The Undergraduate Review

A JOURNAL OF UNDERGRADUATE RESEARCH AND CREATIVE WORK

Clement, Stilgoe, Connell, Kirkwood, Delahanty,
Masten, Lane, Stafford, Hambly, Cleary, Butler,
Williams, Morrish, Cannata, Dias, Famolare,
Wilson, O'Connell, Silvia, Forbes, Keith,
Nevens, McCormack, Fernandes
A Letter from the Editors

To be handed the baton in a relay race is a moment of immediate euphoria. To know that you are now part of a continuum to reach a goal is both thrilling and frightening. You sprint ahead knowing full well that every stride you take will result in the achievement or the failure of that goal. As you push ahead, you remember how hard the previous runner worked in handing you the baton in good faith, and as you draw nearer to the next runner you know that you must not let him down. You strive to maintain the smooth transition so as not to fumble and ruin the entire effort.

Yes, this is the experience the editors of the second edition were faced with: not to undo the landmark status of the inaugural edition of the journal, and, just as important, to implement new ideas that aid and guide the next editors in their task. Our goal has been met. Because of the wide-spread respect the first edition received, this edition features the work of students from all disciplines at BSC, lending to its girth and diversity. What we have learned from our fore-runners is interwoven within this journal with what they handed us, and this is nothing short of enlightening for the editors about to be handed the baton. We would like to thank our editorial advisor, Dr. Lee Torda in guiding us in this relay. She is our inspiration through her continual devotion to the students, their hard work, and to the Undergraduate Review.

As always, we would like to thank the Adrian Tinsley Program (ATP) for funding the journal, as well as the President’s Office and the Bridgewater Foundation for funding ATP. We would like to thank the ATP co-coordinators Drs. Ann Brunjes and Peter Saccocia, Drs. Andrew Harris and Sandra Neargarder of the Honors program, and Honors secretary Meredith Eckstrom for all of their assistance and encouragement with this edition of the journal.

We would like to thank the faculty readers for their time and effort in ensuring that Bridgewater State College’s undergraduates are acknowledged for their hard work.

We would like to thank those students for their contributions to the journal. Because of the research and writing that they have undertaken, this journal is one full of pride, ready to be handed on to the next runner.

We present to you the second edition of The Undergraduate Review.

Stacy Nistendirk, Nichole Wilson, and Tim Colwell
The Undergraduate Review Student Editors

Bridgewater State College
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Faculty Advisor's Note

I am entirely delighted to be able to present to you the second edition of The Bridgewater Review: A Journal of Undergraduate Research and Creative Work. Well, in all honestly, it's more like 80% delighted and a good 20% just plain relieved: this second edition of our journal has been a massive undertaking, and I must confess to having some doubts about whether or not we would pull it off.

The second edition is an entirely different beast than the first. Not that putting together the first edition didn't have its own set of difficulties: we went from having nothing to having something. That, in and of itself, is quite remarkable. And the two remarkable students who accomplished this, Rob Cannata and Amanda Forbes, deserve mention for it here. But if last year we went from nothing to something, this year we've gone from something to something entirely different: we've tripled our page number; expanded the disciplines represented; reorganized the offerings by category; and given the entire layout and design a needed face lift. It's a beautiful document, and I am very proud of it and the people that made it possible.

And so now to the thank yous: without the generous support of the Bridgewater Foundation and the Office of the President, The Adrian Tinsley Program would be unable to fund this journal. All of us at the UR are grateful for your continued and generous support. In addition to funding the journal, I want to thank my fellow ATP board members, Drs. Peter Saccocia, Tammy King, Teresa King, Don Padgett, and Shan Shan Cui for their support and their good proof-reading eyes—and a special and gigantic thank you to Dr. Ann Brunjes for proofing every page of this document (on her sabbatical, mind you). She has always championed the UR. I would also like to thank Dr. Ron Pitt, my boss, for helping me see this edition to its completion.

While Tim Colwell and Nichole Wilson were only with us as editors for a short time, their energy and effort was felt long after they left. Thank you to them for working on the journal during their last, busy semesters at the college. In the eleventh hour, Rob Cannata returned to help with layout. Many thanks to him; we couldn't have completed the journal without him. I would need an entire volume to thank Stacy Nistendirk for her commitment to this journal. Stacy is a remarkable person with many gifts, and we at the journal are lucky to have her back again this year as managing editor.
The UR this year had a guardian angel in Mr. John Cox, the art director and owner of Mediumstudio. Entirely pro bono, John essentially re-designed the journal for us, helping us work out some difficult layout problems and just generally making the document more lovely than I could have imagined it turning out. Thank you for sharing your time, energy, and tremendous gifts with us. People say this too often, but it very, very true in this instance: we couldn’t have done this without you.

No amount of funding, no amount of support, no editing skill really matters if there is nothing of merit to work with, and so I reserve my biggest thank you for the students and mentors whose important and collaborative work appear in these pages. You have always been and will continue to be the best reason to work at Bridgewater State College. I am endlessly impressed with our students and my colleagues.

On a personal note, working on this journal has had its share of difficulties to be sure. But it has had the most remarkable joys as well. I am humbled by the intellect and talent of the students at Bridgewater. I am inspired by the commitment of her faculty to those students. I am grateful to have had the chance to work with Rob, Amanda, Tim, Nichole, and, Stacy. So much piddly stuff can happen in a day or week or month on a job that can overshadow what is good and great about the work of it. I write here (to remind myself most of all) that this document will have a life beyond my career, beyond all of our careers at BSC, and it will testify long into the future as to the tremendous wit, energy, intelligence, and humanity of the Bridgewater State College community, especially her students and faculty.

I am grateful to have been able to give witness to it in these pages.

Enjoy.

Lee Torda
Director of Undergraduate Research
Faculty Advisor to The Undergraduate Review
No Ordinary English: Gertrude Stein Defines Literacy

by Nicole Williams and Amanda Morrish

Reading Gertrude Stein's experimental works (Tender Buttons, The Autobiography of Alice B. Toklas, How to Write, The Making of Americans) is like drowning in alphabet soup; you catch glimpses of words, their meanings flash through your mind, but you feel utterly helpless and can't tell which way is up. You start wondering, Did I just see a sentence? and Shouldn't there be some punctuation in this mess? Ask Stein for the answers and you'll get something like this:

...being intelligible is not what it seems, after all these things are a matter of habit. Take what the newspapers say about what you call the New Deal. If you know just ordinary English you do not have the slightest idea what the newspapers are talking about; everybody has their own English; it is only a matter of anybody getting used to an English anybody's English and then it is all right. After all when you say they do not understand [my writing] what do you mean...you mean by understanding that you can talk about it in the way that you have the habit of talking...putting it in other words...but I mean by understanding enjoyment. (Watts 91)

Loopy as her rationale may seem, Stein's writing is undeniably thought-provoking. In order to survive even one chapter though, you had better learn to like drowning.

You'll have to sacrifice your conventional notions of grammar, too. Stein insists that writers owe no one explicit form or context, and that readers are entirely capable of heavy brainwork. She rejects punctuation, relying instead on words and sentences to convey emotion, since

...capital letters and quotations marks are useless. They are hangovers from the days when people didn't read very well, that all goes into the
question of life and death of punctuation marks, if you don't know a question without a question mark what is the use of writing the question? ...the average reading mind does not need them. (Watts 94)

To individually intuit what Stein's words mean in relation to one another is no easy task. Even when we don't find plot or setting or well-developed characters (because those she thinks we can make up for ourselves), it is possible to make some sense of her works, to identify subjects and objects and modifiers within her sentences.

Stein's critics now call her style "Steinese." Reading Steinese is much like viewing cubist art. Stein and Pablo Picasso were friends, and when Picasso introduced his cubist paintings around 1909, Stein began implementing cubist styles into her own work. Both Stein's and Picasso's careers are split into two respective stages. Stein called her initial obscure style prose, and later transitioned to a second obscure style, which she called poetry. By examining these two phases in relation to the work that Picasso was doing, we can learn more about the roles that Stein assigns to writers and, most especially, to readers.

Analytic Cubism/ The First Obscure Style

Picasso started out using analytic cubism, and then shifted three years later to synthetic cubism. In his analytic phase, Picasso broke down subject matter into repetitive overlapping planes, using mostly browns, ochres, and greys. In this phase,

The whole picture surface is brought to life by interaction of the shaded, angular planes. Some of these planes seem to recede away from the eye into shallow depth, but this sensation is always counteracted by a succeeding passage which will lead the eye forward again up onto the picture plane. The optical sensation produced is comparable to that of running one's hand over an immensely elaborate, subtly carved sculpture in low relief. (Dubnick 4)

An example of this style is Picasso's Portrait of Wilhelm Unde (1910), a canvas full of brown and ochre repetitive shapes that create a sharp, angular look.

Portrait of Wilhelm Unde
Oil on canvas, 1910

The art community had never seen anything like this before, and although people understood that it was representational they still found it hard to understand.

The same is true of Stein's experimental works. She starts out by borrowing the repetitive characteristics of analytic cubism; in her early work, we see "Repeated clauses, extended syntax, and used a vague constricted vocabulary" (Dubnick 4). In Stein's The Making of Americans, she got "rid of nouns and adjectives as much as possible by the method of living in adverbs in verbs in pronouns in adverbial clauses written or implied and in conjunctions" (Dubnick 5). Her primary focus was on syntax. To her, individual words were of less importance than the sentence as a whole.

In Poetry and Grammar Stein writes, "The vocabulary in respect to prose is less important than the parts of speech, and the internal balance and the movement within the given space" (Dubnick 6). Stein linked clauses together in repetition in order to create movement within a long sentence, and then would collect them in paragraphs to develop larger meanings. That purposeful repetition "conveys a sense of process and duration, and of the time it takes to know a
person or understand an idea" (Dubnick 9).

In constructing her prose, Stein loosely developed meaning for the reader over long syntax. She does not give anything away with just one phrase but instead leaves the meaning to be decided at the end of the paragraph. This paragraph, taken from Stein's How to Write, is one of her favorites:

Pleasantly or presently. How or have. A sentence is. Made or make a meaning. Now feebly commence a sentence. How has he hurried. That is a paragraph because it means yet. How has he hurried. (26)

In that book, Stein models how she thinks one ought to write, but she gives unconventional and indirect instructions, leaving the reader at the end of each paragraph to interpret the message.

Synthetic Cubism/2nd Obscure Style

Picasso's synthetic style involved collage as well as a variety of color and textures, and he started using lines instead of cubes.

In this second phase the cubists began to use pictorial elements plastically, often composing works in which the original compositional ideas may have been developed by the arrogant of a few abstract pictorial shapes that suggested a subject rather than beginning with a subject that is analyzed. (Dubnick 4)

In Picasso's Green Still Life (1914), the focus is upon the objects on the table, but both the foreground and the background blend in tones of green.

During this stage, Stein was busy writing Tender Buttons. Halfway through the book she modified her style, adopting principles of synthetic cubism.

Now focusing on the word rather than on the sentence, her "Vocabulary is extended and syntax degenerates into sentence fragments" (Dubnick 5). Stein's emphasis shifted to vocabulary choice and suppression of the sentence. Her new style was about being in the moment, conscious of the world. She wanted to look more at the world around her and take in every part of it instead of simplifying it.

Since Stein's experimental writing was so largely influenced by Picasso's cubism, and because cubist art is generally thought to be abstract and non-representational, critics have made the mistake of calling Steine's abstract as well. However, synthetic cubism is completely focused on the concept of subject. The idea of being abstract means not focusing on a subject matter, and that is never the case with Stein. In Tender Buttons and subsequent writing, Stein's "subject matter is the intersection of the object with consciousness. Attention is focused on the process of perceiving and that process becomes part of the subject as well" (Dubnick 30). Not unlike Picasso, who broke up single subjects and portioned them into different elements, Stein's careful word choice is intended to describe a subject in a provocatively fragmented way. The work of Picasso and Stein is therefore not abstract, because it does focus on a subject matter.
To this day, after mucking through a few of Stein's jumbled pages, readers will typically respond to Steinese with concern, condemnation, disgust, or some combination of the three. Stein would combat these responses by suggesting that the average reader is spoiled, a creature of habit who has come to expect literature to provide some fantasy journey or some mirror of humankind or some opportunity to emote. Surely we have grown accustomed to literature that offers what critic Linda Watts calls "purposeful obscurity" -- a witty mixture of allusion, metaphor, and other meaningful subtleties. Stein, on the other hand, presents us with, "... the absence of fixed symbols writ large... truly free-form texts that convert[s] readers into writers" (112). For some, this reader-to-writer conversion can be painfully exhausting, but Watts thinks that for truly dedicated readers the experience can be one of liberation. She suggests that

If the reader truly collaborates, the writer no longer wields over an audience the final word on a text's implication. Neither does the author stand obliged to discipline the text such that it flatters the reader with the sensation of mastery in textual explication. In place of an orderly text, satisfyingly collected, is the prospect of a more ongoing relationship in which the reader and writer perform their identities and test out their understandings of the text and one another, a testing complete with missteps, misunderstandings, gaps, pleasures, and sensual play. (Watts 8, 9)

By pushing us to "truly collaborate" in this way, Stein is not completely unreasonable. In Understanding reading: a psycholinguistic analysis of reading and learning to read, literary theorist Frank Smith points out that all readers, when encountering narrative gaps (between chapters, for instance), subconsciously fill in the blanks. To be sure, Stein leaves us with no other choice! In order to make any sense at all of her rambling writing style, her reader absolutely must be an active participant. It is because Stein demands that her readers think for themselves that her works are so interesting and, in various ways, freeing.

Gertrude Stein was Postmodern before Postmodern. Although it's probably impossible to prove whether or not she actually meant to develop her own theory of literacy, she has. Her approach to reading and writing was revolutionary, open-ended, and therefore frustrating. She allowed readers to fully engage the text, not limiting themselves to her thoughts and ideas but coming up with their own. In Lives on the Boundary, a book which takes a look at undereducated students in America, Mike Rose writes, "Error marks the place where education begins" (Rose 189). If Rose's assertion is correct, then Steinese literature is a great place for one's literacy to take shape. Gertrude Stein places unusual faith in us as readers, fully expecting that with or without directed focus, we will create meaning as we read.

Any reader who is willing to meet these challenges stands to gain quite a lot. By sensing what is missing in the text, the reader gains a sharpened awareness of what reading is or can be. By trading in our conceptions of writers as authorities and by not interpreting narratives as absolute doctrines, we can experience our own personal literacy conversions. Once we accept that "Stein insists on a resourceful, active reader, one willing to take part in the text's formation, to contribute rather than comply" (Watts 8), each of us can come away from her work knowing that by reading we have in fact accomplished something, created something, shared in something.
Works Cited


Read to a Child and Change the World

by Dorothy Famolare

It has often been said that learning to read begins at home with reading aloud to young children. We can all relate to childhood memories of curling up on the sofa with a parent or grandparent to read a favorite book. Even before the ability to actually read the words on the page came the pleasure of seeing the pictures as we were read to. While this Norman Rockwell moment is in itself a sentimental cherished childhood memory, it is also the foundation of literacy; it is the beginning of a lifelong journey to become a fully literate individual. The poignancy of these memories can be equated with other life lessons learned, from the small, to the monumental: tying shoes, riding a bike, driving a car. Sometimes, the importance of these memories can only be recognized in hindsight, after we have grown, and can appreciate what a gift we had been given. How were we to know that those tender moments could hold the keys that unlocked our hearts, our minds, and our future? The gift of literacy, that is born in those moments, stay with us always.

Literacy is not just the ability to read a recipe, a street sign, or a medicine bottle. To be truly, fully literate means so much more. In an all encompassing, or global context, literacy can be expressed as the ability to read different types of texts with a discerning eye and analytical mind for the purpose of formulating theories, reacting with emotion, and acting upon those ideas and emotions for the advancement of society through meaningful dialogue and social activism. The ability to formulate theories about a particular written work, leads to problem solving within the text, and beyond the text, in real life situations. Literacy is therefore, a beginning, not a final objective for learning. Reading to children is the first step to moving beyond concrete knowledge, toward more abstract thinking and theorizing.

Reading aloud to children stimulates their imagination, introduces them to the outside world, communicates cultural awareness and values, and helps
establish a foundation for learning. Additionally, frequent reading will help children acquire intrinsic knowledge, and critical thinking skills that they will need to create meaning from texts as they learn to read on their own. Parents and other caregivers who read aloud to their children are also demonstrating to them the importance that books and reading have in their lives (Journal of Blacks in Higher Education 12). Children learn as they grow older that their future plans depend on their ability to read well. Getting children interested in books and learning at an early age is probably one of the most important legacies a parent can leave a child. However, there are some parents who have great difficulty reading to their children either because the books are not written in the parent’s native language, or because they are marginal readers themselves. Studies have shown that in such cases, with a little outside help and patience, both parent and child can learn to read together (Malo).

Reading to children not only promotes literacy, it can also end the cycle of poverty in some families where illiteracy is the primary cause.

Among the myriad reading skills that can be acquired by reading aloud is the “concept of story”, because stories have a beginning, middle, and end. As the story unfolds the plot can include complexities such as, “broad descriptions, details, and sub-plots.” Children exposed to storytelling begin to understand the “concept of character development,” beginning with simple good and bad characters, to more complex characters as the child grows (Malo 6-8). This can be an important life lesson as well, because children learn to recognize character traits: honesty, intelligence, vanity, courage, cruelty, etc. The children gain intrinsic and “intuitive knowledge” about a character’s personality, depth, and purpose to the story. This intuition shifts to “prediction skills” as children learn to “anticipate what comes next” in the story (Malo 6-8). These intuitive and anticipatory skills can also have importance in the world outside of books as they become a sort of sixth sense that the child uses to discern intent, or intention, of people and situations they come in contact with throughout their lives. Rather than growing up gullible and complacent, children become more sophisticated and question the motives of those who are in a positions of authority and power.

Children also learn other skills from the interaction that occurs during the relating and retelling of stories such as, acquisition of oral listening skills and narrative organization skills that later translate to reading and writing skills. During story time,

“Young children are routinely involved in literacy events as part of their interactions with adults and eventually one another.

Story reading is an interactive negotiation during which time certain sequences of interaction are acquired and ways of organizing narrative are presented and mediated through the adults who display to children ways of taking information and giving it back” (Schieffelin 181).

This oral reciprocity of information gathering and giving is reiterated in Rosenblatt’s Literature as exploration, in which reading is described as a reciprocal process between the reader and text, as the reader makes meaning out of the words on the page (Rosenblatt 26). Just as independent reading helps the reader make meaning out of the text, reading aloud helps young children make meaning out of text. Young children can then question, discuss, and internalize the story they have “read” to make meaning out of their world.

