's purposes and humans are not a part of nature, nature becomes merely a resource to be exploited. Mankind's "careless attitude toward his environment has been reinforced by ... a frontier attitude – the notion that whenever our surroundings are depleted of the elements needed for our mode of life there will always be virgin territory for our expropriation and exploitation" (O'Briant [Kauf-

man] 52). Unfortunately, unsustainable practices are leaving the world with no frontiers left to exploit.

This process has not proceeded willy-nilly without any sorts of checks at all. Following the predominantly utilitarian or consequentialist ethic of John Stuart Mill (Kaufman 9), there have been regulations applied in an attempt to protect the greatest number of people. Environmental Law and a policy system for determining it have been created. Unfortunately, this system does not work perfectly.

Grounded in a complex regulatory structure designed to deal with environmental problems one at a time and pollutant by pollutant, the laws and regulations that comprise federal environmental law and serve as a template for all state environmental programs are, environmental law professor E. Donald Elliot explains, 'premised on the fiction of an omniscient center' capable of dealing with all environmental problems in a centralized and uniform manner (Shutkin 101).

While some imagination may be required to agree completely with Shutkin's analysis, it is at least interesting to note that the omniscient center at the head of the complicated bureaucracy resembles closely the omniscient God at the head of Christianity; in our relationship to nature, both appear to be problematic.

In addition to environmental law and policy, America also has an environmental movement at both the professional organizational level and at the grass roots level (Shutkin). Neither, however, has successfully overcome the problem of separation between humans and nature; nature remains "out there," apart from humans. "'If the overriding objective of environmental activism is protection of the entire environment,' Mark Dowrie writes, 'the traditional environmental movement was not more than half a movement. Limited from the start, it was almost obsessively oriented toward wilderness, public land, and natural resources conservation" (Shutkin 120). In this movement, humans are still not an integral part of nature, and nature is not an integral part of humans. "William Cronon decries environmentalists' habit of 'idealizing a distant wilderness' at the expense of the local, the everyday" (Shutkin 120). The "local" and "everyday" are the root and foundation of today's urban environment. Currently, more than half of the world's population is now living in urban environments (Sheppard).

Thoreau stated that "the same questions that disturb and puzzle and confound us have in their turn occurred to all the wise men; not one has been omitted; and each has answered them, according to his ability, by his words and his life" (Thoreau 185). A wise man himself, Thoreau addressed in *Walden* the root causes of many of the environmental questions facing our society today. "As early as the mid-nineteenth century, George Perkins Marsh and Henry David Thoreau, among others, called

for the conservation of nature, despairing, as Marsh did, that 'Man has too long forgotten that the earth was given to him for usufruct alone, not for consumption, still less for profligate waste'" (Shutkin 91). Thoreau was not a subscriber to the "man apart from nature" view; he is the epitome of the "man a part of nature" attitude. As such, Thoreau provides the foundation for a very different relationship with nature. Albert Einstein stated: "The problems that exist in the world today cannot be solved by the level of thinking that created them." Similarly, it seems foolish to think that today's problems can be solved without stepping out of the box. Clearly, the current views of nature are not working. "More science and more technology are not going to get us out of the present ecologic crisis until we find a new religion, or rethink the old one," states White (White [Kaufman] 47). Using the same methodology over and over and expecting a different result is truly insane. Thoreau's experiment in *Walden* provides the map for an out-of-the box method, for Thoreau was definitely not an in-the-box philosopher. His view of nature is nothing like the current popular view of today.

"I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach," writes Thoreau (172). While at Walden Pond, Thoreau lived very simply, choosing to eschew many of the assumed "necessities" of contemporary life. He found they were not at all necessary. "Most of the luxuries, and many of the so-called comforts of life, are not only not indispensable, but positive hinderances [*sic*] to the elevation of mankind" (Thoreau 115). Cornell University economist Robert Frank would heartily agree with Thoreau today. "[Frank] argues in *Luxury Fever* that our obsession with high-end consumer items is not making us happy" (Kaufman 432). This very obsession with consumer luxury items is one of the primary factors harming our environment today. Items such as running shoes, blue jeans, and carpets take a significant toll on the environment through exploitation of natural resources, and human labor, and they produce significant quantities of air, water, and environmental pollution, in addition to other industrial waste ("Life-cycle Studies"). Thoreau proved that it was more advantageous to avoid unnecessary luxuries. "I wish to show at what a sacrifice this advantage is at present obtained, and to suggest that we may possibly so live as to secure all the advantage without suffering any of the disadvantage" (Thoreau 128).