The early beginnings to literacy from reading aloud transform into greater knowledge needed to become proficient readers. As young children listen to a story and follow along in the book with their eyes they are storing visual pictures and information that will be stored in memory then drawn upon and referred to in later reading experiences. Frank Smith talks about this eye-brain relationship during reading and he claims that the non-visual information, or prior knowledge, that is stored in the brain for later retrieval
when reading is just as important as the visual information the brain receives from the eyes during the act of reading. The non-visual information helps to make meaning out of what the eyes are reading (82). Even young children who cannot yet read are not just passively listening and looking on while being read to, they are gathering a wealth of information for later use when they can read independently.

The wealth of information that is acquired over time as a child reads becomes a foundation for reading comprehension. Once the knowledge is accumulated of letters into words, words into phrases, and phrases into sentences, then the contextual understanding begins to evolve. Smith describes this understanding as "the ability to get a sense of the whole of a text" rather than focusing on individual words (82). This type of reading comprehension involves the ability to understand in context what particular words on a page mean in relation to the entire text. As children learn to understand what the words mean in the context they are used they can then respond intellectually to the experience of reading.

Responding to reading is a reciprocal process between the reader and text, whereby "the meaning emerges as the reader carries on give-and-take with the signs on the page" (Rosenblatt 26). It is also a process of development that is constructed over time. Rosenblatt notes that even "beginning readers draw on past experience of life and language to elicit meaning from the printed words, and it is possible to see how through these words he reorganizes past experience to attain new understanding" (25). This idea of drawing on past life experiences to draw meaning from a text may benefit adults who are learning to read even more so than children; adults have a much larger well from which to draw.

As the reader grows in life experiences, his literary, and therefore literacy, experience also grows with frequent reading. The more a reader reads, the greater his/her literary knowledge becomes. This knowledge base becomes important for many reasons including, the increased ability to read between the lines of a text; to be able to "bridge the gaps" between what is said and what is not said, to achieve a richer, more meaningful reading (Iser 9). While this is certainly important as part of the aesthetic experience of reading literature, it is equally important as part of the everyday experience of reading everything from the newspaper to a loan application. To be able to understand the complexities of such everyday literature can mean the difference between being in control of our world, to being controlled by others who have this ability. As a child's (or adult's) reading comprehension increases, the ability to read well any type of discourse whether literature, scientific journals, or even the newspaper increases as well. The critical thinking skills and intrinsic knowledge mentioned earlier are part of the basis for understanding these other type of texts. Additionally, if a child, or young adult experiences a temporary gap in their formal education, these skills along with a more proficient reading comprehension will better enable them to bridge any gaps in learning that have occurred. By filling in the gaps to their education, they become more empowered to make smarter choices in life, leading to a better life economically, as well as intellectually. The benefits of reading proficiency can have far reaching effects even into future generations. Reading can change lives.

Along with the literacy skills that children learn while reading stories are the concepts of cultural identity; both individually, and of the world around them. Children learn about their own culture and other cultures through stories. They formulate ideas about the differences and similarities to their native culture, and they try to identify and position themselves within the larger cultural community. This "cultural literacy" is just as important as the ability to read in becoming a fully literate individual.

Children who are only exposed to their own culture's histories, beliefs and practices become "culturally deficient." Moreover, children who develop in an environment that lacks
“breadth and depth in educationally stimulating activities such as books, the arts, and world culture, will likely enter school unmotivated, diffident, unaware, and uninterested” (Newton185). On the other hand, if children are given opportunities to explore other cultures through reading and storytelling they are more likely to be tolerant, interested, and aware of the diversity of their world. Additionally, “If diversity is an integral component of young children's learning experiences during the formative years of schooling, they will come to accept it as fundamental to American life, world culture, and the human condition” (Gay 325). Paolo Freire put it best when he said we need “to read the world” before we “read the word.” He says “Reading does not consist merely of decoding the written word or language; rather, it is preceded by and intertwined with knowledge of the world” (29). In other words, children need to become familiar with the world that surrounds them, through varied contexts and experiences, in order to make meaning from the written word. As the child's limited circle of experiences expands with increasing age, beginning from home and expanding to include: neighborhood, city, country, and finally to the global community, their perspective and awareness of the world also increases.

The larger, more universal meaning to being culturally literate is that as adults, we don't just read about our own community and individual culture, we read about things that concern the world as a global community. In order to connect with the concerns of other cultures within the global community we need to have some knowledge about them beyond merely geographical and political information. We need to feel that they are like neighbors that we have observed daily doing the same everyday things we do, with the same everyday concerns about life. We need to shift our thinking beyond the context of us and them to the context of we. Reading about other cultures as part of experiencing the diversity of our world can change people's attitudes and opinions. Reading can change the world.

Another important aspect of literacy is the ability to communicate in writing. That there is a relationship between reading and writing is well known, however, it may not be so widely known that writing skills are acquired in much the same way as learning a second language. In order to master another language one must have direct input of the language over a period of time to gain comprehension. According to one particular scholar, Steve Krashen, writing skills develop on the basis of the same principles of language acquisition, which involves the “unconscious assimilation” of language over time. Krashen argues that “we gain competence in writing the same way we gain competence in oral language, by comprehending written discourse and internalizing, after much exposure, the numerous conventions that characterize texts.” He believes that reading is the primary means to gaining competence in writing. Krashen calls this the reading hypothesis, and he argues three important points to this hypothesis which are: (a) “all good writers will have done large amounts of pleasure reading”(b) “good writers, as a group, read and have read more than poor writers” (c) "reading remains the only way of developing competence in writing” (Williams 166).

While Krashen believes that reading is important to developing writing skills, he also feels that it does not guarantee that because someone is an excellent reader they will also be a naturally exceptional writer. He believes there is also a natural aptitude for writing that predicates this hypothesis (Williams 167). However, this natural aptitude that Krashen speaks of may have more to do with aesthetics and creativity than ability. How many of us have had to read brilliant, but dry texts written by highly intelligent scholars? These people are very well educated and no doubt have done a tremendous amount of reading in their lives; however, they appear to lack the ability to write with a certain style and flair that appeals to the reader. Regardless of whether someone has a natural ability for stylistic writing and wants to be a writer professionally, writing remains an important part of
literacy, and reading appears to have a direct effect on writing ability. The basic premise behind literacy is that it involves the ability to absorb, interpret, and communicate ideas and emotions into written language, with competence and confidence that the meaning will be comprehended from the writer to the reader. The more reading that we do, the better able we become to draw from the vast resource of what we have read, to use as a source of information, inspiration, and as a guide for what constitutes good writing.

Complete literacy is multidimensional, with technical components, social aspects, and cultural and educational implications. The act of reading to children to develop literacy skills is important on all of these levels; it is a foundation to help children become fully literate adults. But perhaps more importantly, reading to children, and with children, is the most important legacy we can give our children, not just for the tender memories it will instill, but also for all of the opportunities it will provide. When we teach our children how to read, when we teach them the importance of books and learning, we lay the world at their feet, and the future at their fingertips. We give them competence to compete economically, and confidence to succeed educationally. With carefully chosen books we can teach them things like tolerance and compassion toward others, and reasoning skills so that they are able to think for themselves and not be swayed by those who would take advantage of them. As history has shown us time and again, illiteracy at any level is an invitation to oppression.

Bibliography


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So That's What It's Like

BY LAURA O'CONNELL

I was clutching a handful of confetti
for what seemed like forever,
wondering if I'd ever have a reason to celebrate,
to toss those heart-shaped pieces
of pink paper WEE! into the air.

Then I bumped into you—literally—
and those figurative paper hearts
grew fluttering figuratively through the air.
My first thought was, "My confetti is gone!
Wasted on this accidental human being!"

I saw red heart-shaped balloons rising into the air.
I knew they must be yours, lost in the collision.
(And you, too, initially lamented their loss.)
Pretty pink bits descended upon us.
I turned back and saw you for the first time.

It was a good sight. We stared in wonder
(at imaginary confetti and balloons!)
at one another. It occurred to both of us
in that same instant—this must be
what they call "love at first sight."

At last.
I thought, "No more confetti
getting soggy in my clenched fist."
And you knew you would never need
to refill deflated balloons again.

Laura graduated in May 2005 with a BA in English. Her poem, "So That's What It's Like", was originally written for Dr. Tabakow's Poetry Writing Workshop, and then was used as part of her Revision Project for Dr. Lee Torda's Advanced Portfolio Workshop. She also read this poem at the Writer's Cafe held in April 2005. Laura is currently working at an American Heart Association Journal based in Boston.
If power is always related "to the historical production of truth," as Michel Foucault maintains, then any examination of power in the narrative of The Lord of the Rings must take into account the role of history (McHoul 57). As the prologue of the first film reveals, the history of the The Lord of the Rings consists of the Ring’s creation, the Great War that ensued, and the severing of the Ring from Sauron's hand. Through this history, central to the plot of The Lord of the Rings, the Ring becomes a perfect exemplar of how knowledge creates power. As Foucault states, "there is no [...] knowledge that does not presuppose and constitute [...] power relations" (27). While Sauron does have actual power, the characters' knowledge of that power enhances and extends it so much so that even when he is disembodied, their fear of Sauron remains. This fear is often expressed as fear of the Ring and is already visible in the prologue, in which Galadriel asserts that "the power of the Ring could not be undone" and "the Ring of Power has a will of its own" (Walsh, Fellowship).

The belief in Sauron’s omnipotence is clearly demonstrated when Saruman, the greatest of the wizards, succumbs to despair because of his use of a palantir. Saruman allies himself with Sauron because of the information he receives through the palantir. This information leads him to believe that “[a]gainst the power of Mordor there can be no victory” (Walsh, Fellowship). The capitulation of Saruman reinforces the Foucauldian notion that power produces truth through knowledge. The truth, as Saruman sees it, is that Sauron is insurmountable. Yet, Sauron needs others to believe this fiction for it (and through it, him) to have any power. If Saruman did not believe in this produced truth, it would have no power over him.

Denethor also succumbs to despair as a result of trusting a palantir. Although Denethor's use of the palantir is not directly recounted in Jackson's The Return of the King, he exclaims, "Do you think the eyes of the white tower are blind?
I have seen more than you know,” implicitly admitting that he has looked into the palantir. In the novel, he is directly referring to the palantir in his hand. In the film, Denethor’s further assertion that “Against the power that has risen in the east, there is no victory” is related to the knowledge, fed to him by Sauron through the palantir, that the Black Ships are approaching Gondor. (What he does not know is that those ships hold Aragorn and his army, and not the enemy.) Sauron’s deliberate misinformation causes Denethor’s despair and thus consolidates Sauron’s power over him.

While the other characters believe in Sauron’s supremacy, they do not yield to the despair he promotes. As Kocher notes, “The whole venture of the Ring always looks desperate. […] Yet against all persuasions to despair, Gandalf, Aragorn, […] and all those who fight beside them hope on and keep on acting upon their hope. Without that, Sauron would have won a dozen times over” (55-56). Their irrational persistence indicates that although they acknowledge, what Foucault would call the produced truth, they do not fully submit to it. They possess a gleam of hope, symbolized by the journey of the hobbits. Although Frodo and Sam’s mission is often deemed a “fool’s hope,” the other characters protect Middle Earth from the encroaching armies of Mordor and Isengard in order to give Frodo and Sam time to destroy the Ring. In this way, they resist the “discourse of truth” (Brown 31). As Brown explains, “discourses are loci of knowledge [that are] neither stable nor monolithic,” and “no discourse [can] cover the diversity of truths” (31). Each character resists the produced discourse of truth that Sauron is invincible by allowing the small hope that there could be an outcome other than their destruction. By doing this, they oppose the dominant idea and create their own truth. It is the possibility for truths other than the one produced by the dominant power that makes Sauron’s downfall ultimately achievable.

Even though he carries the Ring, Frodo has no control over it, because it is the physical representation of Sauron himself. As the Ring bearer, Frodo becomes “a reality fabricated by this specific technology of power [that Foucault calls] a ‘discipline’” (Foucault 194). Frodo is in physical control of the Ring, but he is, as Foucault would say, disciplined by it. This discipline may not be as rigorous as Foucault’s example of a prison timetable in his work Discipline and Punish, wherein every moment of the day has a specific and regimented purpose; but Frodo does have a specific purpose: to go to Mordor and destroy the Ring. He must do this before he is found or Sauron’s armies overwhelm Middle Earth. And while “Traditionally, power was what was seen […] disciplinary power […] is exercised through its invisibility” (Foucault 187). The importance of not being seen is obvious when, in order to avoid capture, Frodo changes his name, hides his purpose and prohibits any obvious firelight. But capture is an ever-present possibility, as Sauron has many creatures searching for Frodo, including the ubiquitous Ringwraiths.

Frodo can escape observation if he wears the Ring, which makes him invisible. But, in doing so, he subjects himself to the “All seeing eye” of Sauron. The more he wears the Ring, the more he subjects himself to this “inspecting gaze […] which each individual under its weight [begins...] interiorising to the point that he is his own overseer” (Foucault, Power/Knowledge 155). Thus he is in constant fear of being seen, whether he is physically visible or not, and “it is the fact of being constantly seen, of being able always to be seen, that maintains the disciplined individual in his subjection” (Foucault 187). When wearing the Ring, Frodo’s situation parallels that of the prisoners under the surveillance of the Panopticon: the prisoners are kept under endless surveillance, and yet they are invisible to each other. Similarly, when Frodo is wearing the Ring, he cannot clearly see the world around him, but he can see — and be seen by — Sauron’s great “lidless” Panoptic eye.

While Sauron may be the “all seeing eye,” he is far from the omnipotent force that Saruman believes he is. As Foucault observes, “the perfect disciplinary gaze would make
it possible for a single gaze to see everything constantly” (Foucault 173). But Sauron cannot do this: his inability to see beyond his realm without the assistance of palantiri and Ringwraiths illustrates his lack of omnipotence. To effectively use his palantir, Sauron must rely on the weakness of various individuals who also have palantiri. His reliance on the Ringwraiths also demonstrates his imperfect gaze. He needs the Ringwraiths to capture Frodo and the Ring, but they are remarkably ineffectual. They are, however, perfect examples of Foucauldian delinquents.

According to Foucault, the modern prison system is interested not in torturing the body but in controlling the soul. Once criminals are punished, he argues, they are forever caught up in the prison system as part of an information-gathering network serving the dominant power. Foucault refers to this inconspicuous incorporation as “delinquency.” Similarly, the Ringwraiths were once “men, who above all else, desire[d] power,” and as Aragorn explains to Frodo, because of their lust for power, they became “blinded by their greed, […] one by one falling into darkness. Now they are slaves to
capture Frodo; but as Foucault makes clear, in the modern prison system the role of the delinquent is not to apprehend. Their purpose is to observe, a task that the Ringwraiths do fulfill.

Gollum is a far more efficient tool of the Dark Lord. Unlike the Ringwraiths, he successfully locates and tracks Frodo, feigning servitude in an attempt to gain the Ring. Gollum’s surveillance of Frodo is motivated by his desire for the Ring, rather than by instructions from Sauron. But the Ring is a part of Sauron. This connection between Ring and Dark Lord, paired with the possibility that Gollum was “let out” of Mordor, makes Gollum a more effective, although ultimately more dangerous, delinquent.

If delinquency is the insistent observation of and for the Ring once the individual has been dominated by it, then the Ring can be compared to incarceration. Once incorporated into the disciplinary system, the individual has no power but what is allowed by the prison/Ring. Individuals released from the prison system tend to repeatedly return to it, just as those corrupted by the Ring have an ingrained need to seek it out. This delinquency is demonstrated not only by the Ringwraiths and Gollum but by Sauron himself. While the Ring is a physical extension of Sauron, it is often identified as an independent agent: “it betrayed Isildur,” “the Ring of Power perceived,” “it abandoned Gollum,” “it wants to return” (Walsh, Fellowship; my emphasis). And despite his supposed omnipotence, Sauron needs the Ring to assume corporeal form, because a large part of his spirit resides within it. Without the Ring, Sauron is not “above fear,” as Gandalf puts it. He tells Aragorn, “Doubt ever gnaws at [Sauron]. The rumor has reached him [that] [t]he heir of Númenor still lives. Sauron fears you, Aragorn. He fears what you may become” (Walsh, Towers). As the heir to the throne, Aragorn could wield the Ring and destroy Sauron, although in doing so he would become like Sauron. Because of this possibility, Sauron fears his own destruction and enacts a fervent search for the Ring. It is this recidivistic need for the Ring that characterizes Sauron as the ultimate delinquent of his own prison.

Figure 1 – While appearing very similar to the central tower of a Panopticon, Sauron’s eye is focused on one place and is not “all-seeing.” Image © New Line Cinema, 2003.

[Sauron’s] will” (Walsh, Fellowship). Just as the delinquency of the criminal gives the dominant power a wider range of surveillance, the Ringwraiths hunt Frodo for Sauron because Sauron possesses their souls. The Ringwraiths are unable to
By enacting his delinquency, Sauron forms a recognizable (although theoretically imperfect) panoptic image. In *Return of the King*, as Sam and Frodo cross Mordor, they see Sauron’s tower and his great eye searching Mordor (Figure 1). This image resembles the panoptic tower, or Panopticon, except that the Panopticon can see everywhere simultaneously while Sauron only observes one place at a time. Sauron’s power creates a Panopticon in another sense, however. Mordor is barren, the orcs are tortured perversions of elves, and Sauron’s citizens are a monolithic army. As Patrick Curry states, “the non-allegorical nature of the Ring is [...] the willful exercise of power applied instrumentally to the realization of a single overarching goal”; he adds, “[t]he precise nature of that power is homogeneity” (146). This eschewing of diversity is likewise the ultimate effect of the Panopticon, which erases all individuality amongst its subjects and produces uniformity as an effect of power. This uniformity is rejected by the diversity of the Fellowship, which includes representatives from each of the Free Peoples of Middle Earth. Even after the Fellowship is broken, the characters each continue to support some aspect of the quest. While Sam and Frodo bring the Ring to Mordor, the others (through various actions) contribute to the survival of the Free Peoples at the battle of Pelennor Fields; ultimately they stand together before the Black Gate to divert Sauron’s attention at the essential moment. The Battle of the Last Alliance before the Black Gate parallels Frodo’s quest to destroy the Ring because they both necessitate self-sacrifice in the face of insurmountable odds. Each action also constitutes a rejection of the idea of ultimate power.

But the rejection of absolute power is only one step towards the destruction of this power. The success of the mission depends upon the existence of a “loophole” in the Panoptic power structure. In her discussion of Panopticism in Harriet Jacobs’ *Incidents in the Life of a Slave Girl*, Michelle Burnham examines the existence of these overlooked sites of agency. According to the *Oxford English Dictionary*, as Burnham points out, a loophole is both “A narrow vertical opening, [...] cut in a wall or other defence, to allow of the passage of missiles” as well as “An outlet or means of escape.” In the physical sense, the major loophole in *The Lord of the Rings* is the tunnel that comprises Shelob’s lair. When Frodo and Sam make it to Mordor they come to a giant black gate guarding the entrance. Unaware of any other way in, they are about to walk through Mordor’s main gate when Gollum stops them. He leads them to a tunnel through the mountains, which is also the lair of Shelob, a giant spider. This space is unobserved by Sauron because it is unknown by outsiders, and Shelob kills all who enter. Gollum also knows about Shelob and is luring Frodo to her in order to get the Ring from Frodo’s corpse. This passage in the mountain creates what Burnham refers to as an “inevitable blind spot” in Panopticism (Burnham 289). This blind spot exists “in sites that elude the gaze not because they are outside the structure [...] but because they are clearly and centrally a part of it”; Sauron is not watching the tunnel through the mountains because he does not believe anyone could pass through it (Burnham 289). Of course, Frodo would be unable to survive Shelob without Galadriel’s phial, whose light repels Shelob and becomes a method for attaining agency. Thus, the loophole is created “by relocating agency [here symbolized by the phial] in the juncture between the structure [the tunnel] and the subject [Frodo]” (Burnham 289). Frodo’s access to the tunnel and repulsion of Shelob create a combination of circumstances that Sauron is unable to predict. The existence of this loophole allows Frodo and Sam to enter Mordor with the Ring, and the passage through the tunnel becomes the “outlet” of freedom for Middle Earth. Shelob’s lair also has the physical properties of an actual loophole, “A narrow [...] opening [...] cut in a wall or other defence, to allow [...] the passage of missiles,” as the Ring passes through this loophole to become the weapon that destroys Sauron.
Because Gollum is the character who destroys the Ring, his role in facilitating the physical loophole is essential. As a delinquent, Gollum can be said to “inevitably support the dominant power structures [he] might have set out to resist and subvert” (Burnham 285). Gollum resists Sauron, and the Ring’s attempt to return to him, because he wants the Ring for himself. With this selfish desire he tracks and finds Frodo. Yet, if Gollum was “let out” of Mordor, as Gandalf speculates, then he unknowingly assists Sauron in his search for Frodo. Gollum ultimately – and also unintentionally – thwarts Sauron and fulfills Frodo’s quest to destroy the Ring, thus inadvertently subverting his own desire. His need for the Ring (and perhaps a bit of what Tolkien calls ‘chance’) enables the quest to succeed where it otherwise would have failed. Not only does Gollum show Frodo Shelob’s tunnel, which is the only unobserved entrance to Mordor, but he also delivers the Ring into the lava when Frodo could not. By trying to hinder the quest, Gollum completes it.

Yet Gollum isn’t the only delinquent to undermine his own aspirations. The men who became Ringwraiths took the Rings of Power for their own self-aggrandizement. But instead of gaining power they became wraiths, enslaved to a stronger will. Even Sauron’s actions inevitably cause his demise. Before he made the Ring, Sauron had the ability, however difficult and time consuming, to recorporealize his spirit after (supposed) death. When Sauron created the Ring, however, he did so by infusing a large piece of his spirit within it. This initially made Sauron stronger, but when the Ring is separated from him, he diminishes. When the Ring is destroyed there is not enough of Sauron’s spirit left to retain any cohesive form and, according to the novel, he “rose a huge shape of shadow...terrible but impotent,” to be taken by the wind (Tolkien 928). Thus, in creating the Ring for his own selfish motives, he actually undermines his true purpose by creating the only possibility for his complete destruction.

Sauron’s single-mindedness doubly hinders his ultimate goal. When Aragorn confronts Sauron through the Gondorian palantir, Sauron assumes Aragorn has the Ring because, as the heir to Gondor, he would be capable of wielding it, and it would be suicidal to attack Mordor without it. This assumption backfires on Sauron as Aragorn’s challenge is only a lure to assist Frodo and Sam by emptying Mordor of its armies. Sauron’s narrow-mindedness is best stated by Gandalf when he says, “that we should seek to destroy [the Ring] has not yet entered [his] darkest dreams” (Walsh, Towers). In his myopia, Sauron is unable to understand that anyone could resist the Ring, much less give up their lives to destroy it. This “inability of complete evil to understand self-renunciatory motives is consciously exploited by Sauron’s antagonists in their decision to attempt the destruction of the Ring” (Rosebury 37). Sauron’s inability to understand the thoughts of others enables his destruction and proves that he is not an omnipotent, “all-seeing” Panopticon. The knowledge that creates the Panopticon’s power – the knowledge of an everlasting, anonymous gaze – reinforces the control of the Panopticon. The gaze of the tower cannot be influenced because the guards are numerous and ever changing. Sauron’s gaze, on the other hand, is individualized, and because he has a specific and well-known agenda, he can be easily manipulated.

In the end the most obvious loophole is perhaps the least easy to recognize. This is the idea of combating despair with hope. In order for the quest to exist, there must be the belief, however small, in success against this supposedly omnipotent being. This hope, a resistance to the produced truth which is manifested in differing degrees by all the good characters, is the most pervasive loophole. Sauron fails to recognize the determination of individuals, reminding us that the Panopticon “allows thought to remain hidden, even under the most intense scrutiny” (Burnham 286). The inability to control thought weakens the dominant truth and becomes the flaw that destroys the entire apparatus of authoritative power. As Burnham explains in the context of African-American Slavery, “those seemingly monolithic methods of
surveillance that ostensibly make escape from detection impossible may finally enable escape by the very fact that they make it seem so impossible" (Burnham 288). In *The Lord of the Rings*, Sauron's downfall is enacted by his own seeming omnipotence, and the once powerful "all seeing eye" falls to a hobbit-sized flaw.

**Works Cited**


Corie graduated from Bridgewater State College with a Double Major in English and Art. She wrote this piece for Dr. Garland Kimmer’s Seminar course on Virginia Woolf and William Butler Yeats. Corie is planning a career in the Fine Arts field.

Pieces of Virginia: Post-Impressionism and Cubism in the Works of Virginia Woolf

by Corie Dias

In the autumn of 1910, author Virginia Woolf and her sister Vanessa Bell attended the highly controversial Post-Impressionist Ball, organized by artist and art critic Roger Fry. According to biographer Quentin Bell, the two women went “as bare-shouldered bare-legged Gauguin girls, almost-as it seemed to the indignant ladies who swept out in protest-almost naked” (Bell 170). This scene well represents the larger events that occurred and attitudes that existed during that time period in Bloomsbury, a group of authors, critics, and artists who met and worked together to explore art, politics, and life in general. These members included among others Virginia and Leonard Woolf, both writers, artists Clive and Vanessa Bell, Fry, artist Duncan Grant, writer Lytton Strachey, newspaper critic Desmond McCarthy, and Thoby Stephen, older brother of Virginia and Vanessa who formed the group that was to become, after his death, Bloomsbury. Their world was one of artistic progress and controversy that was questioned by the society around it, and it played a large part in forming the great writer that Woolf was to become.

Woolf’s writing presents the reader with a new kind of perspective, one that shows multiple angles simultaneously. This kind of writing mirrors verbally what many experimental visual artists were doing in terms of painting at the turn of the twentieth century. Woolf’s step in this direction in literature shows the influence of Roger Fry, particularly the Post-Impressionist Exhibition, and other influential artists that Woolf came into contact with through Bloomsbury and mutual acquaintances. These artists inspired Woolf to use elements of both post-impressionism and cubism verbally to make her stories like paintings that move, clear and distinct but always shifting. She incorporates both the emotional elements of post-impressionism and the fragmented methods of cubism to create her own representation of life. Examples of this kind of writing include To The Lighthouse, Mrs. Dalloway, and The Waves.
To examine Woolf's use of artistic elements in her writing, it is necessary to look at both the artwork of the early twentieth century and Woolf's innovative novels of the same time period. A strong connection can be seen between this writing and the kind of artwork produced in the Cubist and Post-Impressionist styles. Post-impressionist work is based more on feeling than visual fact, and is more personally expressive than it is visually realistic. Through light and color, an abstract work is produced that has a sense of movement and change.

Cubism, a style included within the larger frame of post-impressionism, deals specifically with showing a number of different perspectives at the same time. According to *Modern Art* by Sam Hunter, John Jacobus, and Daniel Wheeler, "Being composite, an image represented in this fashion conformed to the new, scientific knowledge that human perception derives not from a single, all-encompassing glance but from a succession of 'takes,' from experience stored in the memory, and from the intellect's capacity to conceptualize form" (*Modern Art* 133). Perhaps the best known work "based on a number of takes" to come out of this time period is "Guitar Player" by Pablo Picasso. Rather than presenting the viewer with a traditional realist portrait of the guitar player, Picasso presents the viewer with all possible sides of the guitar player at once, rather than just one portion. A human form can be detected, but it is divided into small, angular pieces. Picasso's use of light and shadow in painting these fragments gives the picture greater depth, enhancing the human form. The Cubists created a different way of seeing that age-old subject matter in the art world, the human body.

These new artistic concepts were ones that Woolf was introduced to by the year 1910, when she first came into contact with artist and art critic Roger Fry through her sister Vanessa and her husband Clive, who were also artists. Until that time, Fry had been seen as a fairly conservative artist and art scholar. However, in 1910, things changed. Woolf biographer Quentin Bell discusses the events of that year in *Virginia Woolf: A Biography*:

He [Fry] was in fact a highly respectable and well-established figure until the autumn of 1910 when, as it seemed to many of his old friends and admirers, he had taken leave of his senses and, to his enemies, that he had willfully and wickedly entered into a conspiracy with hoaxers, crooks, and criminals of the Parisian underworld. In short, he had asked the British public to look at and to admire the works of Cézanne. (Bell 167)

Paul Cézanne was an artist who took impressionism beyond what his contemporaries were doing, emphasizing feeling through light and color with a sense of movement and spontaneity (Harden 1). An example of this would be his work "Mount Sainte-Victoire," c. 1894-1900, shown below. This piece is obviously not meant to be a photo-realistic portrayal of a mountain; the interest lies in the visible brushstrokes and vibrant color that make this piece look as if it is moving and changing right before the viewer's eyes. This kind of work would later inspire such artists as Pablo Picasso and Georges Braque to become the fathers of Cubism (Harden 2).

Fry was greatly influenced by this type of art, incorporating such work into his own theories about art. Although Woolf herself was not a visual artist, she could hardly avoid the conflict surrounding Fry in 1910. Bell points out, "The
atmosphere engendered by him and by the exhibition made her circle a little more centripetal, a little more conscious of being revolutionary and notorious” (Bell 168). But this exhibition had an effect on more people than just Roger Fry and the Bloomsbury group; society in general found the paintings both disturbing and offensive. Miriam Hansen discusses this event in her essay “T.E. Hulme, Mercenary of Modernism, or Fragments of Avant-garde Sensibility in Pre-World War I Britain”: “The works confronted gallery-goers with new ‘distorted’ conceptions of empirical reality, particularly of the human face and body; they drew attention to their own material surface rather than offering a window to the world; they undermined the system” (Hansen 360). These changing artistic values disturbed and even frightened the public, in their deviation from what was normal and accepted, in the more traditional works of art.

The Cubist movement was met with an even more negative public reaction, led by Fauvist Henri Matisse. Matisse was part of the committee that picked the works for the famous Salon shows in France, and he did not hesitate to reject the “objectionable” pieces featuring angular images and strange color palettes. Matisse coined the term Cubism, as he derogatively referred to such works as petits cubes, a des cubes, and bizarreries caciques. These Cubist artists, according to Modern Art, “brought about a revolution in pictorial vision so total that it all but shattered that of the Renaissance...they also challenged the age-old sanctity and significance of the human image” (Modern Art 132-133). This revolution, met with so much disapproval, changed the way people looked at art, bringing a fresh perspective to both painting and sculpture.

These events did not just create a scandal within the painting world; they also moved artists in different genres to experiment with new styles. As Hansen points out, “The Post-Impressionist Exhibition certainly provided no more than a catalyst for already existing undercurrents, yet Virginia Woolf’s familiar statement that ‘on or about December 1910 human character changed’ gives us a sense of the qualitative leap that was felt” (Hansen 360). This “qualitative leap” in both method and style would eventually extend to Virginia’s own work with the publishing of her first novels a few years later.

Having created the London sensation of the Post-Impressionist Exhibition, Fry proceeded to develop his own theories on art and its relationship to real life. These views are discussed by Randi Koppen in her essay, "Embodied Form: Art and Life in Virginia Woolf’s To The Lighthouse." Quoting from Fry’s book Vision and Design, Koppen says, Fry’s theory of art...does not ‘seek to imitate form, but to create form; not to imitate life, but to find an equivalent for life’. More unexpected, however, and more interesting, is Fry’s point that the artistic attitude—the pure, disembodied vision—is conditional on forms calculated to move our emotions...making use of the emotional elements inherent in natural form: (Koppen 2)

Fry’s ideas, and the post-impressionists’ ideas, dealt with the relationship between art and real life, and how that life should or should not be portrayed. In a deviation from realism and even impressionism, post-impressionism became a more abstract form of painting, where form is
created, and the artist seeks "not to imitate life, but to find an
equivalent for life." Modern Art describes the movement as
having "the need for a more spiritual or emotional approach
in its art" (Modern Art 34). Emotion and intellect in painting
grew in importance, with the creation of feelings becoming
more important than the creation of a realist portrayal of the
world around us.

Individual feeling and freedom was also a central theme to
this movement; artist went in a number of different directions
all within the space of post-impressionism. This applied to
several members of the Bloomsbury group, as discussed in
Modern Art: "Bell and Grant adhered to a highly personal
vision, in this instance shaped more by their membership
in the Bloomsbury Group than by the latest Continental
experiments" (Modern Art 237). As a fellow member of
Bloomsbury, Fry himself also changed as an artist, moving
from a more traditional style into a post-impressionistic
style, as seen in this piece, "Winter Landscape." Fry's use of
smoky, blurred lines and a slightly twisted perspective create
a curling and shifting effect in this painting. This adds to the
movement of the painting, which is enhanced by the darker
color palette of blues and browns, creating a mood of peace
and tranquility, tinged with sadness. The light areas of the
path invite the viewer towards the house, but there is a slight
sense of foreboding when we reach the darker, gloomier
colors of the house area itself. Fry has thus taken his own
advice and used "forms calculated to move our emotions."

Woolf herself expressed similar ideas to those of Fry
several years later in her 1919 essay "Modern Fiction," where she applies
post-impressionist and cubist ideas to
writing. Like Fry's

"Winter Landscape"
by Roger Fry, c. 1910

concept of portraying emotion and intellect rather than
realism in painting, Woolf presents the idea of portraying
the mind rather than the body in literature. She criticizes
"materialist" authors who ignore the mind, asking "Is it not
the task of the novelist to convey this varying, this unknown
and uncircumscribed spirit, whatever aberration or
complexity it may display, with as little mixture of the alien
and external as possible?" (“Modern Fiction” 283) Woolf
emphasizes the fact that the mind does not work in a linear
way, and that life cannot be reproduced through description
and fact. She argues for a kind of verbal cubism, where every
angle of thought and mind is taken into consideration:

Look within and life, it seems, is very
far from being 'like this.' Examine for
a moment an ordinary mind on an
ordinary day. The mind receives a myriad
impressions-trivial, fantastic, evanescent,
or engraved with the sharpness of steel.
From all sides they come, as incessant
shower of innumerable atoms; and as they
fall, as they shape themselves into the life
of Monday or Tuesday, the accent falls
differently from of old. (“Modern Fiction”
187)

Woolf found importance in what many authors would
view as a normal and uneventful day. Her theory is that the
author must try to portray this day through the thoughts of
the characters, rather than lengthy visual descriptions. Every
fleeting and seemingly disconnected thought should be
included, and all these fragments come together as a whole,
portraying the mind and the life of that person through their
train of thought. This portrayal of the "incessant shower of
innumerable atoms" shows a strong correlation to both post-
impressionism and the more specific art form of Cubism.
Woolf seeks to portray the "unknown spirit," showing her
reader the emotion and the intellect over physical facts,
just as the Post-impressionists do through their painting.
Like the Cubist artists, Woolf wanted to shower the reader with pieces and fragments of the mind, thereby creating a pattern of thought truer to real life than that created by the "materialist" authors. Just as Picasso could give the viewer a different kind of visual experience of a guitar player by showing every angle rather than just one, Woolf could give the reader a different kind of written experience by combining "myriad impressions" rather than just a linear train of thought.

One text that exemplifies both Fry's ideas and Woolf's assertions is her novel To The Lighthouse. One of the main characters of this book, Lily, is a visual artist who employs the ideas of impressionism in her paintings. This can be seen from a passage in the book where Lily uses a non-traditional method to paint the character Mrs. Ramsay and her son James. Her painting is questioned by old-fashioned Mr. Bankes: "Mother and child then-objects of universal veneration, and in this case the mother was famous for her beauty-might be reduced, he pondered, to a purple shadow without reverence" (To the Lighthouse 52). Bankes cannot reconcile himself to accepting a purple triangle on a canvas as any kind of representation of a mother and child. Lily's reply shows the influence of Roger Fry and the Post-Impressionist school of thought:

There were other senses too in which one might reverence them. By a shadow here and a light there for instance...the question being one of the relations of masses, of lights and of shadows. She took up once more her old painting position with the dim eyes and the absent-minded manner, subduing all her impressions as a woman to something much more general...It was a question, she remembered, how to connect this mass on the right hand with that on the left. (To the Lighthouse 52)

These words echo Roger Fry's list of the necessary elements of Post-Impressionism, which include "rhythm, mass, space, light and shade, color, and the inclination to the eye of a plane" (Koppen 2). In Vision and Design, Fry connects the use of these elements to create an emotional response in the viewer, saying, "The spatial judgment is equally profound and universal in its application to life...light again, is so necessary a condition of our existence that we become intensely sensitive to changes in its intensity" (Fry 34-35). Fry does this himself in "Winter Landscape," where changes in the lighting touch the viewer with both warmth, in the lighter pathway areas, and a colder sadness, in the area of the house. Lily uses these elements of light and space to create meaning in her own composition, creating an intense "purple shadow" and connecting the "mass on the right hand with that on the left."

In addition to creating a character that does artwork in the post-impressionist style, Woolf also uses the post-impressionist and cubist styles in her own art of writing. The whole text of To the Lighthouse shows Woolf's use of verbal cubism, as she puts fragments of thought and conversation together to form one universal whole. Bell discusses what Virginia had in mind for a style, quoting from Woolf during the time in which she was writing To the Lighthouse: "Indeed it was precisely the task of the writer-that is to say her task-to go beyond the 'formal railway line of sentence'...the literary artist has to realize that 'people don't and never did feel or think or dream for a second in that way; but all over the place" (Bell 106-107). Woolf felt that she had to portray thought as it actually works, moving in circles and going back and forth through time.