Living simply without obligation to unnecessary luxuries was indeed an advantage that allowed Thoreau the opportunity to focus his attention elsewhere. "By deliberately reducing his material wants, [Thoreau] found that he could live on very little and thereby devote the bulk of his time striving to comprehend what nature has to teach. *Teach* is the right word. Thoreau views nature as a source of wisdom" (Kaufman

378). Instead of nature being an object kicked around at the every whim of any person, nature is to Thoreau an important source of information. Thoreau learned to rely on a symbiotic relationship with nature for survival, which required an alteration in typical, everyday city-style, apart-from-nature thinking. Similarly, faced with the idea of losing the world, we, too should make a shift in our thinking. Denying that we are a part of nature and nature is a part of us is the source of our problem. Thoreau's message in *Walden* serves as an example of how one can avoid this problematic style of thought. It is easy to give a cursory glance to *Walden* and assume that the idea is for everyone to grab a small handful of spending money and retreat from the city to his or her own remote Walden Pond, build a small shack, and live simply like Thoreau did. That, however, is not Thoreau's message, nor would it be environmentally wise. Unlike John Muir-influenced Murray Bookchin suggests, the Confederal system of eco-community would appear to lead to one giant urban-esque landscape. Most humans are naturally social creatures. It is important to note that Thoreau was only a short distance from Concord, that he regularly walked to town and maintained continued interaction with other people, and that it was during this time that he spent his famous night in jail in protest of taxes to a government whose policies he did not support. He writes: "Every day or two I strolled to the village to hear some of the gossip which is incessantly going on there, circulating from mouth to mouth, or from newspaper to newspaper, and which, taken in homeopathic doses, was really as refreshing in its way as the rustle of leaves and the peeping of frogs" (Thoreau 228). Through simile, Thoreau again equates human society with nature.

Kaufman notes that "reading Thoreau often brings about an inner transformation that makes it impossible to participate fully in our market-driven, consumer-oriented society in quite the same way ... we can continue to function within it, but henceforth at some critical distance" (Kaufman 379). That critical distance is the first step in beginning to apply new solutions. Thoreau's symbiotic relationship between humans and nature suggests a simple, sustainable lifestyle; as such, it remains a relevant, significant, and foundational suggestion for the alteration of current values that can reduce accelerating ecological decline.

Part Two: Root, Root, Root for the Home Team?

The adoption of Thoreau's relationship with nature faces a significant obstacle: the paradox of urban environmentalism. In his forthcoming book, *The Paradox of Urban Environmentalism*, James Sheppard identifies this paradox:

Despite awareness that the values and policies adopted in urban environments contribute to environmental trends that threaten the ability of urban environments to function well as habitats for multiple species,

and despite the fact that the knowledge needed to reverse these trends exists, efforts to arrest these trends continue to enjoy only halting success (Sheppard, forthcoming).

The urban environmental problems that result from vehicular commuting traffic are an example of the urban environmental paradox. Automobile pollution, especially in urban environments, is a fact. Pollution mitigation devices such as catalytic converters have helped to reduce vehicular emissions. However, the quantity of people driving single-occupancy cars has increased rapidly enough to offset these technical solutions. Add to this that many people want the newest, coolest, and often the most environmentally detrimental vehicle. Aldo Leopold metaphorically anticipated this type of behavior years ago:

How like fish we are: ready, nay eager, to seize upon whatever new thing some wind of circumstance shakes down upon the river of time! And how we rue our haste, finding the gilded morsel to contain a hook (Leopold 42).

Leopold's colorful suggestion aside, the reliance on the individual vehicle for commuting has also resulted in the destruction of many urban ecosystems in the expansion of roadways to accommodate the ever-increasing number of vehicles on the road. Fortunately, public transportation, carpooling, walking, and hybrid vehicles are all well-known options that reduce the problems of single-occupancy vehicles. Though the overall benefits of these transportation alternates are clear, implementation—especially in Kansas City—does not happen. This is clearly an example of the paradox of urban environmentalism: the problems are known, the solutions are known, but these solutions have little success at being implemented (Sheppard).