This method can be seen throughout To the Lighthouse, but particularly in the dinner scene that closes the first half of the novel. In this passage, the reader is shown the interaction of thoughts and feelings between all of the adult characters. There is a lot of tension between Lily and young Charles Tansley, who believes that women can neither paint
nor write. Woolf shows this tension during the dinner scene as she intertwines two separate trains of thought, showing Lily's anger with Charles and Charles' insecurities towards women in general:

Women can't write, women can't paint—what did that matter coming from him, since clearly it was not true to him but for some reason helpful to him, and that was why he said it?

"Oh, Mr. Tansley," she said, "do take me to the Lighthouse with you. I should so love it."

...He knew that she was trying to tease him for some reason; she didn't want to go to the Lighthouse with him; she despised him: so did Prue Ramsey; so did they all.

(To the Lighthouse 86)

Rather than give us pure conversation, Woolf lets us into the thoughts of her characters, showing not only how each person feels but also how their thoughts interact with the thoughts of the others. This silent dispute between Lily and Charles continues for some time, with Charles staring sullenly at his plate and Lily distracting herself with the pattern on the tablecloth. Instead of presenting this information in a purely linear form of dialogue, Woolf gives her reader fragmented pieces of thought, with Lily's mind wandering to things said in the past and Charles' mind wandering to other women.

This style is abstract, making quick shifts from person to person and from thought to thought, but these thoughts all come together into a unified whole, just as a successful cubist painting does. We do not talk constantly throughout the course of a day, but we never stop thinking and reflecting. And these thoughts do not run together smoothly, but are confused and jumbled. They jump around and merge into something else entirely from time to time, just as Woolf's writing does in To the Lighthouse.

Post-Impressionist and Cubist elements can also be seen in Mrs. Dalloway, Woolf's novel that portrays one day in the life of character Clarissa Dalloway. Although we follow Clarissa through a single day on which she is throwing a party, Woolf actually presents her readers with thoughts and events from many different periods of time, starting far back in the pasts of several different characters. One of the interesting things about Mrs. Dalloway is that it contains the life stories of many people that do not come into actual contact with each other at any point in the book. Woolf imitates the elements of Cubism to a great extent in scenes where she brings us into the minds of each person present, whether they know or are even aware of each other. By doing this, she gives a complete picture of what is going on, just as a Cubist painter presents us with all sides of each element present in the set up of a picture.

The method of including the thoughts of seemingly unconnected characters comes into play right from the beginning of the novel. One example is a scene where a car has just backfired and the attention of the crowd is drawn towards the car. This scene shows how Woolf shifts from her portrayal of Mrs. Dalloway to that of Mr. and Mrs. Smith:

The violent explosion which made Mrs. Dalloway jump and Miss Pym go to the window and apologize came from a motor car which had drawn to the pavement precisely opposite Mulberry's shop windows...

Edgar J. Watkiss, with his roll of lead piping round his arm, said audibly, humorously of course: 'The Proime Minister's kyar.'

Septimus Warren Smith, who found himself unable to pass, heard him.

Septimus Warren Smith aged about thirty, pale-faced, beak-nosed, wearing brown shoes and a shabby overcoat,
with hazel eyes which had that look of apprehension in them which makes complete strangers apprehensive too. The world has raised its whip; where will it descend? (Mrs. Dalloway 14)

By creating a common experience, here in the form of a backfiring car, Woolf is able to draw her readers into the lives of multiple characters with differing backgrounds and experiences. Woolf forms the fragments of thought presented here into coherent meaning, giving her readers insight into the lives of both Clarissa and the Smiths.

This technique also presents itself in the work of Georges Braques, another Cubist painter who worked closely with Picasso in developing the techniques of cubism. Here, in "Harbor in Normandy," Braque moves away from realism with a limited color palette of shades of green, gray, and yellow. The pieces of the boat and its sails seen from all angles create a coherent whole: more of the boat is actually seen in this view than in a more traditional painting. Braque has also created a sense of movement and spontaneity, as the pieces of the ship progress from the background, with its buildings and presumably a dock, towards the viewer.

Woolf's stylistic device of switching back and forth from one consciousness to another also adds an element of movement and spontaneity. Jack F. Stewart comments on the common use of similarity between the visual arts and writing in his essay "Impressionism in the Early Novels of Virginia Woolf." Quoting from To the Lighthouse, he says, "Both [art and writing] aim at instantaneity, 'that jar on the nerves, the thing itself before it has been made anything'" (Stewart 237). That "jar on the nerves" happens often in Woolf's work, as it does here with the backfiring of the car. The noise it creates sets off a chain of events, ending with our introduction to Septimus Warren Smith, a mentally disturbed young man who becomes one of the major characters of the book. We are further jarred by the sudden thought we are met with, that "the world has raised its whip; where will it descend?" This is only one fragment of thought from one character's mind, but it provides insight into his character and sets the tone for the disturbing events to come in the lives of the Smiths.

Through this type of writing, Woolf is able to capture the feelings and meanings behind single moments in time and then convey them to her reader. She takes small pieces of events, like the small pieces found in Cubism, and portrays the deep feeling that results from these events, like the deep feeling and emotion that is the basis of Post-Impressionism. This happens again in Mrs. Dalloway during a scene involving Mrs. Lucrezia Warren Smith. As Rezia walks through the park, a child runs into her. This may seem like a small, unimportant happening, but Woolf shows her readers the thoughts that are started in Rezia's head because of this event:

That was comforting rather. She stood her upright, dusted her frock, kissed her. But for herself she had done nothing wrong; she had loved Septimus; she had been happy; she had had a beautiful home, and there her sisters lived still, making hats. Why should she suffer? The child ran straight back to its nurse, and Rezia saw her scolded, comforted...but why should she be exposed? Why not left in Milan? Why tortured? Why? (Mrs. Dalloway 65)
Having a little girl bump into a character and then fall down may not seem like an important event in a piece of literature, but such small events have more meaning than it first appears. Seeing the small child given comfort reminds Rezia of the comfort that she has given her own husband, and of the comfort and love that she lacks in her own life.

Finding the importance in such small events is discussed by Stewart: “As a writer, [Woolf] aims to render the feel of life in a given consciousness at a given moment, through a language of sense perception that parallels that of paint” (Stewart 238-239). Portraying the emotion behind a single moment in time is a key element to Woolf’s writing, just as it is in painting. Stewart links this word artistry specifically to the concepts of Roger Fry and his contemporaries, saying, “She saw the design of her novels of the twenties ‘chiefly in terms of an analogy with painting, precisely with impressionist and post-impressionist art. Her ‘paintings’ were visual illuminations...artistic equivalents of the recognition of the moment’ (Stewart 239). A painting portrays a single moment in time, rather than a long series of events; therefore, it has to convey the importance and feeling of that moment to the viewer. This is what Woolf does with all of her scenes throughout Mrs. Dalloway, showing the many sides of many people throughout the course of many years, all within the set up of a single day in one woman’s life.

Woolf’s sister Vanessa Bell also used this technique of finding importance in small events and individual scenes in her own work, as seen from her portrait of Woolf’s husband Leonard. This painting on the surface simply depicts Leonard at work in his office. But there is more to this painting than that; Bell has created a snapshot of Leonard not simply engaged in work, but in the passion and life’s work that was his writing. Bell does not do this realistically, but uses thick, blurred brushstrokes, with a sense of movement and gesture that borders on caricature. Bell created a greater meaning out of one simple scene, just as her sister Virginia created a larger meaning out of a child running into a woman at the park.

Woolf’s skill at verbal cubism is perhaps at its best in her novel The Waves, the story of six childhood friends, Bernard, Neville, Louis, Susan, Jinny, and Rhoda, as they move from childhood into adulthood and then into old age. The novel starts when the characters are only around five or six years old, yet they are speaking in adult language:

’Suddenly a bee booms in my ear,’ said Neville. ‘It is here; it is past.’

‘I burn, I shiver,’ said Jinny, ‘out of this sun, into this shadow.’

‘Now they have all gone,’ said Louis. ‘I am alone...My roots go down to the depths of the world, through earth dry with brick, and damp earth, through veins of lead and silver. I am all fibre.’ (The Waves 11-12)

In this passage, Woolf gives her reader an abstract picture of the childhood of these characters, both in terms of language and style. Small children obviously do not use the sort of language seen here, but Woolf uses this type of language for the characters throughout the book, creating a unique style of expressing thought. The whole book contains these sections of text, clearly labeled as being the thought of a particular person, with only a few pieces of dialogue from the six main characters and no thoughts or words whatsoever from any other characters. The Waves
shows the extent of Woolf’s verbal cubism, as she not only presents her readers with fragmented pieces of thought, but presents the thoughts of six different people simultaneously, mirroring the simultaneous thought among people that occurs in reality.

This portrayal again echoes the ideas from “Modern Fiction,” where Woolf pointed out, “Life is not a series of gig lamps symmetrically arranged; but a luminous halo, a semi-transparent envelope surrounding us from the beginning of consciousness to the end” (“Modern Fiction” 285-286). Woolf creates this “luminous halo” in The Waves, as she blends the minds of all six characters together; this method shows the relationship that exists between her characters and the importance of that relationship to their growth as people. This relationship is the subject of the last portion of the novel, where we are only met with the thoughts of Bernard: “And now I ask, ‘Who am I?’ I have been talking of Bernard, Neville, Jinny, Susan, Rhoda, and Louis. Am I all of them? Am I one and distinct? I do not know” (The Waves 288). Bernard seems to be the only one of the group left for this final part of the novel; without the others he is no longer sure of his own identity. He cannot be sure if he is indeed Bernard or if he has transformed into a combination of Bernard, Neville, Louis, Susan, Jinny, and Rhoda. In this verbal painting, Woolf has used the emotional connection between six people to form a composition where the separation between people becomes ambiguous, based on thought and feeling rather than realism.

Woolf also emphasizes the simultaneous aspect of these six characters in the introductions to each section of the book. These opening passages are pictorial descriptions of nature, specifically the sun and waves rolling in from the ocean. The novel opens with a description of waves forming in the water: “Gradually as the sky whitened a dark line lay on the horizon dividing the sea from the sky and the grey cloth became barred with thick strokes moving, one after another, beneath the surface, following each other, pursuing each other, perpetually” (The Waves 7). Using this imagery of waves reflects the Post-Impressionist theory of art; this representation of people as waves is based on “the emotional elements inherent in natural form” that Roger Fry incorporated into visual artwork. Both Woolf and the Post-Impressionists used this type of imagery as their own creation of life, as discussed by Koppen: “Fry’s art, then, and by extension Woolf’s, is ‘transformational rather than representational’” (Koppen 1). By both giving a visual description of waves as symbolizing her characters and showing all six trains of thought inseparably and simultaneously, Woolf has found “an equivalent for life,” rather than given an imitation of it (Koppen 1). She has transformed the idea of waves into a method of representing the ever-changing state of human life itself, as each human life washes up on shore while another wave forms farther out at sea.

The similarity of Woolf’s ideas to those of cubism can be seen by comparing the natural imagery from The Waves to the image shown below: “Nude Descending a Staircase” by Marcel Duchamp is an example of a figure in motion, where the viewer cannot be quite sure if this is just one figure or multiple figures moving together down a flight of stairs. This joining of separate human forms is much like Woolf’s six characters in The Waves that are joined in thought and feeling.

“NUDE DESCENDING A STAIRCASE” As Virginia Woolf observed at the time, human character changed in 1910, when the Post-Impressionist Exhibit caused a creative leap in British society. Roger Fry and the Post-Impressionists perfected a new kind of art, one where emotions were placed above visual fact; the Cubists formed a type of art where all angles of a subject
are deserving of equal consideration. Their influence was felt by fellow artists; these artists included both painters, such as Clive and Vanessa Bell, and writers, such as Woolf. Woolf created her own theory of writing similar to Fry's theory of art, expressing them in "Modern Fiction" and then putting them to practice in her novels. *Mrs. Dalloway*, *The Waves* all show Woolf's use of Post-Impressionist and Cubist elements in their innovative treatment of the portrayal of the human mind and emotions. The fragmented pieces of thought come together into a unified whole, showing the reader, not a "series of gig lamps," but a "luminous halo" representation of life.

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**Works Cited**


Inherent Instability: Disproving Luttwak’s Thesis of Defense in Depth

BY ADAM STILGEOE

This paper is chiefly designed to illustrate the fourth century Roman defense in depth model of border protection with regard to the Eastern part of the Roman Empire. While several models of defense in depth with regard to the Roman Empire exist, I have chosen to utilize Edward Luttwak’s book *The Grand Strategy of the Roman Empire* as representative of Eastern Roman defense in depth during Constantius’ and Julian’s reign from 353 to 363 C.E. I have paid particular regard to fortifications and the use of artillery, as they are most often mentioned in Ammianus Marcellinus’s surviving histories and other primary source documents and are integral pieces of an effective border defense. The second part of this essay is a critique of Luttwak’s description of Roman border defense through the lens of primary source documents, as his thesis and the texts of ancient authors differ in several key points. In particular, Constantine’s movement of troops from the borders to a mobile, standing army is misrepresented in Luttwak’s work and needs to be corrected.

Luttwak’s thesis on Roman border defenses offers two examples of standard Roman practice in the East, and elsewhere. The Western borders are a topic in their own right that will not be addressed in this paper. There were two kinds of defense available to the Roman emperors during the latter half of the fourth century: an elastic defense and a defense in depth. An elastic defense had no fortified perimeter; instead the defense relied on mobile forces, comprised of both infantry and cavalry that could meet the offense head on, as long as the defense was at least as mobile as the offense. This strategy acquired the benefit of not needing to assign troops to hold fortifications, and therefore not needing to send troops stationed at peaceful borders elsewhere in case of a military emergency; conversely, it sacrificed the inherent advantages of defending a fortified, fixed position, although the defense could still defend territory that it knew relatively well.
The defense in depth model is slightly more complex. It is based on "self contained strongholds with mobile forces either between or behind them," whereby the mobile forces in reserve and the fortifications act in concert. If the strongholds could successfully withstand the offense without requiring assistance of the mobile reserve, if the mobile elements did not need the fortified areas to survive an encounter with the enemy, and if the invading army needed to destroy the fortified areas to continue, then it was a successful use of the defense in depth military method. Not only cities would be fortified; granaries, villas, towns, villages, and defensive positions all acquired fortifications in which townsfolk or whatever bands of soldiers were handy could defend themselves; food could also be stored in such enclosures and supply lines and roads could be protected through the use of this fortification system. Mention in a surviving document pertaining to Constantius' actions regarding the supplying of forts and fortified towns in Syria is also made, stating that, "The cities of Syria you stocked with engines of war, garrisons, food supplies, and equipment of other kinds, considering that...you would...sufficiently protect the inhabitants." An invading army would find its supply lines cut off by bands of roving soldiers that had taken shelter in fortified camps or towns and were now ravaging the army's rear; if the army ceased moving towards the interior and attempted to deal with the city it lost valuable time, supplies, and men, in turn giving the mobile Roman army time to counterattack as it marched from its position somewhere along the Mediterranean, generally at or near Italy. The existence of extensive fortifications also allowed the mobile reserves to retreat behind high walls in the face of defeat, and for intelligence to be gathered about enemy movements from the rear.

Because fortifications played such an important role in the defense of the Roman Empire their improvement became mandatory as time went on. After the end of the third century Roman forts began to take on characteristics that made them distinct from their predecessors. First, forts began to be built on different sites; rather than attempting to merely look impressive, forts were constructed less for ease of travel (i.e. near roads) but instead for tactical dominance. In particular, there was a concern for easily defensible terrain; forts were often placed on hills, or near areas that were otherwise easily defensible, with rivers being a chief commodity in fort building. Forts also acquired different shapes; instead of the older rectangular shaped forts with a circular ditch defense, forts became irregularly shaped quadrilaterals or ovals, or squared, with the advantage becoming that of a shorter distance for soldiers to move about the top of the wall. Walls were thickened, as were ditches, to keep battering rams and other siege engines away from the walls. Luttwak's explanation for the sudden increased effectiveness of Roman fortifications goes against what he says is "sometimes suggested". He believes that fortifications were not improved because the armies threatening Rome suddenly developed better siege equipment, but were instead produced precisely because the armies threatening Rome had not produced such equipment at all. It should be noted that his primary interest is in the barbarian armies of the West, and reference is made to the Persian armies having advanced their siege making technology, although little more is said than that they had it.

Another chief component of the defense of Roman fortifications is that of artillery. Artillery was no longer part of a Roman legion's auxiliary forces but was instead placed in fortified areas to help with defense. Luttwak suggests that with the formation of wider ditches came the use of artillery to keep attackers away from the walls; with the attacking army stranded on the wrong side of the ditch ballistae and catapults could rain fire down upon them at will. Artillery, according to Luttwak's model, was designed to "hold the attackers in an outer zone that could be covered by overlapping missile fire" and "could not be sharply angled, [and] their fire could not be
directed down at attackers close to the walls.\textsuperscript{20}

The final component of Luttwak's thesis that needs to be addressed is his depiction of Constantine's removal of provincial garrisons to supply a mobile Roman field army that could come to the rescue of embattled garrisons in the East. "It is apparent," he states, "that reductions made in the provincial forces that guarded the frontiers in order to strengthen the central field armies...must inevitably have downgraded the day-to-day security of the common people."\textsuperscript{21} Luttwak draws this conclusion that "Diocletian...created or expanded the sacer comitatus..., replacing the improvised field forces of their predecessors with standing field armies and creating the dual structure of static border troops...and field forces...that characterized the army of the late empire", and that Constantine merely refined this method of defense.\textsuperscript{22} He goes on to say that the stationing of the II Parthica near Rome and the three Severan legions being commanded by the equestrian class made the foundation of this new "central field army" less of a military construction and more of a political one.\textsuperscript{23} This force was substantially increased by Constantine's time, with 23,000 men out of up to 30,000 being ready for active campaigning, leaving only seven thousand for border defense.\textsuperscript{24} Constantine increased the size of the field army, but as there were no new resources for the empire to draw from, it seems likely that these troops were taken from provincial garrisons.\textsuperscript{25} This leads Luttwak to the aforementioned conclusion that the safety of the empire was drastically reduced because of troops being moved from fortifications in the defense in depth model to stations within a mobile field army used primarily to keep the emperor in power and only secondarily as a military tool, a move for which Luttwak feels Constantine is "rightly criticized"\textsuperscript{26}. By the time of Constantius, with which this paper is primarily concerned, the defense in depth was so deep that only Italy could rightly claim to be held, and then only because the mobile reserve was deployed there; everything else was a network of fortifications designed to slow down the enemy while the mobile reserve, mainly cavalry, could march to meet them.\textsuperscript{27}

During the invasions of Shapur II Ammianus Mercurinus recorded the military movements on the Eastern front at the time, with particular regard to several fortified cities and towns and the devastating effect Shapur's army had upon them. These descriptions of events also detail how well the defense in depth model worked at the time. The first town in his path was Singara, "abundantly fortified with soldiers and with all necessities", a fact which seems to contradict the idea of garrisons being fatally weakened by the formation of a larger mobile reserve, at least in the minds of the Roman intelligentsia.\textsuperscript{28} Upon the sighting of Shapur's army, the defenders retreat inside Singara, but strangely "full of courage ran to the various towers and battlements and got together stones and engines of war"\textsuperscript{29}. In order for a defense in depth model to be successful, the attacker needs to deal with a fortification, buying time for the mobile army to counterattack. Yet it seems strange that Shapur II, fresh out of Persia with an enormous army, should attack the first heavily defended fortified town he sees, especially one defended valiantly by "townsmen."\textsuperscript{30} The casualties were heavy on both sides. The town housed two of the smaller legions of the time, the First Flavian and the First Parthian, yet "the greater part of the army was in camp guarding Nisibis, which was a very long distance off...[and] all the surrounding country was dried up from lack of water."\textsuperscript{31} This implies three things. Firstly, should Shapur II have left the defenders of Singara behind him, it is unlikely that he would have to fear an attack in his rear, as it was guarded by a desolate wasteland where no water was to be found, thus eliminating one major advantage of the defense in depth model. Secondly, if the greater part of the Roman army was at Nisibis, in light of the defense in depth model it makes little sense for Shapur II to waste such a significant part of his manpower taking a city that, as has been said, posed little threat to his rear, while a much larger and more dangerous force was still in front of him. Finally,
the Roman fortifications seem to have had little effect upon the Persian military. Ammianus claims that the Persian ram’s effectiveness was largely due to its “penetrating the joints of the new laid stones, which were still moist and therefore weak” where the city had been breached previously.32 But the first breach of the walls occurred in 348 C.E., and Shapur II’s invasion was twelve years later; it seems unlikely, then, that the walls would still be so freshly made that a ram would have such an easy time of bringing them down.33 This lends credence to the idea that Shapur II’s army had siege equipment that Roman fortifications couldn’t handle, either because the fortifications were faulty themselves or the Persians had developed siege equipment superior to them, a theory that will be explored later following several other primary source documents.