The prime obstacle to implementing these known, available, and obvious solutions rests in the preponderance of hyper-individualism, which is currently highly valued in our society. When questioned, many people respond that public transportation, carpooling, or walking is not convenient, that air pollution isn't their problem, or—even worse—that they are not aware that a problem exists. Ignorance of the problem functions as an incentive to avoid action; if people refuse to acknowledge the problem, they do not have to act. The other common responses—"it's inconvenient, I can't do it" and "it's not my problem"—suggest an individualistic trend that is heading toward psychological egoism, which Tom Beauchamp and Norman Bowie identify as "the view that everyone is always motivated to act in his or her own perceived self interest (Beauchamp and Bowie 16). It is not that the individuals really *can't* use an existing solution; they merely *choose* not to. Bryan Norton would identify this behavior as an example of a *felt preference*, or "[a] desire or need of a human individual that can at least temporarily be sated by some spe-

cific experience" (Norton [Kaufman] 328). This type of thinking follows right in line with what Richard Sylvan defines as human chauvinism, where "humans, or people, come first and everything else a bad last" (Sylvan [Kaufman] 96). Peter Singer calls it an example of speciesism, which "is a prejudice or attitude of bias in favor of the interests of members of one's own species and against those members of other species" (Singer [Kaufman] 151). Vehicular emissions, however, have exceeded even speciesism. The negative impacts of air pollution are adversely affecting other humans—members of our own species—as well. Our behavior is perverse, like the diabetic who simply must eat that chocolate chip cookie despite drastic medical results. We pack ourselves, as veteran rock group The Police sing, "like lemmings into shiny metal boxes" and join the "suicidal race" commuting to and fro each day.

Another reason that existing solutions are enjoying only minor success is that the media and advertisers frequently bombard us with the message that hyper-individualistic behavior is acceptable and even necessary. This approaches ethical egoism, which suggests that "one *ought* always to act on the basis of one's own best interest" (Beauchamp and Bowie 18). Ethical egoism is a dangerous place to be. Thomas Hobbes evaluated it this way:

Imagine a world with limited resources, where persons are approximately equal in their ability to harm one another, and yet, everyone acts exclusively in his or her own interest... everyone would be at everyone else's throat; such a 'state of nature' would be plagued by anxiety, violence, and constant danger" (Beauchamp and Bowie 18-19).

This description sounds very similar to how the media portrays many urban environments. The stability of this environment would be tenuous at best. J. Baird Callicott agrees:

A society, indeed, is particularly vulnerable to disintegration when its members become preoccupied totally with their own particular interest, and ignore those distinct and independent interests of the community as a whole (Sober [Kaufman] 305).

Aldo Leopold's holistic land ethic, however, offers a different method of thought and action from hyper-individualism which might help to resolve the urban environmental paradox. His view considers the community as a whole, extending moral consideration to all ecosystems. It makes sense: anything that damages one part, damages the whole. "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise," reads Leopold's maxim (262). The holistic method has a strong foundation in the philosophy of David Hume, which suggests that not every moral sentiment derives from individualistic principles, but instead there are "inborn moral sentiments which have society as their natural object"

(Callicott [Kaufman] 274). Hume suggests that "[we] adopt a more publick [*sic*] affection and allow that the interests of society are not... entirely indifferent to us" (*ibid*.). Leopold extends the definition of society to include the "biotic community" and shows that it deserves moral consideration because it is also an object of "publick affection which all normal human beings have inherited from a long line of ancestral social primates" (*ibid*.). He establishes six important environmental management guidelines:: One should exercise carefulness when tinkering with nature. One should avoid trigger itch when intervening. One should assess possible consequences of actions whenever possible. People should act as member-managers, not as conquerors. Pointing-the-finger blame should be surpassed by mutual accountability and responsibility. Finally, people should connect the need to act differently with the need to think differently (Sheppard).

Moving to Leopold's holistic way of thinking may seem like a big step, but using this maxim as a guide to dealing with our obsession with single-occupant vehicles reduces the problem of the urban environmental paradox. Carpooling, using public transportation, driving a hybrid vehicle, or walking whenever possible are all existing solutions. Each is very careful tinkering within an existent system. None fail the trigger-itch test; we've known these options for a long time. Possible consequences have been (or can be) evaluated when making a choice. Everyone is an equal member and manager, and all equally share responsibility and accountability. Choosing these logical options shows a form of thinking differently than most people are thinking currently about commuting; all apply consideration to the whole ecosystem, which is vitally important to establishing mutual responsibility and accountability:

There is as yet no social stigma in the possession of a gullied farm, a wrecked forest, or a polluted stream, provided the dividends suffice to send the youngsters to college. Whatever ails the land, the government will fix it. I think we have here the root of the problem. What conservation education must build is an ethical underpinning for land economics and a universal curiosity to understand the land mechanism. Conservation may then follow (Leopold 202).