The next city to be attacked was Bezabde, a “very strong fortress” that was situated on a relatively large hill and next to the banks of the Tigris river.34 This fort had a wide trench and a double wall where it was most vulnerable to assault by enemy siege engines and infantry.35 Bezabde was equipped with artillery as well, in lieu of its importance as a military fortification.36 The Persians do not seem to have been deterred by the ditches, as their archers were able to move close enough to the fortress to rain arrows down on the defenders as they prepared to repulse the attackers.37 However, despite the close proximity of the archers, the defending artillery wreaked havoc among the attacking forces regardless of their positioning, even driving off siege engines perilously close to the walls.38 This goes against Luttwak’s thesis that artillery was only useful when the enemy was on the other side of the ditch or ditches surrounding the fort, and instead was effective against the enemy no matter where they were. Again the Persians succeed in taking Bezabde through the use of a ram, and again Ammianus mentions extenuating circumstances, with a Christian priest supposedly conveying to Shapur II information concerning where the walls were weakest.39 Though he claims to have his doubts, Ammianus doesn’t specifically deny this rumor,60 lending further suspicion of the effectiveness of Roman fortifications and the superiority of Persian siege engines. The ditches and double wall seem to have had little to no effect, and the Persian army, though doubtless exhausted from the long journey from Singara and anxious about the closing winter season41 seems to have had little trouble rampaging unchecked through Roman territory; no mention of harassment tactics concerning the Persian supply lines is made, and the mobile Roman army is conspicuously absent from the proceedings. In the East, then, the Roman defense in depth model seems so far to be a failure.

With the death of Constantius Julian took the throne and in 363 C.E. invaded Persia with the mobile field army, only a few years since Shapur II’s invasion of Roman territory in Mesopotamia. He assembled the army and “hastened to invade the enemy’s country, outstripping the report of his coming.”42 Upon the Roman army’s arrival in Assyria they confronted the Persian fortress of Anatha, captured it through the Persian’s surrender, and burned it to the ground immediately afterwards.43 This tactic is repeated several times, with several abandoned forts and a major fortress, Pirisabora, all being captured and burned to the ground, and their populace taken away as slaves.44 Maiozamalcha is also captured and destroyed45, and the capturing and burning of fortifications and cities continues until Julian is defeated at Ctesiphon.46 The *Chronicon Ps.-Dionysianum* says that, “Julian descended into Persia and devastated the entire region from Nisibus as far as Ctesiphon in Bet Aramaye. He took a large number of captives from there.”47 Eutropius also mentions that “Several towns and fortresses of the Persians he induced to surrender, and some he took by storm... [He laid] waste to Assyria.”48 Julian’s army and methods of attack were remembered in several places, then, as being incredibly destructive and thorough; nothing of any military or civilian value, it seems, was left intact.
At this point Julian and his army were deep inside Persian territory. The role of Luttwak's mobile reserve army in the defense in depth model plays little part here. Instead of a reactionary tool designed to repel invaders and to secure the embattled frontier zone, the mobile reserve instead takes the fight to the Persians, assaulting towns, cities, and forts with equal vigor in an effort to literally wipe out areas of possible resistance. Soldiers and townsfolk are slaughtered or taken prisoner and sent west, and the forts themselves, rather than being saved for Roman use, are destroyed, to be used by neither side. Luttwak's statement that Constantine is "rightly criticized" for weakening border defenses seems amiss in light of Ammianus' histories. The townsfolk of Bezabde, Singara, and other perimeter fortresses seem to have been able defenders, taking a heavy toll on Shapur II's army, and the defense in depth model seems to clash with the preferred method of Persian warfare. Rather than ignoring the fortified towns and smaller fortresses in his path, Shapur systematically destroys all of them, just as the Romans did when Julian invaded several years later. As Blockley puts it, Constantine's adoption of a major mobile reserve is not to be criticized but instead should be seen as "an instrument of a policy that was militarily and politically aggressive" his strategy that of "a harder counterstrike into enemy territory as a prelude to a settlement." Julian obviously used the same basic strategy of destroying enemy assets in Persia to assure compliance with Roman wishes, though the outcome was not entirely favorable to the Romans in the end. Luttwak's thesis, then, with regard to the East, is not fundamentally sound. Shapur II and Persia's armies in general cannot be said to have found Roman fortifications intimidating, even when they were heavily improved, as in Bezabde. Likewise artillery, though only used in defensive emplacements, was not restricted to keeping the attackers beyond the defensive ditch found at many Roman fortifications, but instead could and did fire upon attackers and siege equipment very close to the walls. The mobile reserve was not mobile enough to support defense in depth in the East. Shapur II invaded, sacked two cities, and nearly had time to annihilate a third, while Constantius mustered his troops. While a defense in depth model attributes success to an attacker having to annihilate fortifications, the Roman defense of Mesopotamia during Shapur II's invasion can hardly be called successful. Likewise it seems fortifications behind Shapur II's lines had very little effect in terms of defensive strategy, as Ammianus' works seem to suggest. And most importantly, the criticism of the mobile field army being increased at the diminishment of the border defenses seems to be entirely unfounded when the army itself is regarded not merely as a military tool but also as a political and diplomatic one. While Luttwak's thesis has many strong points, its overall defense brings to mind the rotted walls of Singara. Several key elements are founded on faulty evidence which render the entire fortification, if you will, unsafe for defenders.
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Cambridge Rocky Horror: A Tale of Silk, Silliness, and Sexual Shenanigans

BY ROBERT J. CANNATA

approaching the midnight hour, Harvard Square becomes leaner, though not losing the energy it thrives upon. The shoppers and tourists have scurried home hours ago, leaving fragments of food wrappers, ATM receipts, and Daisani bottles in their wake. This is still the People’s Republic of Cambridge, and on a chilly Saturday in November the Ivy League proletarians reclaim their boroughs. Outside a café, Harvard lawyers and MIT programmers in London Fog peacoats huddle around steaming lattes, waxing political, philosophical, or inane over unused granite chess tables. Police officers patrol with a relaxed air (this ain’t Dorchester, after all), their insignia shining orange in the pale street lamps. Late-night commuters sprint home toward the Red Line subway as it rumbles in beneath their feet; but for a handful of bars and coffeehouses, Cambridge, like Boston, has an early bedtime.

But leave the station, the Harvard bookstore, and the shopping drags behind and turn a left down Church St.: you’ll find the mice stirring. While children of international affluence sit two blocks away, wrapped in cashmere scarves and Lycra gloves, local kids with South Shore accents stand with ironic grins outside the Loews Theatre, unfazed by how little their fishnet shirts, cheap plastic bodices, stiletto heels, miniskirts, and choke collars protect them from the blustery winds. Nevermind what the girls are wearing. They group together in tight circles in a long line, pressed up against a plain brick wall. An empty church and the houses of some very tolerant people line the opposing street. As always, parking is terrible in Cambridge and cars line the entire drag. But the kids don’t stray far from the ticket line, waiting for the front doors to open.

A woman in her mid-fifties gives me a half-annoyed look as I ask for a ticket. She’s heavy-set, missing two top teeth, and wears too much makeup in
an attempt to cover up the sagging skin under her eyes. Her Loews Theatre polo shirt is a faded navy blue and a size too large for her. She snatches my $8.50 with a quick jerk and slides my change and ticket under the bulletproof glass with a dismissive air. She does the same for three other customers before she returns to a paperback novel. I don’t make out the title, but the silhouettes and glistening knife on the cover lead me to assume it’s a murder mystery.

A sample of our cast against the wall: the majority of the patrons are in their late teens and early twenties, but I notice five or six in their thirties. The talk is largely juvenile and sexually frank: I hear more about “money shots” while waiting in line than I ever needed to. The colder weather has driven the majority of the fifty some-odd patrons to bundle up a bit. There are fewer extreme costumes than I’ve seen in the past, but I attribute this to the time of year: the last week was the Rocky Horror Halloween show, which brings out the greatest numbers. So, most of the “lifers” are probably taking the week off. Still, about fifteen people are dressed up in the signature Rocky garb.

Specimen #1: A young man of about seventeen years. He’s Caucasian—as was almost all of the group, the largest minority being Asian—and about 5’8”, thin build. His hair is a dark black, but I suspect it’s dyed, though his eyebrows are very dark as well. The hair is medium-length, but spiked up with high-hold gel or glue. He has a bright red face-painted on his right cheek. No other make-up. He’s wearing a black leather collar with small, shiny spikes. His thin build is draped with a black mesh shirt which clings around the chest but goes loose at the arms. When not playing with his nipples (it’s cold tonight), he encourages others to do so, especially the girls in his clique. After two takers and six rejections, he gives it up. He also has a black leather bracelet on his left wrist. He’s wearing a black belt that holds up a pair of black raver pants: long, loose, and covered with clip-on watches, chains, keychains, and other shiny objects. His sneakers are blue canvas Converse All-Stars.

Specimen #2: A woman in her mid-twenties, she is also Caucasian, about 5’4”, of a medium but stocky frame, and has shoulder-length, wavy auburn hair. She is wearing large, elaborate earrings that dangle from her ears in a tassel of small glass beads. Her face is plastered white with dark eyeliner. She has a small nose ring. She is only wearing a lacy red bra and a tight black miniskirt. Her shoes are bright red heels with a pointed toe. Her crescent moon tattoo, located in the small of her back, is visible. She’s smoking a pack of cloves and talking to her small coterie, four others about her age, in quieter tones: the usual gossip about absent friends and enemies.

Specimen #3: A professional lifer. A Caucasian man of about 25 years, he towers over the rest of the audience at around 6’6” and has a thin, athletic build. He has mid-back hair that falls naturally in golden ringlets—real deal here, not a wig. He is wearing a dark navy dress that clings tightly to his frame, and shows about 70% of his back. It tapers to just below the knee, with a small slit on the left-hand side. He has somehow simulated about a small B-cup underneath the dress, and has shaved all hair from his armpits, back, legs, and stomach (you can see the sides of his abs). He is wearing black heels and walks in sheltered by a black faux-fur overcoat. Except for his height, his voice, his stature, and his strong jaw, you would easily mistake him for a woman—and a fairly attractive one—on the street.

Specimen #4: Yours truly. I’m a 5’10” Caucasian male, a lithe 165 lb. My eyes are blue, and I have toast-blonde hair that’s gelled into a cross between punk spikes and the ‘do sported by the singer from A Flock of Seagulls. No face paint, earrings, or otherwise. I’m wearing a black mesh shirt that clings tightly to my biceps and chest, but over this I’m wearing a black woman’s top made of a tight synthetic. It slopes considerably off the shoulder, and instead of a sleeve on the right-hand side, it has a leather strap and buckle. I’m wearing a short red-and-black plaid miniskirt, and haven’t learned to sit like a lady quite yet. As an accent, I have a
pair of novelty handcuffs clipped to two safety pins running through my skirt. I'm also wearing a black leather choker and a matching leash. I have two black knee-highs hiked up, and am wearing them over a pair of black leather combat boots.

I am quite a fancy, fancy boy.

Now let me get a few things straight. This is not a hobby. This is a study. And as absolutely hot as I look in my Rocky outfit, I'm far more likely to be found in a corduroy blazer with elbow patches than a fishnet shirt. Which makes it curious that I would get into this sort of thing. Well, close friends might not balk, but casual acquaintances would be shocked. But despite my Clark Kent day-to-day facade, I get a kick out of it. It plays with so many social roles. And, well, it's another experiment in identity, and if history is a guide, I can't keep away from those.

The parallax of public and private identity has always interested me, and even as a child I was intensely aware of the lenses around me. Even as far back as second grade, I would start fights and shift facades to escape the chains of nerdiness that rattled on my leg. Depending on where I was in life, I found new challenges and would try to adapt myself to them as they came. As a result, I've gone through a myriad of phases in a relatively short period of time.

The phases were many and diverse once I hit middle school. My cousin Ricky was the closest thing to a sibling I ever had, and his intense interest in sports became a focus of my young life. We were always decked head to toe in sports gear, but not of the home teams. No, that was too obvious. Only true aficionados like us would sport Florida Marlins gear during a blistering Massachusetts winter. A few years later, I immersed myself in martial arts. I wore a gi around the house. After that, it was military haircuts, collared shirts, and camo. I joined a military youth group and started planning to join the Air Force Academy. Until I grew disenchanted. Which lead into shabby band t-shirts and ripped jeans. And then silk Hawaiian shirts with corduroys. On and on and on.

The current phase? Metrosexual meets stuffy English scholar. Wait two more years and we'll see where else I end up.

Rocky Horror has taken on a special significance, however, because it focuses on two issues I have always found fascinating: sexual expression and gender roles. The reasons for sexual interest are...well, I'm a twenty-one year old male. The interest in gender roles requires a bit of explanation.

My father worked, and still works, long hours as a self-employed carpenter. Leaving at dawn, he'd often commute two hours up to more lucrative jobs in Newton, work twelve hour days, and drive back. At times I'd go five days without seeing his face. After all, we had a house to sheetrock, trim, and paint. I would never complain about or disrespect this sacrifice. The facts of the situation are this, though: without a brother to emulate, a sister to foil against, and without a lot of paternal guidance, and I was raised by my mother's exclusive example. As a young child I was notably feminine: mild-mannered, shy, and more prone to a quiet cry than an angry tantrum. Not that girls don't throw tantrums, but mine were less prone to violence and throwing things around than most boys. As adolescence approached, however, I realized that I would have to change to have a fighting chance out there. I took it upon myself to establish, by trial and error, a theory of masculinity.

From military hypermasculinity to sports fanaticism to my current flirtation (pun intended) with metrosexuality, I have spent a long time charting the waters of manhood and the thousands of expressions therein. What values are men expected to uphold in society, and how do they? How deeply do the social constructions of men's fashion, humor, attitude, and behavior connect to these values? And at base, how does the modern man balance his individualistic leanings with the social expectations of his gender?

Considering how often I kick these things around in my head, the chance to dress in drag and scream sexual innuendo in a crowded theater was appealing. What makes a kilt okay, but a plaid miniskirt not okay? Why are skin-tight
t-shirts okay, but showing a lot of collarbone taboo? Also, were there any rewards for acting this extremely? Although the cross-dressing men are the stars of the circus, there's an equally valid question to ask about the women: screaming sexually-charged jokes and commentary is primarily the domain of men, and drunk men at that. By displaying this sort of sexual aggression, what were the women getting out of the experience?

I can't exactly answer all of these questions yet, but it was with this inquisitive frame of mind that I approached the Rocky Horror experience. So let's go through a night at the theater and find out what makes men women and women randy.

After a few minutes of waiting on the street, a large Caucasian woman in her late twenties comes out of the theater, wearing a black shirt labeled "SECURITY." She wears round glasses, but is still intimidating and forceful and she paces up and down the line, sizing up the members and making crude jokes. She checks purses and bags, and goes over a few fire safety and "me-not-kicking-your-ass-safety" rules. She parries sarcastic comments with a forceful but good-natured wit. A few of the troupe actors come outside to help her, and after the briefing the crowd is let in.

We're hustled into a movie theater near the front of the complex, but I escape quickly to the bathroom, where I am privy to two men talking about a Bruins game as they apply black lipstick. The lobby is shaded in deep reds; it looks worn and about a decade since the last renovation. Still, everything is functional and the lighting is decent. The crowd pushes into the theater, making crude jokes and the occasional yelled obscenity. The pattern of reds continues in the theater—it's a plain movie theater with about 150 seats: a long, thin rectangle. The sound system is passable, but not the best the building has to offer. Dimly-lit sconces line the room as people take their seats: the aficionados get right up front. There is, however, a contingent of anti-front-row troopers that plop in the rear of the theater by the lighting table. The virgins, the regulars, and the innocent bystanders filter into the middle, usually towards the front.

SECURITY girl waits for the majority of people to be seated before calling out to the crowd again. She reiterates a few brief points, and then introduces a Rocky centerpiece: the Bag of Shit. For just a dollar, the interactive Rocky experience can be yours, hidden in a little brown lunch bag filled with, well, Shit: noisemakers, a bag of rice, toilet paper, candy, a straight flush, and a party hat. The Shit is what inspires the audience participation that makes the Rocky experience what it is. At specific points during the movie, you'll be expected to throw rice, don your party hat, and play with your noisemakers. The Cambridge Shit is fairly limited: more accepting theaters allow water pistols and buttered toast projectiles, among other things.

Once everyone has bought a bag of Shit (it's not really optional—if you don't buy a bag, you'll be singled out by the cast and targeted by the audience) from the Shit Girl and Shit Boy that work the aisles, the crowd settles in. Some virgins distinguish themselves by playing with their noisemakers or putting on their party hats immediately. The lights dim, and a spotlight fires up in the back of the theater. Like a black leather beacon, Dr. Frank N' Furter (or his facsimile) appears before the crowd in a black wig, boa, corset, heeled boots, and garter belt. The crowd goes wild. The Queen introduces himself, with a few wisecracks made from the regulars along the way (Frank: "Thank you all for coming tonight!" Regular: "I came twice!" Frank: "Jesus Christ! You've only been here for five minutes!").

Frank says his piece, and then the sound system fires up for the warm-up, or the beginning of the foreplay. "The Time Warp." A cheesy rock number created specifically as a play on campy, pre-made dances like "The Electric Slide," "The Time Warp" dance is simple enough that it can be done in the aisle of the theater. And obviously, it is. Usually there are about thirty takers per show, with a lot of surprised
Drag queens, norms, and the else wise scantily-clad pour into the aisle and line up. Upon the instructions of the song, “It’s just a jump to the left / And then a step to the right.” Done and done. Then it gets tricky. The song goes, “Put your hands on your hips” and the crowd echoes “Or somebody else’s!” and they all reach forward and hold the hips of the person in front of them, stranger or friend. The song continues, “And tuck your knees in tight. / But it’s the pelvic thrust / That really drives you insane.” At this point, the entire line becomes an undulating, connected pelvic thrust, swaying in one big, goofily sexual motion. Several dancers will call out orgasmically, or chant “Groupsex! Groupsex! Groupsex!” in time with the music until the thrusting is over. The chorus finishes “Let’s do the Time Warp again!” and the crowd echoes “And again and again, fuck your mother!” before crashing to the floor for the next verse. They harmonize, make up lyrics, etc. During a tap dance sequence, to fill the void in vocals they’ve even made up a collective verse based on the song “Shake Ya Ass” by Mystikal: “Shake that ass / Watch yaself / Show me what you’re workin’ with. / Danger! Danger! / 2-4-6-8, Show us how you masturbate! / 3-5-7-9, You know you do it all the time! / 1-2-3-4, Get your ass up off the floor!” until the chorus comes around again.

All this is meant to startle the virgins, and explicitly state what the night is going to be like. Also, it encourages more people to join in the dance when the song comes on later during the movie. Still, there is a gradual progression of sexual banter and build-up that’s meant to loosen up inhibitions before the movie starts.

I am not known as an extremely inhibited person. Twice in my life, I have worn nothing but a pair of Santa Claus boxer shorts, a Santa hat, boots, and a smile around my college campus in the dead of winter as a joke. Still, I have to admit that the Rocky festivities at first put me off. I was nervous and prudish enough to not partake in the Time Warp on my first visit, and even skipped out on the virgin ritual (which will be explained later). Walking into a room full of drag queens for the first time isn’t necessarily intimidating--it’s disorienting. One doesn’t really know what to expect, which is scarier than a sure, known evil. The lifers, who know the program by heart, don’t offer much of a clue, too wrapped up in their insider conversations and blatant misconduct. Unless they have friends willing to guide them, virgins are left on their own. And it’s the tension of the virgins that this show feeds on, and the gradual “loosening” of the virgins is the aim of the first twenty minutes.

Next comes the pre-show, which varies and changes every three to five weeks. December means a Christmas theme, and Halloween played a prominent role in October. In November, however, we were treated to a more usual pre-show. The first act consisted of three men dressed in prison uniforms with mops, swaying back and forth to a ’50s rock ballad parody entitled “Prison Bitch.” They lip-sync a sort of chorus before the spotlight lights up two other men in prison uniforms who play the leads of Butch and Bitch in the song. Prison rape isn’t a very laughable topic, but the extremity and parody of the situation makes it humorous for the purposes of blowing off steam. Plus, the already uninhibited laugh ludicrously, exonerating the more reserved to do likewise.

The first show tends to follow the theme of the sexually abstract joke: “Prison Bitch” is bizarre enough to get most people to emit a nervous laugh or two. Likewise, other first shows have involved lap-dance auctions and, at my virgin show, a series of juvenile, dirty ten-second jokes and skits centering around sexual themes. By drawing humor out of sexual deviation, the cast and audience put newcomers at a sort of ease, showing that, at very least, the culture has a sense of humor about itself.

When that’s finished, another song chimes on entitled “I Know What Boys Like” by The Waitresses. It’s a poppy song, and three male actors stand dumbfounded at the front of the theater. Three female actresses lip-sync while basically doing a minor striptease to each of them, pushing their advances
away coyly. It gets fairly hot and heavy towards the end, until Frank N’ Furter walks out during the last verse, holding hands with the golden-thonged Rocky and lip-syncing. A bit of molestation happens, and all the women (and Frank) end up respectively bending over their men and spanking them until the song ends. The crowd, expectedly, goes wild again.

While Frank and Rocky act as the punch line in this song, the majority of the song is more seductive than funny—it releases the exhibitionist proclivities of the established culture in a bit of a rawer form. Cat-calls and wolf-whistles abound, and the atmosphere communicates a randy building of tension instead of a comic release. A tension which is soon capitalized upon.

Lastly, there is the most sacred ritual of all. The Popping of the Virgin Cherry. In all Rocky theaters, this ritual is uniform and taken with utmost seriousness and passion. A “virgin” is, expectedly, a person who has never seen the show—not the movie, the show—before. They are called to rise—maybe 40% actually do, the rest are often coerced by friends or cast members—and the most innocent-looking and guilty-looking are chosen. The Chosen Ones are lead to the front of the theater, and Frank asks for names, introducing them all to the audience.

Sometimes the cast is a bit sneakier in catching the shy virgins. Frank N’ Furter once asked the entire audience to rise. He went sequentially, asking people who’d seen 50 shows to sit down, 20 shows, 15 shows, 10, 7, 5, 4, 3, 2, 1, and finally none. Only then did the virgins know that they’d been cornered, unprompted and unable to escape Frank’s roving eye. Those who dress up are likely to be picked from the herd, especially the more attractive and scantily-clad. This is all about mob rule and entertainment. Second to the exhibitionists are the norms—the girls in gray sweaters who cling to the armrests of their chair as Frank approaches, the jockish guys wearing baseball hats and nervous smiles. The audience seems to delight in the contrast, and likes to be constantly reminded of their own surreality. Plus, as one Rocky kid noted, “innocents make the best faces.”

The virgins are lined up at the head of the theater, girls on one side, boys on the other. This is to encourage the sort of homoerotic behavior the crowd adores. One by one, Frank—petting and feeling as he goes (he spent almost thirty seconds playing with my hair)—asks for names and yells out to the audience, “Everyone say hello to ———!” to which the audience responds, in an eerie parody of an AA meeting or children’s TV show, “Hello ———!” There are exceptions, however. I interviewed one young woman who went fully through the virgin ritual. Amanda is a 19 year old college student, and, while not necessarily shy, has a quiet demeanor. She was dressed in a pair of knee-highs, heels, and black lingerie, with a button-up shirt cast open. She also happens to be naturally buxom, which, according to her account, elicited a rally cry of “Jump-ing Jacks! Jump-ing Jacks! Jump-ing Jacks!” from the crowd when she was introduced. Surprisingly, the women scream these calls as loudly as the men, sometimes louder. Despite the titillating shows, this is less about sexual arousal than breaking social boundaries.

After introductions are made, the contest begins. Either one or two virgins will be selected each night, so the other ten to twelve need to be eliminated by trial. The first trial being, as demonstrated in the “Time Warp,” the Pelvic Thrust Competition. The line of virgins is subjected to thirty seconds of constant pelvic thrusting to show their sense of rhythm, their lack of shame, and mostly their embarrassment at the entire situation. Many try to hide it, overcompensating by wildly flailing their bodies like a patient under a haywire defibrillator. Unless they’re exceptionally good-looking, these are usually ridiculed and eliminated. Others are meek, barely moving and exchanging nervous glances and angry accusations with their friends. These are often kept around for token entertainment. Then there are the fluid sex gods with hips of steel who get the crowd on their feet. These, obviously, stay.

Sometimes virgins are good thrusters and receive cheers
and propositions. Sometimes a group is so bad that the audience boos them down half-way through, and Frank sends almost all of them back into their seats. Frank exerts most of the control here, although if he weeds out an unusually cute or entertaining virgin the crowd will attempt to veto his decision by booing him. They have about 50% success.

Next comes the second trial, where the virgins must "Dance Nasty for the Wombat." The Wombat is never clearly defined, but many experienced Rocky kids will slowly chant "Wooommmmm-baaaaatttt, Wooooommomm-baaaattttt..." as Frank prepares the virgins for the trial. The lights fire up, and a random trance or house techno track will pour out over the speakers. Then, to strobes and flashing spotlights, the virgins bump and grind and, on occasion, even strip to please the audience. While I was dancing nasty for the Wombat, another man reached up around my waist and clung his body up against my back. To push the envelope of social acceptance, homoerotic dancing usually gets the best results. I played along for five seconds or so until one of the female virgins grabbed me by the leash and dragged me over to an activity that, while more personally fulfilling, didn't please the crowd as much as my momentary boyfriend had.

I took two good female friends, Caitlin and Tina, to their virgin Rocky experience, and they ended up dancing nasty together in order to avoid the random encounters I was subjected to. As a result they were loved by the audience, even if they weren't dressed up as extremely as I was.

After the nasty dancing is done, the final eliminations are made. Frank gives this a much more democratic air, petting each virgin lovingly and listening to the crowd reactions to decide their selection. The crowd seems to give approval based on four factors: Physical Attractiveness, Outfit, Shamelessness, and Dancing Skill. I was the male runner-up, and the last one eliminated. This was because I am in decent shape and was wearing tight, outlandish clothing, which gave me Attractiveness and Outfit points. I was also pretty Shameless, too. Dancing Skill was moderate, but my Shamelessness gave me an edge on that, too. I was beat out by a man wearing street clothes, however. This happened because, well, he began to take them off. And, as I remarked to a friend after the show, I couldn't compete with those abs. So although his Outfit rank was low and his Dancing Skill was nothing to shout about, his Attractiveness and Shamelessness were extremely high.

My busty friend Amanda, however, scored highly in all categories and was chosen as the female virgin of the night. This entitled her to the ritual deflowering, which, like the communion of Christ, is imparted symbolically to those who don't necessarily participate in it. Through Amanda, all the virgins in the room are deflowered. The process begins with the revelation of the Cherry--a large red balloon about the size of a beach ball. The clitoris jokes are obvious, usually two or three audience members are asked to "warm her up" by licking the balloon voraciously. Then, with sacramental reverence, Frank ushers the two virgins up on a box in the front of the theater. They cling to each other, barely able to balance on the box. To the delight of the crowd, Frank spreads apart their legs and shoves the balloons as close to their crotches as he can get. Alternately, he might bend both over and place it between the two of them. Then, the implement of popping can vary--teeth are usually the most popular, but once a zealous Frank assaulted the balloon with several pelvic thrusts until the pressure popped it.

Like a gun, the pop of the balloon starts a frantic cheering, and signifies the beginning of the race. The new are initiated, and the release of tension by that pop signifies the lessened inhibitions of the virgins and regulars alike. The stage is set, finally, for the show. The ex-virgins, either blushing or grinning profusely, are ushered back to their seats, and a victorious Frank addresses the crowd, "Ladies and gentlemen, are you ready for the Rocky Horror Picture Show?"

The lights dim and the movie projector clicks on. The audience cheers, and faux-Frank screams at the top of his
lungs, "What the fuck do you want?!" The crowd laughs and chants, "MUP-PETS! MUP-PETS! MUP-PETS!" Next thing you know, an old pre-movie short featuring Jim Henson's Muppets comes on. Elmo, Gonzo, Ms. Piggy, and their cohorts remind you not to smoke in the movie theater, how to exit, and to keep quiet in a kitschy song best relegated to kid's movies. Again, the use of childish innocence in such a perverse setting greatly delights the crowd. Some audience members sing along, some swear ("What happened to your fucking neck?") they yell at Cookie Monster) at the screen, and the new people look around, realizing what they're in for. And the calls begin.

"A long, long time ago!
In a galaxy far, far away!
God said, "Let there be lips!
And they were good lips!"

And, on cue, the red Rocky lips fade onto the screen. The crowd cheers, and the phenomenon of Audience Participation begins.

While the Audience Participation is impressive enough in itself, the history behind it is extensive and well-known by true Rocky aficionados. I did a little bit of digging at two of the online Rocky nexuses, rockyhorror.com and Cosmo's Factory, the largest unofficial fan-run Rocky Website. I've done my best to paraphrase it from these sources for you, though like any subculture's history the details tend to be contested and vaguely-defined.

The Rocky Horror Picture Show is a movie based on a very similar play written by Richard O'Brien, who plays the character of Riff Raff. The play was a moderate hit in London in 1973 and in 1975 the full feature film we adore was produced. The movie was tested in a few cities across the United States and bombed terribly. It was shelved and largely forgotten.

In the depths of Greenwich Village, at the Waverly Theater on April Fool's Day of 1976, a young advertising executive for Fox convinced the theater manager to use Rocky as the midnight picture show. Before each show, the movie soundtrack would be played (as the "Time Warp" still is) to warm up the crowd, and the relaxed, party atmosphere was established. A group of regulars began to establish themselves in the front row of the balcony seats, and on Labor Day weekend of 1976, the first "call back" was invented. A guy named Louis yelled "Buy an umbrella, you cheap bitch!" at Susan Sarandon as she walked through the rain, and Rocky was changed utterly.

As the weeks rolled by, people made more and more comebacks. By Halloween of 1977, dozens of people were dressing up as characters. Random audience members began to lip-sync to the soundtrack at the pre-movie warm-up, and this later developed into the skits we see in the pre-show.

Thirty years later, The Rocky Horror Picture Show has grown into a bestial organization and franchise, sporting hundreds of showings internationally and establishing itself as the quintessential midnight movie. Every five years, Las Vegas hosts a Rocky Horror Picture Show National Conference, where show managers and fanatics congregate with religious fervor. From Cosmo's Factory, one can download full scripts of call backs from over a dozen regions: New York, Balboa Island, Cleveland, Finland, Germany, Sacramento, and of course Cambridge are examples. And these are only cultures strong enough to have a canonical, 42 page, transcribed script of call-backs. Which, mind you, are organically always changing, so only expect about a 75% accuracy rate with the Cambridge script.

The tradition of screaming at the characters on screen has become a living, breathing oral tradition, with its sages and village elders to carry on the tradition to different cities, different shows, and different decades. In my six weeks at Rocky, several of the lines had changed considerably. At one point, Frank N' Furter is floating in a rectangular pool, the
floor of which is covered with a replica of Adam and God’s fingers touching, a la the Sistene Chapel. The first line I heard was a classic, “You’re telling me that all that stands between Man and God is a gay down?” But, over the weeks, another line took over that was more clever, “Michealangelo! Jesus Christ, I said the ceiling, not the pool! Ah well. I guess that’s what I get for having a Turtle paint my ceiling.” Speaking as a former devotee of the Teenage Mutant Ninja Turtles, I can attest that this line would resonate far more clearly to my generation than the connections of Eden and the Sistene Chapel ceiling which, sadly, is a reference many of the younger people missed or didn’t quite appreciate. As generations pass, the pop culture of the time overrides previous references, creating in itself a sort of pop-culture history: note that the Star Wars reference of “a long, long time ago” has stayed around since the late 1970’s, but although Fay Wray, the screaming vixen of King Kong, is specifically mentioned by Frank in one of the songs, the callback to the line “Whatever happened to Fay Wray / That delicate, satin-draped frame / as it clung to her thigh…” (Like a homesick abortion!) has nothing to do with her career, while the callback used two decades ago (She went apeshit!) did.

Current events also play heavily into the callbacks. At one point in the movie the camera scans over an empty theater. After the Red Sox won the ACLS against the Yankees, a few screamed out, “Hey, it’s Yankee Stadium during Game 6!” to the hollers of the audience. Local color is everywhere, too. As Rocky is playing with lighting switches during a part of the movie, the crowd calls out “One year at MIT! Two years at MIT! Three years at MIT!” Harvard, right next door, gets a decent amount of ribbing, too: the crowd here is rarely composed of the cosmopolitan students that attend the prestigious universities that Cambridge is laden with. Although many students attend Rocky at some point in their time here, the die-hards are comprised primarily of locals, if accents are a guide. Students don’t stick around long enough to keep it alive. Callbacks can be a dog-eat-dog, evolutionary world, too: someone from another town called out a line that was a New York line and was quickly and forcefully shot down by the locals, who repeated the local line even more loudly than usual. These competitions between audience members are far from rare: there are even front row/back row wars that go on, each throwing insults back and forth:

Front Row: Where’s the best place to fuck?!
Movie: “...in the back row...”
Front Row: Fuck the back row!
Back Row: Fuck the front row!
FR: We fucked you first!
BR: We fucking you better!
FR: We took pictures!!
BR: We took pictures and sent them to your mother!!
FR: We took pictures and sent them to your grandmother!!

There is something of an hierarchy that is created in this culture as well. The longer you’re there, the more you’re accepted and respected. I first called attention to myself by volunteering for the virgin ritual, although it was actually my third go. Considering I’d worn my costume the week before, though, one or two of the cast members had a look of slight recognition as I went up. Later in that show, the actor who played Frank N’ Furter eyed me as he strolled the aisle, then hopped into my lap and began ruthlessly molesting my hair, face, and shoulders, shouting to the crowd that I had an erection under my skirt (which I most certainly did not, for the record). The next week, the actor playing Rocky, in all his golden-briefed glory, jumped into my lap and pinned my shoulders with his knees, the look of recognition in his eyes. He’d passed up three rows of victims before he saw me, recognized me, and struck. I was new, but a potential regular. Hence, I had to be properly introduced--by having his crotch slammed into my forehead at high velocity.

I was talking to a friend of mine, an Anthropology major who did significant primate research in Africa. She once told me that you knew a group of chimps had accepted your
presence when they approached you and began looking for parasites in your hair. I think there's something similar going on here. While not formalized, there's something of an initiation into this group—the lifers are rarely molested by the actors, and usually only trade snappy one-liners with them. Some of the die-hards are even recognized by the cast so much that they have anniversary parties for them before the show: when a die-hard has an anniversary of their virgin show, they are often designated as the Wombat, and the virgins are required to give them lap dances.

And about the actors. All the while, the entire movie is being acted out underneath the screen by amateur actors. They lip-sync, run around, and have even constructed temporary sets that they put up and break down from scene to scene. Both shows going on at the same time can be a bit disorienting, and so the actors will often modify the actions of the characters (like molesting me, for instance) to spice up the floor show. They might, for instance, spray water into the crowd during rain sequences, or do full sexual pantomimes to keep the audience attention.