Adopting a more holistic, all-inclusive view already works on urban environmental problems, as William Shutkin shows with the example of the Dudley Street Neighborhood Initiative (DSNI) in Roxbury, a small urban community near downtown Boston. Faced with hazardous trash dumps, toxic brownfields, and numerous other problems stemming from traditional urban renewal, white-flight, and abandonment issues (Shutkin 143-154), what made Roxbury's struggle successful was the holistic, all encompassing view:

Out of extraordinary adversity spanning several decades, the Dudley

neighborhood has been able to pull together to engage in comprehensive community planning, resulting in a sophisticated, innovative community-building strategy. With the full participation of neighborhood residents, businesses, community organizations, and local foundations, DSNI arrived at the UAS [Urban Agricultural Strategy] slowly and deliberately, improving its civic capacity for planning and problem solving along the way, creating what Greg Watson calls 'civic alchemy' – the yeasty, creative mix that comes from an engaged citizenry and produces often unpredictable, though always beneficial, results (Shutkin 162).

The key components here are "comprehensive community planning," "full participation," and "slow and deliberate" work toward a goal. Each is an important point in Leopold's environmental management guidelines. The resulting "civic alchemy" is the crowning achievement that shows the great benefit of Leopold's method: it works.

The holistic view works well from an ecological standpoint; it is a very different form of thinking, however, compared to merely an individualistic view. Harley Cahen provides the most astute argument against Leopold: "ecosystems cannot be morally considerable *because* they do not have interests" (Cahen [Kaufman] 289). They have no interests because they have no specific goals. Cahen asserts that the idea that members of an ecosystem "are cooperating to restore equilibrium" is "surely imaginable… each creature might instead be 'doing its own thing,' with the fortunate but incidental result that the ecosystem remains stable. *If this is correct, then we are dealing with a behavioral by-product, not a systemic goal*" (Cahen [Kaufman] 294, emphasis original). As an illustration, Cahen cites an example from George Williams involving a Martian biologist observing earthlings' behavior in a burning, crowded theatre. Cahen writes: "if the crowd clogs the exits in spite of strenuous crowd control efforts," the Martian could report that the crowd achieved the goal of self destruction by clogging the exits (Cahen [Kaufman] 294). The Martian would have concluded incorrectly. Obviously, self destruction is not the goal of the crowd; it is an unintended by-product of a rush for individual self preservation (*ibid.*). Likewise, the "good" or "bad" that we notice in ecological systems might be unintended by-products, not actual goals. Cahen implies that even if all individual members of an ecosystem possess goals, stating that the ecosystem itself has a goal commits the fallacy of composition: assuming that because the parts have individual properties, the whole will, too (Kaufman 33).

Cahen's argument is compelling, but I'll offer two examples that show we already accept the idea that moral consideration should be extended to collective systems. Consider a baseball team and its long-term fans. For my argument, the baseball team is analogous to an ecosystem and the fans are analogous to society in general. Like "eco-

system," the collective noun "team" is a concept we create to describe the players and allow them to play this game together. Each of the players may have an individual goal of winning the game, doing his or her best, or entertaining the spectators. Extrapolating those goals to the collective term "team," however, commits the fallacy of composition. The various individual actions of the players result in whether or not the team wins, but true fans support the team either way. Though over time, the players may all change, the team continues to exist and many fans continue to root for the home team. In making the choice to support a baseball team over time, fans extend moral considerability to the team as a whole. The choice to support (or not support) the team—to value it, defend it against put downs and ridicule, and hold it in high esteem—is a moral consideration.

The corporation is another example. It is a group of individuals working at their own individual tasks. At the most simplistic level, the CEO decides who should be hired and fired; the production workers add thingys to what-cha-ma-call-its and doodads to gizmos, creating a product. Individually, at the least, each person is working to complete his or her task and earn a paycheck. The by-product is that the corporation makes a viable "thneed"—as Dr. Suess (*The Lorax*,) would call it—and thus a profit. But the corporation itself is not a real thing:

Chief Justice Marshall, in *Dartmouth College v. Woodward* in 1819 gave the corporation its classical formulation: 'A corporation is an artificial being, invisible, intangible, and existing only in contemplation of law. Being the mere creature of law, it possesses only those properties which the character of creation confers upon it, either expressly, or as incidental to its very existence. These are such as are supposed best calculated to effect the object for which it was created' (DeGeorge [Beuchamp and Bowie] 58).