The actors follow the same demographics as the audience. Some are high-school age, but the majority are college-age up to their late twenties, with the grizzled vets reaching into their early thirties. Women will often play men's roles (the Narrator and Eddie especially), whereas most of the men are already dressed as women anyway. The entire acting troupe has a very old-theater feeling to it. With the crowd participation, the rollicking good humor, and the constant cross-dressing, Rocky has much more in common with Shakespearean comedy than most literati would have you believe. While the clean aesthetic of Shakespeare in history may be academically pleasing, the reality of the grimy peanut gallery in the Globe Theater turned out very much like these Rocky kids, with cheering and booing and loud behavior. The resemblance becomes more interesting if you consider that the iconic Tim Curry, the original Frank N Furter in both the movie and the play, made his name in Shakespearean acting.

Why would a classical actor sign up for such a crazy thrill-ride? In an interview I found on a Rocky fansite (considering the obscurity of the subject matter, more "academic" web sources are hard to find) Curry says, "It was a joke on horror movies and on the glitter rock movement that was so big back then—the androgynous sex, the Bowie/Jagger thing. But I didn't camp it up—we decided from the beginning to play it seriously" (crunk4curry.tripod.com).

And, while not every seventeen year-old fan will appreciate the parody of mid-1970s glam culture, the tradition of joking with a straight face has certainly lived on. A good amount of the call-backs have a dry humor to them, and are often fairly sophisticated alongside the juvenile lines. For instance, during a dinner scene where Frank is serving up the corpse of the recently-murdered Eddie, Frank says of Eddie's murder, "That's a rather tender subject." The audience responds, quite straight, "That's a rather tasteless joke." People don't really laugh as much as grin wickedly. But just ten seconds later, as Magenta runs from the room screaming at the discovery of her cannibalized boyfriend, the crowd yells, at her screaming, "That's what you get for masturbating with a razor blade!"

You don't have to tell this audience they're juvenile—they seem to know it, and don't feel they have anything to prove. And, considering the dry wit they show in the middle of the immaturity, they really don't. That's why the show remains funny, and why grown adults can return again and again. This isn't just regression to adolescence: it's a theater full of legitimately funny people trying to one-up each other.

There are plenty of reasons that people frequent Rocky. Other than the outrageous behavior and the movie, the Rocky experience is a release of the cultural id—a place where you can yell "Fuck your mother!" at a random stranger and nobody gets offended. And anyone who drives regularly in coastal Massachusetts can attest to how often that impulse flares up in the space of a day. You're not supposed to throw rice inside—here you can. As a woman, you're supposed to
refrain from too many dirty jokes in public; here you can relish in them like a construction worker. As a man, you're expected to wear rougher blends of clothing and act with a certain low-key gruffness. Here you can cover yourself in silks and satins and walk daintily without fear of ridicule. In fact, you'll probably be encouraged.

I think of the number of times in conversations about relationships someone has said to me, "I just wish I could be a guy/girl for a day, just to know what's going through their minds." While there's no complete transformation here, Rocky allows its patrons to muddle in the great cultural divide between man and woman as much as they like. Women regulars show the same sexual zeal and aggression as the men, and the male virgins will often blush or balk as much as the females. There a sort of crazy equality in this theater, where the lines of propriety are thrown completely out the window, and everyone can mix and mingle and grope to their heart's desire.

It takes a while to get people in this mood, though. And that's why there are the elaborate, sexually-themed pre-shows. That's why the focus is a movie--it's easier to scream this stuff at a movie screen than a human being. That's why you throw rice and toilet paper--general zaniness needs to be established to bring people out of their shells. It doesn't work on everyone. Many people will enjoy themselves but remain observers who half-smile, half-dash out the door at the end of the night into the comfortable arms of society. Those who linger and return, however, are the ones the regulars are really concerned with: tourists pay the bills but aren't that important.

If you consider the focus on the virgins, you notice something else--as much as they are ridiculed and toyed with, the show is more for them than anyone else. The elders pass on their oral tradition for the entertainment and shock of the newcomers because A) it reaffirms the weirdness of the elders, which they love, and B) everyone remembers the confusion and amazement that hit them in their first Rocky experience, and they want to create it for others.

I took a group of newcomers to the show once, and we got there a bit late, so we had to settle for the back row instead of the generally more animated front row. At this point I'd gone several times, and knew about 20% of the call-backs. Which I hollered at the top of my lungs, so the newcomers wouldn't miss out. I hadn't even dressed up that week, but I acted more extremely because I had a corral of virgins to take care of. The same was done to me when I was a virgin--we had to sit off to the side, and my usually quiet guide started screaming much more than she admits she usually would. You'll notice it, too, the lone voice barking out from a mass of bodies, who often look at their friend with a sort of shocked amusement.

By getting an infusion of fresh blood each week, the Rocky experience keeps itself new and relevant--the call-backs change with the audience, and the veterans get a continual kick at the constant, weekly contrast between themselves then and themselves now, because they too were once clueless virgins. So, while there is a sort of elitism and exclusion in this culture, it is a gentle one that admits its need--due to its focus--on the new people. And, if one is outgoing and persistent enough, one will be molested and harassed until you've earned your entry into the culture. And, as you become louder and more confident in your mastery of callbacks you'll be noticed and accepted more and more. For kids who ride the breach of the gender boundary--as one may assume if they're even willing to dress up for this--this sort of inclusion is hard to find. Fetish clubs, drag clubs, and the like are catering to a different market entirely--Rocky kids are mostly weekend warriors, not careerists. In the madcap joke that is The Rocky Horror Picture Show, these people find their weekly release from the roles they have been programmed to play, and get a good laugh from the contrast they see from their own 9-5 lives.

Also, in the middle of the craziness, there is a real bond expressed here. My last Rocky experience was also the last
show for a beloved fan and cast member, a woman in her late twenties. She was just recently married, moving on with life, and had to travel to start her career after seven long years with the theater. The audience mourned as Frank announced the sad news, and some of the die-hards were on the brink of tears. She was a sort of Peter Pan, finally with growing up and leaving this fairy-tale world behind her. But they spent almost fifteen minutes properly sending her off, forcing the virgins to honor her with free lap dances and auctioned off a cast lap-dance to a member of the crowd for $45, the proceeds of which went towards her sending-off gift. It was, in a bizarre way, a very touching moment. At the end of the show, Frank walked her in front of the theater and she was given a standing ovation by new and old alike for her final walk up the aisle.

The movie lets out around 2:30 A.M. and the bizarre parade spills out into the sleeping Square. The bars are closed. The bus and subway have stopped. Nobody is left on the streets except for a few vagrants and random night wanderers. The kids don’t get too out of hand, but the culture really starts to merge and mingle outside the theater, their sexual awareness heightened by two hours of debauchery while the influences of proper society are tucked away in bed. Flirting abounds, groping abounds, and even the occasional couple-for-a-night escaping into the dark is not an uncommon sight. There isn’t too much of a hook-up scene, however: the rollicking, bizarre good humor that fills the streets is the main attraction. I saw more of this in early October during my first trip, whereas December was a bit too cold for all but the most die-hard. I would love to return for a few weeks in the summer, when the weather is kinder to the minglers. Nonetheless, cliques merge, break apart, and the people in street clothes will sometimes engage in the most bizarre behavior of the night. Eventually people shuffle home or bring their party elsewhere, but the weekly bond of lifers, actors, and virgins constructs and deconstructs with a renewed burst of energy, creating a flashy, trashy spot of agitation in the slumbering shadow of Harvard—a technicolor glitz of gender, sexual, and social transgression that gives the finger to the status quo, but welcomes its newcomers with a loving pelvic thrust.

Works Cited


Unraveling the Geologic History of the Avalon Terrane in MA

BY ERIN NEVENS

Abstract

Field and petrographic analysis of rocks at Black Rock Beach in Cohasset, MA record at least two phases of metamorphism and magmatic activity and three episodes of deformation. The earliest phase of metamorphism and deformation are recorded by mafic gneiss xenoliths. These xenoliths preserve a mylonitic texture, which represents development in a ductile deformation environment. The xenoliths occur as large blocks that were later incorporated into the intruding magma of the Dedham granodiorite. Following crystallization, the Dedham granodiorite experienced an episode of plastic deformation. This event resulted in the development of a weak foliation defined by aligned feldspar porphyroclasts. Quartz and feldspar microstructures indicate deformation occurred between 350-450°C. A second phase of magmatic activity was associated with the intrusion of several 1-2 meter wide porphyritic basalt dikes that cross-cut both the xenoliths and granodiorite, and resulted in the brittle cataclasis of the Dedham granodiorite. The basalt dikes were emplaced during a time of crustal extension and subsequently experienced a late-stage hydrothermal alteration.

The absolute timing of these tectonic events is difficult to determine unequivocally due to the lack of precise geochronologic data available. The crystallization age of the Dedham granodiorite has previously been reported as 622 Ma. Thus, the earliest phase of metamorphism recorded by the xenoliths must pre-date 622 Ma, whereas the youngest deformation and emplacement of the basaltic dikes must post-date this age.

Introduction

The geology of Massachusetts is the result of a complex and prolong history involving several major mountain building events separated through time and
space. The bedrock geology can be described in terms of an amalgamation of different geologic terranes. The most prominent terrane in eastern Massachusetts is the Avalon terrane. In an effort to decipher the geologic history of a portion of the Avalon terrane we applied basic field observations along with detailed petrographic analysis.

Rocks located at Black Rock Beach, Cohasset, MA, record multiple deformation and metamorphic events that reflect the complex nature and geologic history of the Avalon terrane prior to its accretion to the North American continent during the Acadian Orogeny (380-360 Ma). We attempt to unravel this history by combining mesoscopic observations and microscopic analysis in order to determine the relative age of geologic events and the conditions of metamorphism and deformation. Identification of microtextures in certain minerals can be used to provide information on the temperature conditions and style of deformation (i.e. plastic vs. brittle). Previously published U-Pb geochronology is used in conjunction with field relationships to place some constraints on the timing of these tectonic events and to decipher a clearer picture of the geologic history. Our results will add to the recent recognition of a more complex history involving several overprinting orogenic events that affected the Avalonian terrane throughout Proterozoic-Paleozoic time.

Geologic setting

Massachusetts can be subdivided into a series of geologic terranes, each of which consists of distinctive rock types that have different affinities and geologic histories. These terranes include from west to east: Laurentia (North America), Merrimack, Nashoba, Avalon, and Meguma (Figure 1). The latter four terranes have origins with Gondwana (African) affinities. Through a series of tectonic events, these terranes were successfully accreted to the eastern margin of Laurentia over a span of several hundred million years (Skehan, 2001). This study concentrated on crystalline rocks that occur within the eastern portion of the Avalon Terrane (Figure 1). Avalon formed as a volcanic arc along the western margin of Gondwana in Late Proterozoic time. During the Late Proterozoic, the margin of Gondwana underwent a phase of sinistral shear producing what is now known as the Burlington Mylonite Zone (BMZ). The BMZ has had a history of multiple phases of movement and shearing. Presently, it forms the western boundary of the Avalon terrane with the Nashoba terrane. Avalon rifted away from Gondwana ~465 Ma (Veevers, 2003) and began a slow trek across a proto-Atlantic ocean where it experienced several major orogenic events and its final collision with Laurentia. The Acadian Orogeny (~425-370 Ma) was a time in which the Avalon volcanic arc collided with the eastern margin of Laurentia (North America) resulting in widespread high-grade metamorphism and plutonism. Later, during the Carboniferous Alleghanian Orogeny (354-250 Ma), Avalon was involved in the final collision between North America and Africa forming the supercontinent Pangea. This event resulted in another phase of high-grade metamorphism and minor plutonism. The youngest orogenic event to affect Avalonian rocks was the subsequent break up of Pangea during Triassic-Jurassic time (Skehan, 2001). Breakup was associated with tensile stresses and brittle deformation that allowed basaltic magma to intrude along a series of predominantly E-W and NE-SW fracture sets.

Results

Field Relationships

The outcrop of interest at Black Rock Beach contains three distinct rock types: Dedham granodiorite, mafic gneiss, and porphyritic basalt. Each rock records a small portion of geologic time, but together they allow us to decipher the events that affected this part of the Avalon terrane and reconstruct the geologic history.

Beginning in the southeast portion of the beach and traversing to the northwest corner of the beach, the rocks con-
sist mainly of mafic gneiss. The gneiss occurs as xenoliths within the younger Dedham granodiorite. The xenoliths display a strong gneissic foliation defined by altering layers of felsic and mafic minerals, and is intensely folded and distorted (Figure 2A). Xenolith abundance decreases towards the middle of the outcrop where it is equally mixed with granodiorite, but the mafic gneiss still dominates the eastern portion of the outcrop.

Another lithology present in the outcrop is mildly deformed to undeformed Dedham granodiorite. These rocks display a phaneritic to porphyritic texture with large megacrysts of orthoclase feldspar (Figure 2B). Traversing to the southeast the granodiorite develops a weak deformatonal fabric defined by the alignment of feldspar megacrysts (Figure 2C).

There are also at least four large mafic dikes that occur within the outcrop (Figure 2D). They are dominantly porphyritic basalt dikes that have a greenish tint due to the presence of chlorite and/or epidote. Phenocrysts consist of plagioclase feldspar ranging from 0.01 to 2.0 cm in size that are aligned in places perhaps in response to flowage. Two of the basaltic dikes have a northeast-southwest trend, whereas the third and fourth dikes have an east-west trend. On the basis of cross-cutting relationships we can determine that the east-west trending dikes cut across the NE-SW dikes and are thus the youngest igneous feature. Also present throughout the outcrop are numerous small quartz veins.

**Petrographic Analysis**

Initially, the majority of the samples analyzed were obtained from the mafic gneiss xenoliths in an effort to document the metamorphic mineral assemblages and constrain the conditions of metamorphism (temperature & pressure). In addition, samples of the Dedham granodiorite were also collected to investigate evidence of post-intrusion deformation that affected this felsic pluton following crystallization. Finally, several samples from the porphyritic basalt dikes were studied to determine the mineralogy and to see if these dikes were deformed and the extent of hydrothermal alteration following emplacement.

### Mafic Gneiss Xenolith

Sample 1: This sample contains medium to small subhedral crystals of plagioclase and orthoclase, which are slightly altered to clay sericite and display undulose extinction. Other minerals include small to medium sized anhedral quartz crystals, epidote and clinozoisite veins with small subhedral crystals, and medium sized subhedral chlorite altering after biotite. Quartz crystals display undulose extinction, deformation lamellae, and grain boundary migration recrystallization (GBM). An epidote vein is also cross-cut by a secondary quartz vein. The bulk composition is 40% feldspars, 25% quartz, 5% chlorite, 1% epidote, 1% clinozoisite, 3% sericite, 10% undetermined matrix, and 6% opaque minerals. The overall rock texture of this sample is slightly mylonitic (Figure 3A).

Sample 2: This sample has medium grained, subhedral plagioclase and orthoclase crystals. These feldspars are altered to fine-grained sericite. Some of the orthoclase feldspar crystals have a perthitic exsolution texture. There is abundant chlorite in stringy subhedral crystals altering from biotite in the sample, as well as a few epidote veins and individual crystals. Anhedral crystals of quartz occur in varying sizes. The boundaries between the quartz crystals are highly irregular and sutured. Quartz and feldspar both display undulose extinction. The quartz crystals also show signs of GBM and deformation lamellae. It is apparent the epidote veins formed last, because they transect other crystals. Petrographically, this sample appears multi-textured with the middle displaying a more mylonitic texture, whereas feldspars near the edge are larger and relatively undeformed. The matrix is intertwined with the chlorite and in between are quartz and feldspar crystals. The bulk composition of sample is 33% feldspars, 23% quartz, 8% epidote, 9% chlorite,
Sample 4: This thin section contains orthoclase (microcline variety) (Figure 3B) and plagioclase feldspar porphyroclasts that are generally medium grained and subhedral. Some crystals display minor sericite alteration. Other feldspar crystals possess perthitic textures and some exhibit undulose extinction. Also present in the sample is chlorite that is generally clustered around feldspars, altering from biotite and very stringy in appearance. Epidote veins occur throughout this sample. Also, small to medium grained anhedral quartz crystals are found in clusters. The quartz crystals display GBM, undulose extinction, and deformation lamellae. Sericite can be found as both large individual grains as well as fine-grained matrix within veins. The overall sample has a slight mylonitic texture to it with a mostly fine-grained matrix with visible chlorite and sericite. The bulk composition of the sample is 37% feldspars, 23% quartz, 8% chlorite, 3% biotite, 9% epidote, 16% sericite, and 4% of a matrix of unknown composition.

Sample 6: This thin section contains significant clay alteration of feldspars and clusters of small anhedral quartz crystals and chlorite, biotite and epidote subhedral crystals. Undulose extinction occurs in both the quartz and feldspar grains. The quartz crystals also exhibit deformation lamellae and GBM. The sample has a mylonitic texture characterized by augen shaped quartz. The matrix consists of sericite, chlorite and abundant fine-grained unidentifiable minerals. The bulk composition of this sample is 15% feldspars, 25% quartz, 10% chlorite, 3% biotite, 10% epidote, 2% clinzoisite, 17% sericite, and 18% of a matrix of unknown composition.

Sample 7: This sample contains two very distinct mineralogic domains. One is an altered clay rich zone, whereas the other is clay-poor. In the least altered portion feldspars are generally not altered to clay and are medium grained and subhedral. Also present, in a range of grain sizes, are anhedral quartz and traces of chlorite and epidote. The more altered, clay-rich domain contains small subhedral crystals of quartz and feldspars within an unidentified matrix. Some of the feldspars that are not completely altered preserve a perthitic texture. There is undulose extinction in quartz and feldspar. The quartz crystals also display GBM. This thin section contains abundant epidote veins. The overall composition of this sample is 18% feldspars, 22% quartz, 9% chlorite, 3% biotite, 10% epidote, 2% clinzoisite, 18% sericite, and 18% of a fine grained matrix.

Sample 8: Variable sized subhedral feldspar crystals appear in the sample, many of which are highly altered to clay. Some of the feldspars display a perthitic texture, bent twin striations, and strong undulose extinction. Medium grained, subhedral chlorite, small anhedral quartz, and small subhedral epidote veins and crystals are also present within this sample. The quartz crystals exhibit GBM and undulose extinction. The texture of the thin section is generally mylonitic. The matrix making up the mylonitic texture is chlorite, sericite, and other fine-grained minerals and augens, which are quartz. The bulk composition of this sample is 16% feldspar crystals, 22% quartz, 8% epidote, 10% chlorite, 3% biotite, 3% opaque minerals, 20% sericite, 2% clinzoisite, and 16% matrix of unknown composition.