While it can be argued that a corporation has an overall goal, the important note is that the corporation is artificial. Despite that, history shows that moral consideration has certainly been extended to corporations. Over the past 150 years, Supreme Court case "findings" have established that the rights set forth in the First, Fourth, Fifth, and Fourteenth Amendments to the Constitution apply to corporations just as to individuals.[3] Cahen states: "I find it best to regard talk of the rights of nonhumans as an enthusiastic way of asserting moral considerability" (Cahen [Kaufman] 289). Clearly, the corporation is a non-living collective system; clearly, the Court has extended to this collective a series of rights. Though there is a difference between legal and moral rights, "moral rights… exist independently of and form a basis for criticizing or justifying legal rights" (Beauchamp and Bowie 46). At the very least, in establishing its legal rights, moral consideration is extended to the corpo-

ration.

We are familiar with extending moral considerability—even legal rights—to baseball teams and corporations. Though it makes sense, to suggest that we *ought* to extend moral considerability to ecosystems merely because we extend it to baseball teams and corporations unfortunately commits David Hume's *is-ought* fallacy: just because something *is*, it therefore *ought* to be that way. As such, Cahen's critique remains a significant obstacle to fully accepting the holistic argument on its own, despite its obvious benefits and apparent appeal; an alternate way must exist.

Bryan Norton's "weak anthropocentrism" (Norton [Kaufman] 326-337) provides just such an alternate. We do not live in a world of absolutes. Where hyper-individualism is one extreme and holism is the other, weak anthropocentrism might be the "mean between the extremes." Recall that Norton defines a *felt preference* as a human need or desire easily sated by a given experience. It involves only thinking about oneself. Weak anthropocentrism, on the other hand, includes *considered preferences*, which can "only be adopted after a person has rationally accepted an entire world view, and further, has succeeded in altering his felt preferences so that they are consonant with that world view" (Norton [Kaufman] 328). In other words, one alters felt preferences after learning about and giving careful consideration to the consequences they might entail. It is like smart shopping: rather than buying the biggest and most expensive lawnmower on the market, the smart shopper would take in to consideration not only his desire for a shiny machine, but also the potential effect that machine might have on the ecosystem as a whole. The potential consequences of the large, gas-powered machine are damages to the environment in numerous ways (gasoline dependence, air pollution, grass clippings, etc.). Knowing that, the smart shopper, then, might purchase an electric push mower that mulches the grass instead. The even smarter shopper might plant native buffalo grass, which requires little or no extra water, grows only six inches tall, and never needs mowing. In Norton's view, nature functions as a teacher; once one learns how ecosystems function, one should consider that knowledge when making decisions. Leopold would likely agree. According to Leopold, learning about the environment shows that "if the land mechanism as a whole is good, then every part is good, whether we understand it or not" (Leopold 190). Leopold's land ethic maintains room for the individual. After all, humans are also an important part of nature (Thoreau, *Walden*). J. Baird Callicott points out that Leopold's "land ethic, thus, has a holistic as well as an individualistic cast" (Callicott [Kaufman] 273). Leopold self defines:

In short, a land ethic changes the role of *Homo sapiens* from conqueror

of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such (Leopold 240).

The most beneficial features of both weak anthropocentrism and Leopold's holistic land ethic are that each (or even better, a combination of both) involves actually taking some sort of action. American philosopher John Dewey said: "Philosophy recovers itself when it ceases to be a device for dealing with the problems of philosophers and becomes a method for dealing with the problems of man" (Dewey 65). Cahen's argument leaves us stuck in deliberation about whether or not moral considerability can be given to ecosystems, failing Dewey's call for a method, and resulting in no action taking place; the paradox continues. Leopold offers environmental management guidelines for action. Norton offers a method that checks actions that result merely from felt preferences and encourages the performance of actions that result from considered preferences instead. These actions are key to avoiding the paradox of urban environmentalism because they account for step three: actually implementing the known and available solutions.

Conclusion

The thinking processes that guide our interactions with the environment are flawed – they result in significant stress on natural systems, which leads to serious and accelerating ecological decline. The Christian-based view that man is somehow apart from nature is problematic. Thoreau offers a different relationship that embraces nature as the omniscient teacher and model of variety and sustainability. The message of *Walden* remains a significant and relevant suggestion to alter current values. The problem of the urban environmental paradox, however, is a substantial obstacle to doing so. It has its root in the hyper-individualistic nature of our society. We already know the problems and their solutions; we're just too self-centered to do anything about it. Aldo Leopold offers the land ethic—a holistic approach—with managerial guidelines as a solution. Even if the idea that ecosystems deserve no moral consideration is appealing, the more holistic, weak-anthropocentric approach still eliminates the problem of hyper-individualism and psychological and ethical egoism. Because they result in action, both Leopold's and Norton's methods are a viable and useful environmental ethical frame. With the urban environmental challenge at hand, both lead to the use of hybrid vehicles, public transportation, carpooling, and even walking when possible. As such, they are an important rethinking that will allow application and implementation of existing and readily available urban environmental solutions. Following this guide, we might recognize, as Crosby, Stills, Nash, and Young intone, that indeed we can "get ourselves back to the garden."

(Endnotes)

1 The author is indebted to Dana Collins (California State University-Fullerton, Department of Sociology) and Shannon Jackson (UMKC, Department of Sociology) for an introduction to environmental sociology; information from their lectures and other conversations are foundational to the research of this document; and to James Sheppard (UMKC, Department of Philosophy) for numerous conversations and discussions about ethics, philosophy, the current state of the environment, and helpful comments during the drafting of this paper.

2 By "man" O'Briant and White actually refer to all humans, women and men. I use the term human synonymously.

3 A by-no-means exhaustive list of Supreme Court cases showing this includes: *First National Bank of Boston v. Bellotti*, 435 U.S. 765 (1978), First Amendment; *Hale v. Henkel*, 201 U.S. 43 (1906), Fourth Amendment; *Noble v. Union River Logging R. Co.*, 147 U.S. 165 (1893), Fifth Amendment, and *Santa Clara County v. Southern Pacific Railroad Company*, 118 U.S. 394 (1886) and *Minneapolis & St. Louis Railroad Company v. Beckwith*, 129 U.S. 26 (1889), Fourteenth Amendment. Found at http://www.poclad.org/ModelLegalBrief.cfm#p3b1 , including relevant links to each case, retrieved online 6/24/06.

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James J. Ramirez

Gardens in the Sky

One of the main contributors to the problem of global climate change in urban areas is a phenomenon known as the "urban heat island" effect. Densely populated areas comprised of more concrete than flora absorb and retain heat to such a degree that they raise the temperature of the surrounding area significantly. Furthermore, concrete structures adversely affect the nesting patterns of birds and insect life and, being that they retain heat, require more energy to sufficiently cool the internal climate of these structures. Hence, this is a problem that takes a toll not only on the external climate but the internal climate as well. However, there is a solution to this problem that offers many positive benefits to humans as well as plant and animal life.

What the University of Missouri-Kansas City needs is an urban roof garden initiative. There are many flat roofs on campus that contribute to the problem created by the "urban heat island" that could be turned into elevated green spaces. The benefits of sustaining a roof garden are many. Allow me to briefly examine a few of the advantages of these green-topped structures. First, there is the direct impact these spaces have on combating the aforementioned phenomenon by insulating the roofs of buildings so they are not able to absorb and retain heat to such a degree that it affects the surrounding area. In fact, this type of structure actually cools and cleans the surrounding air. Of course, the added green insulation also takes care of the problem of expending more energy to cool the interior of a building. Since the building does not absorb and retain as much heat it is naturally cooler than a building with a bare concrete roof. Roof gardens also provide nesting places for birds and insects while at the same time minimizing runoff that contributes to flash flooding (a problem that the Plaza, UMKC campus and the surrounding area is very familiar with). There is also an aesthetic value not to be overlooked. On a pleasant day, a roof garden would make an ideal place for students and faculty to peacefully study and commune with each other and view the skyline of our beautiful city all while above the bustle of activity taking place below.

I envision this as a project that we as a community of learners could undertake together. Students and faculty in the Department of Architecture, Urban Planning and Design could confront the spatial and logistical arrangement of the roof garden. Students and faculty in the Environmental Science and Studies Departments would be perfect for selecting and caring for the native plants that would furnish the roof. This could be an ideal venture for a student or group of students to work

on as a senior or graduate level project. Furthermore, we would not be the only institution in the city to begin implementing urban roof gardens. Black and Veatch, in conjunction with the Mayor's office, already have a roof garden initiative in the works for the parking structure of their Ward Parkway offices.

There would no doubt be many structural, fiscal and liability issues that would need to be work out to make this a successful and feasible endeavor but I have faith that the citizens of this university and community could overcome these obstacles through a collective will to do something good for their environment. This would be a project that I believe may people would latch onto, take pride in and see the benefits of and would stand as a lasting symbol of the ingenuity, conscientious design, civic awareness and environmental progress of today's students and faculty.

Emily Monroe

La Promesse de Velo'v: Creative Transportation

With its half-million inhabitants, discouraging taxes on all things automotive, and a public transit union that seems to understand the occasional strike as a happy extension to their annual six weeks of vacation time, the agglomeration of Lyon, France, made a giant step in personal transportation in the summer of 2005 by introducing Veol'v, a public bicycle system. Lyonnais pedestrians, after having registered with the city as a Velo'v user and made a deposit, may use their credit card to unlock a bike from a special electronic rack. They may ride the bicycle as long as the care to: the first twenty minutes are free, and beyond that there is an hourly charge. They may lock the bicycle back into any of Lyon's nearly two hundred Velo'v stations throughout the city. The website where this information is available (http://www.belov.grandlyon.com/) touts the service as "simple and practical for all your short trips."

IN evaluating this system's practicality in Kansas City, two issues immediately come to mind. First, Kansas City's unfortunate history of unplanned sprawl has rendered our destinations much farther from one another than perhaps similar errands would constitute in dense, medieval Lyon. Second, as a result of this phenomenon, most people in Kansas City use cars as their primary means of transport, whereas many more people utilize the efficient and mostly reliable public transportation in Lyon. One wonders whether Kansas Citians would be as likely to embrace a public bike system, which has been particularly successful in Lyon.

I contend that a carefully designed plan for stations and bicycles, as well as a persuasive introductory campaign, could make bikes a viable solution in Kansas City. Our program would have to be modeled after the

sentiment of a "simple and practical" solution for "short trips." A preliminary system in Kansas City would be most effective if based around the universities. This implies a population that is already in a pedestrian position. Were we to place a station at the new U Center at UMKC, at a central location at Rockhurst, and at a similar part of the Art Institute, students could greatly benefit from their accessibility and cost-effectiveness, especially in a future in which the costs of personal vehicles is less and less certain. It would make sense also to place stations at nearby points of interest. A hypothetical list would include the Plaza Library, Nelson-Atkins Art Museum, Westport, the Plaza, Mill Creek and Loose Parks, and perhaps along 39th Street West, near KU Med Center. The bikes could be used to navigate between any of these points. Situating the stations in this fashion would serve to further integrate the universities into the city, strengthening the institutional and social relationships between the two.

I addition, imagine the attraction of coming to Kansas City for the first time and being able to rent a bike to see all of these places .One can imagine the pleasant ride between the Nelson lawn and the fountains of the Plaza, or even the ease of enjoying the installed are at Mill Creek Park. Making Kansas City tourist nodes more interactive would undoubtedly heighten their appeal, while also spreading out tourist spending. In essence, we can provide access to the city that is both environmentally friendly and socially and economically conscious.

The expanded use of bicycles in Kansas City is a viable option to stave off our costly use of fossil fuels. In addition, other advantages would be the creation of bike maintenance jobs, the cultivation of a more active and healthy community, the thinning of automobile traffic, and a new recreational option for tourists and natives alike. A European public bicycle system is translatable into an American city like ours. We simply have to have the will and imagination to make it work.

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Bruce Copeland

E.S.C.R.O.W.
(Environmentally Sound Campus Renewing Our World)

E.S.C.R.O.W. is a holistic, methodological approach to begin change towards a sustainable campus, leading towards a sustainable city. E.S.C.R.O.W. focuses on an expansion of the UMKC Recycling program, the utilization of green and sustainable building practices for buildings on campus—along with green renovations of antiquated and inefficient buildings, and updating campus lighting to high-compact fluorescents,

PV powered outdoor lamps and widespread use of skylights and natural lighting. Also recommended is reduction of campus lawn care which leaves a large environmental footprint, replacement of carbon fuel official vehicles with alternative fuel campus vehicles, and the reduction of paper use in classrooms and in offices. Moreover, students would be encouraged to utilize locally grown and fair-trade foods, emphasizing also the composting of food waste to fertilize campus grounds, and encouraging clothing and furnishings recycling by students; unwanted items could be donated to community organizations.

David Scott Goth

Community-Wide Vinyl Billboard Recycling

Every year, Polyvinyl Chloride (PVC) billboard coverings are discarded into landfills where they create toxic pollution including lead, cadmium, phtalates and dioxins. If they are incinerated, they create hydrogen chloride gas that interacts with the atmosphere to create acid rain. The vinyl billboards are extremely durable, and are valuable resources currently being wasted. With a partnership with the UMKC Department of Art and Art History, these PVC coverings could be used to replace the expensive, stretched cotton canvases currently used by the department. The necessary equipment needed to turn PVC into canvases could be acquired through the local business community at a reasonably minimal initial investment. Moreover, other Schools and Departments at UMKC could be involved in locating resources for the "raw" material, whether from outdoor advertisers, large printers, local governments or even movie theatres. Eventually, PVC needs to be replaced by a more environmentally conscious alternative, but undertaking this step is a great beginning for physically removing toxins from landfills and laying down a foundation for future sustainability programs.

Chelsea Nicole Grigery

Maximization of the use of Time and Energy: Two Irreplaceable Resources

In certain academic plans, such as the BS/MD program, where large groups of students are share identical class schedules, UMKC

should work to structure the classes as to eliminate as much commuting time as possible. Eliminating the time between classes would motivate students to remain on campus instead of traveling. Furthermore, consolidating the required classes into a three day week would eliminate two extra days of commuting. Reduced fuel usage would decrease the amount of carbon dioxide emitted into the atmosphere for our region. This would be a step in addressing the global warming problem that impacts our world. The financial impacts of the savings from the reduced commuting requirements are also an important benefit. Although this does not directly impact environmental sustainability, it is important to the United States as it would decrease our country's dependency on foreign oil suppliers.

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James E. Galvin

The Essence of Sustainability is Adaptability

'Sustainable' is not a quality, it is a prediction. We observe that certain systems in nature are very, very old – savannahs, coral reefs, rainforests – and we infer that they must have some ability to sustain themselves throughout time. Our exploration of their sustainability has almost always lead us to notice that solar energy drives their whole systems, and that they place the highest premium on the retention and recirculation of nutrients. As a result, humanity today believes that we can achieve sustainability by switching to solar energy and by recycling. The impacts of solar power and recycling on the Earth's health today are obvious; that is, they are minimal if apparent at all. This would fit within our current, boundless economic system. The problem is that an infinite system is not sufficient to achieve true sustainability. Three principles are very important in determining a path to true sustainability: every entity has a responsibility to its habitat, and every element in the system is equally important, and the diversity of elements promotes stability. Observing these principles has both altruistic and self-serving results.

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Eric Salmon

Office of Sustainability

UMKC plays a very important role in the education of the Kansas City community. Therefore, if UMKC is to have the positive impact in our community that it is capable of, UMKC should establish an "Office of Sustainability". The purpose of the Office of Sustainability would be to

research, motivate, and involve students in the arena of environmental sustainability. It would accomplish this purpose in the following four areas: ideas, policies, classes, and networking.

Possible goals could include lowering vehicle dependency on campus. Various mechanisms could be implemented to do this, but the office could get people talking. Policies about construction work, transportation, and other environmentally relevant topics could be established to help regulate UMKC's ecological footprint. Classes could be offered that would educate the students about the dangers global warming pose to the environment. Lastly, networking with already established environmental organizations would allow the office to grow and make implementation of its policies more efficient.

Jessica Farmer

A Growing University: UMKC Community Gardens

A majority of people live in cities – a fact that is true in the United States and for the world as a whole. Urban sustainability will require new strategies for providing food that requires less fuel use. Luc Mougeot suggests that "[u]rban agriculture is one source of supply in urban food systems, one food security option, a tool for making productive use of urban spaces, treating/recovering urban solid and liquid wastes, saving or generating income, a source of employment, and a way to manage freshwater resources more effectively." A UMKC Community Garden could produce vegetables, herbs, and flowers, using organic methods. The garden could be placed on an unused plot of land owned by the university. Food produced on the plot would be a local food source for surrounding residents, as well as UMKC students, staff, and faculty. The produce could be distributed to the residents of the neighborhood through a Community Supported Agriculture program (CSA). Each subscriber to the program would receive a certain amount of fresh vegetables each week, which they would pay for in a monthly fee. Any profits made from the CSA program would be used to support the garden's operations. A UMKC Community Garden can be a model of urban agriculture, an educational tool, and also a way for the University to reach out to the surrounding community.