Sample 9: This thin section has variable sized feldspar crystals that experienced clay alteration and display minor relict undulose extinction. Some feldspar crystals have a perthitic texture. The other minerals present are small anhedral quartz crystals, subhedral opaque minerals, subhedral epidote and clinzoisite crystals, and small to medium sized sub-anhedral chlorite crystals. Some of the quartz crystals have deformation lamellae and most display GBM and undulose extinction. This thin section has a mylonitic texture throughout with a matrix of mostly fine grained minerals, but also some sericite and chlorite. The augens consist of quartz. The bulk composition of the sample is 29% feldspars, 20% quartz, 17% sericite, 3% clinzoisite, 8% epidote, 8% chlorite, 5% biotite, 3% opaque minerals, and 7% opaque minerals.
Sample 10: This sample contains subhedral feldspar crystals, some of which are altering to clay, and display either undulose extinction and/or a perthitic texture. This sample also contains anhedral quartz of varying sizes, medium subhedral chlorite crystals altering from biotite, and small subhedral epidote crystals. The quartz crystals preserve GBM and undulose extinction. When seen as a whole, the thin section has a matrix of sericite, chlorite, and fine-grained minerals that are wrapped around augens of quartz forming the mylonitic texture. The overall composition of the sample is 29% feldspars, 20% quartz, 9% chlorite, 4% biotite, 10% epidote, 2% clinozoisite, 16% sericite, 3% opaque minerals, and 7% of a matrix of unknown composition.

Dedham Granodiorite

Sample 3: In sample 3 the quartz crystals display GBM, deformation lamellae, and undulose extinction (Figure 4A). It also contains large subhedral orthoclase (microcline variety) and plagioclase feldspar crystals that have several microfractures (Figure 4B), bent striations, and undulose extinction. Some feldspar grains are altering to clay, while others display a perthitic texture. The most distinguishing feature of this sample is the extremely fractured and cataclastic nature of the feldspars. Feldspars contain numerous microfractures and have been brittlely deformed resulting in a significant reduction of grain size. Other minerals present include epidote, which occur as veins with small subhedral crystals; euhedral medium chlorite crystals; and medium anhedral quartz crystals. It also contains an epidote vein that cuts across other minerals, but then has small anhedral quartz crystals within it. The bulk composition of the thin section is 43% feldspar, 17% sericite, 17% quartz, 11% chlorite, and 12% epidote.

Sample 5: Sample 5 has medium-coarse grained subhedral orthoclase and perthitic plagioclase many of which are altering to clay and typically show undulose extinction. Other minerals present include elongated subhedral chlorite, anhedral quartz, and epidote veins. Quartz show signs of GBM, undulose extinction, and deformation lamellae. The bulk composition of the thin section is 42% feldspars, 26% quartz, 10% chlorite, 15% epidote, and 7% sericite.

Sample 14: This sample contains abundant coarse-grained subhedral crystals of feldspar, several of which are altering to sericite. The feldspars commonly exhibit undulose extinction. The polycrystalline twin planes in plagioclase are extremely deformed. Orthoclase commonly displays Carlsbad twinning although it is obscured as a result of clay alteration. Many of the feldspar grains contain microfractures that are filled or sealed by small epidote crystals. A large epidote vein cuts this sample and consists primarily of small subhedral crystals. Also, present in the sample are medium-grained subhedral chlorite crystals and small anhedral quartz crystals. The bulk composition of the thin section is 43% feldspar, 17% sericite, 17% quartz, 11% chlorite, and 12% epidote.

Sample 15: This sample contains predominately large subhedral feldspar crystals many of which experienced alteration to clay. Plagioclase crystals display bent twin planes and undulose extinction. K-feldspar displays a perthitic texture and most of the crystals are cut by brittle microfractures. Small subhedral epidote crystals occur within the microfractures and veins. The thin section also contains medium-grained subhedral chlorite grains and small anhedral quartz crystals. Quartz exhibits signs of plastic deformation in the form of deformation lamellae, GBM, and undulose extinction. The overall composition is approximately 50% feldspar, 20% quartz, 10% sericite, 15% epidote, and 5% chlorite.

Sample 16: This sample possesses large subhedral feldspar crystals that contain abundant microfractures. Some of the microfractures contain epidote crystals. The feldspar crystals display undulose extinction. The plagioclase crystals contain bent striations and the orthoclase crystals have
weakly developed Carlsbad twinning. Also present are small subhedral epidote and chlorite, as well as, small anhedral quartz crystals. Quartz commonly displays undulose extinction, GBM, and deformation lamellae. The modal composition for this sample is 44% feldspar, 17% quartz, 12% sericite, 11% chlorite, 11% epidote, and 5% opaque minerals.

Sample 19 a & b: These thin sections contain many large feldspar crystals some of which have altered to sericite and some contain small inclusions of quartz or plagioclase. The plagioclase crystals have bent striations and Carlsbad twinning can be seen in some of the orthoclase crystals. Most of the feldspar crystals have microfractures, some of which are filled by small epidote crystals. The remainder of the sample consists of subhedral chlorite crystals altering from biotite, small subhedral epidote crystals, and small anhedral quartz crystals. The quartz crystals display undulose extinction, GBM, and deformation lamellae. The modal composition of this sample is 45% feldspar, 18% quartz, 12% sericite, 10% chlorite, 10% epidote, and 5% opaque minerals.

**Porphyritic Basalt Dikes**

Sample D1 b: This sample was obtained from an E-W trending dike. It is aphanitic with a rather even distribution of subhedral plagioclase and epidote crystals. It also contains subhedral chlorite crystals and anhedral opaque crystals. The overall composition of the rock is 35% plagioclase, 35% epidote, 20% chlorite, and 10% opaque minerals.

Sample D2: This sample is from an NE-SW trending dikes. It contains both small subhedral plagioclase crystals and larger phenocrysts of plagioclase that are altering to sericite (Figure 5). It also has small anhedral epidote and chlorite crystals. Veins of epidote are also present within this sample. The modal composition is 50% plagioclase, 35% epidote, and 15% chlorite.

Sample D3: This sample is another of the NE-SW trending dike. It is fine-grained, but the grain size is a few millimeters larger than that observed in sample D1 b. The sample contains small subhedral plagioclase grains and larger plagioclase phenocrysts that are altering to sericite. There are also subhedral epidote and chlorite crystals in the sample. Throughout the sample there are a few opaque minerals. The overall composition is 43% plagioclase, 30% epidote, 15% chlorite, and 10% opaque minerals.

**Discussion**

The geologic history of this portion of the Avalon terrane can be deciphered by studying the field relations, mineral assemblages, and microtextures in the lithologies present at Black Rock Beach. The first geologic event that we document is the formation of the protolith, or parent material, for the mafic gneiss. However, the actual lithology cannot be readily identified because it is extremely difficult to determine the original rock since it has been subjected to a phase of intense ductile deformation and metamorphism. Some time prior to 622 Ma (the crystallization age of the Dedham granodiorite), metamorphism and deformation transformed the protolith into gneiss that locally preserves a mylonitic texture. The mafic gneiss most likely developed during a phase of ductile shearing possibly related to the Burlington mylonite zone. The absolute time of the first episode of metamorphism is not precisely known since no radiometric dates exist for these rocks. However, these rocks must be the oldest since they are intensely metamorphosed and deformed and occur as xenoliths within the 622 Ma Dedham granodiorite and both are cross-cut by the basaltic dikes.

**Conditions of Metamorphism in Xenoliths**

As part of reconstructing the geologic history of the area we attempted to determine the conditions of metamorphism in the mafic gneiss xenoliths. However, the mineral assemblages preserved within the mafic xenoliths do not reflect the prograde or peak metamorphic mineral assemblage. The assemblages reflect the retrograde alteration that followed peak metamorphism. Thus, only a minimum estimate can
be provided on the metamorphic conditions prior to their incorporation as xenoliths within the Dedham granodiorite. On the basis of the mineral assemblage preserved (epidote, plagioclase, chlorite), we interpret these rocks as experiencing at least greenschist to epidote-amphibolite facies metamorphic conditions (~300-500°C & ~5 kilobars). However, the intensely foliated and folded nature of the gneissic layering suggests even higher metamorphic conditions. The folds present in the xenoliths formed in a compressive tectonic environment suggesting the first episode of metamorphism and deformation was associated with a large-scale plate collisions.

Several of the mafic xenoliths preserve a microtexture that resembles a mylonitic shear fabric (Figure 3A). Mylonites are formed in ductile shear zones and represent crustal discontinuities that accommodate movement within or between lithospheric plates. The only major mylonite forming around the probable time that the mafic gneiss was being deformed was the Burlington mylonite. The Burlington mylonite developed in the Precambrian when the western margin of the Gondwana continent experienced a period of ductile shearing (Skehan, 2001). Reactivation of the Burlington mylonite occurred during the Silurian as the Avalon terrane subducted beneath the Nashoba terrane (Skehan, 2001). If a Silurian collision was responsible for the mylonitic texture in the gneiss than the Dedham granodiorite should also display a pervasive mylonitic texture, however, it does not. A more reasonable interpretation for the mylonitic fabric observed in the mafic xenoliths is that they represent blocks of Burlington mylonite that formed during the Precambrian and were subsequently broken off and later incorporated into the intruding Dedham granodiorite magma prior to 622 Ma.

**Conditions of Deformation in Dedham Granodiorite**

Even though the Dedham granodiorite does not display a pervasive mylonitic fabric, it has experienced post-crystallization plastic and brittle deformation. Crystal-plastic deformation in quartz and feldspar occurs at temperatures above 300 ± 50°C and 450 ± 50°C, respectively (Tullis, 1983; Tullis and Yund, 1977; Voll, 1967). By using microtextures preserved in quartz and feldspar we were able to identify an episode of deformation that occurred predominantly between 350° to 450°C. Quartz commonly displays sutured grain boundaries which is indicative of grain boundary migration recrystallization, undulose extinction, deformation lamellae, and subgrain formation (Figure 4A). These textures are developed during intracrystalline plastic deformation, which for quartz begins around 350°C (Tullis, 1983; Tullis and Yund, 1977; Voll, 1967). The onset of intracrystalline deformation in feldspar occurs when temperatures exceed 450°C. Feldspars from the Dedham granodiorite display only minor effects of intracrystalline deformation and include undulose extinction and bent twin striations (Figure 4A). Following this episode of plastic deformation, the Dedham granodiorite also experienced a phase of intense cataclasis and brittle deformation resulting in the fracturing and cataclasis of quartz and feldspar (Figure 4B) indicating temperatures of these rocks were well below 300°C.

**Sequence of Events**

The Dedham granodiorite represents a period of felsic magmatism during subduction beneath the Avalon terrane. In an effort to determine the timing of crystallization of the Dedham pluton, Zartman & Naylor (1984) performed U-Pb dating of zircon. Results yielded a discordant array of data in which a chord can be drawn through the data points. This chord resulted in a lower intercept of 4 Ma and an upper intercept of ~622 Ma (Figure 6). The upper intercept is interpreted as the time of crystallization and thus provides a minimum age for the first episode of deformation and metamorphism recorded by the mafic xenoliths. The lower intercept age is geologically meaningless and may reflect a later hydrothermal/chemical alteration event. Following emplacement of the Dedham granodiorite at 622 Ma, a portion of
this pluton experienced a phase of plastic deformation along with the mafic gneiss. This deformation may have been in response to a collision between Avalon and some exotic lithosphere plate. The final episode of deformation that affected the Dedham granodiorite was low temperature brittle deformation and cataclasis. The formation of the Ponkapoag fault, which extends through this area may be responsible for this phase of brittle deformation although its absolute age is uncertain. Although it does not display any obvious surficial expression, the presence of the fault is inferred because just north of the study area an outcrop of Cambrian-age Roxbury Conglomerate has sedimentary bedding that tilts southward 15° and would project beneath the crystalline rocks of the Dedham granodiorite.

The final igneous event to affect rocks at the Avalon terrane, and associated with the brittle deformation, was the intrusion of two pulses of basaltic magma along NE-SW trending and E-W trending fractures. The first pulse was associated with, and emplaced along, NE-SW trending fractures. The second pulse of basaltic magma was emplaced along E-W trending fractures and cross-cut the older NE-SW dikes. The basaltic dikes have also been affected by a post-emplacement, low temperature hydrothermal event. The age of emplacement for these basalt dikes is uncertain due to the lack of radiometric age control. All we can say for certain is they are younger than 622 Ma and that the E-W trending dikes are younger than the NE-SW trending dikes. The dikes themselves were emplaced during a time of crustal extension and rifting. One possibility is they are Jurassic in age and represent the break-up of the supercontinent Pangea that formed at the close of the Paleozoic. Break-up began in the Triassic approximately 240 Ma with the entire eastern margin of North America intruded by basaltic dikes at 200 Ma. Alternatively, these dikes could represent an earlier rifting event in the Late Proterozoic or Early Paleozoic possibly when Avalon was separating from Gondwana. Without precise isotopic dates we cannot distinguish between these two models.

References Cited


Figure 1. Generalized terrane map of Massachusetts. Modified from Skehan (2001).

Figure 2. Field photographs of rock units exposed at Black Rock Beach. A) folded and intensely foliated mafic xenolith incorporated in weakly deformed Dedham granodiorite (quarter for scale); B) Undeformed Dedham granodiorite; C) Deformed and weakly foliated Dedham granodiorite (arrow shows alignment of feldspar clasts); D) undeformed, E-W trending, porphyritic basalt dike (view towards the east).
Figure 3. Photomicrographs of mineral assemblages in rocks at Cohasset. A) Mafic gneiss, plagioclase is highly altered clay (PL) and chlorite is abundant (CHL); B) Dedham granodiorite with microcline (M); C) porphyritic basalt dike. Phenocrysts of plagioclase (PL) set in a fine grain matrix of plagioclase laths. Abundant epidote (E) suggests post-emplacement hydrothermal alteration. All photographs are in cross-polarized light (XPL) except A, which is in plane polarized light (PPL).
Figure 4. A) Photomicrographs of sample 3 showing quartz and feldspar microstructures in the Dedham Granodiorite. Quartz (Q) exhibits sutured grain boundaries, undulose extinction, and subgrain formation, all indicative of plastic deformation at temperatures above 300°C. Feldspar (PL) exhibits only minor plastic deformation in the form of undulose extinction and bent twin lamellae suggesting temperatures exceeded 450°C, locally (XPL). B) Cataclastic microfracturing in feldspar from the Dedham granodiorite (XPL).

Figure 6. Ti-Y-Zr tectonic discrimination diagram shows results from two basalt dikes at Black Rock Beach (after Pearce and Cann, 1973). Both samples fall in the within plate field and represent continental rifting.
Field, Petrographic, and Geochemical Characteristics of Price Creek

by Russ McCormack

Abstract

Geologic mapping in the southeastern portion of the Blacktail Mountains has revealed a more diversified stratigraphic sequence than previously documented. Prior mapping of this area has shown it as a single volcanic unit composed of a maroon rhyolite tuff, possibly erupted from the Eocene Dillon volcanic center located ~50 km to the northwest. Our mapping allowed us to further subdivide this unit, which we term the Price Creek unit (PCu), into two distinct lithologies based on mesoscopic characteristics: 1) a basal volcanic breccia and 2) a rhyolitic tuff.

This study focuses on petrographic and geochemical analyses of the PCu in an effort to better define and elucidate its petrogenesis. The lowermost unit of the PCu is a maroon, coarse-grained, matrix-supported volcanic breccia that unconformably overlies Archean gneiss. It contains subangular clasts (1-10 cm) of predominately granitic gneiss with crystal fragments of quartz and feldspar. The contact between the basal breccia and the gneiss is sharp and highly irregular. Locally, maroon, aphanitic veinlets cross-cut and intrude parallel to the gneissic foliation in basement outcrops. The breccia is overlain by an aphanitic, maroon rhyolitic tuff. Petrographic analysis reveals it contains angular to subrounded lithic and dominantly quartz crystal fragments with rare euhedral quartz phenocrysts set in a microcrystalline groundmass.

Preliminary XRF analysis of PCu rhyolite tuff reveals a very high SiO₂ content (85%) and a severe depletion of all other major element oxides with the exception of aluminum and iron (<1 wt% K₂O, Na₂O, CaO, MgO). The extreme enrichment of silica, depletion in other elements, and hematitic staining strongly suggests major geochemical alteration and modification following the formation of the rhyolite. The precise timing and nature of this alteration event is poorly
constrained but may be related to the development and hydrothermal activity associated with the post-Laramide normal movement on the Jake Canyon fault. The Jake Canyon fault, which marks the range front at Price Creek, is highly silicified with large masses of vein quartz (locally 10s of meters in thickness) found along its trace. Hydrothermal fluids permeated footwall and hanging wall rocks causing hydrothermal alteration 100s of meters from the fault.

Introduction

Southwestern Montana is characterized by a number of ancient magmatic centers that erupted throughout the Eocene (40-50 Ma). Rocks that occur at the southeastern end of the Blacktail Mountains in the Price Creek and Teddy Creek stream drainages have previously been mapped as a single stratigraphic unit composed of volcanic rhyolite tuff and lava flows resting unconformably on top of 2.7 Ga Archean gneiss (Lonn et al., 2000). These workers correlated these rhyolite tuff/lava units with volcanic rocks just west of the town of Dillon, MT and speculated they are related to activity associated with an Eocene-age (~41 Ma) magmatic center that is located approximately 50 km away. In an effort to elucidate the origins and geologic history of volcanic rocks in the Price Creek drainage we conducted detailed geologic mapping and performed a petrographic and geochemical comparison between the Dillon and Price Creek volcanics.

Our mapping in the southern end of the Blacktail range has revealed a more complex and distinctive stratigraphic sequence than previously recognized. On the basis of field relationships we have subdivided this unit, which we term the Price Creek unit (PCu) into: 1) a basal volcanic breccia; and 2) an overlying interlayered sequence of rhyolitic tuff and lava flows. The basal volcanic breccia displays characteristics suggestive of an intrusive relationship with the surrounding country rock. The overlying sequence of tuff and lava flows are characterized by textures and features indicative of subaerial eruption and deposition. Petrographic analysis reveals the Price Creek volcanic rocks contain phenocrysts and phenoclasts of quartz set in a glassy and hematite-rich matrix. In contrast, field observations of the Dillon volcanic rocks show that they occur predominantly as felsic lava flows that are commonly deformed into overturned flow folds characteristic of a high viscosity lava. Petrographically, the Dillon volcanic rocks contain abundant phenocrysts of plagioclase, which are often chemically zoned, biotite, and minor quartz set within a cryptocrystalline matrix.

Preliminary geochemical analysis revealed that the Dillon volcanic rocks can be classified as rhyolite on the basis of their total alkali (Na2O + K2O) vs. SiO2 content (Le Bas et al., 1986). The Price Creek volcanics however, exhibit unusually high silica contents and a significant depletion of most major oxides. The geochemical signature recorded in the Price Creek rocks may be the result of post-crystallization hydrothermal alteration. Tysdal et al. (1990) documented a period of major hydrothermal activity along the trace of the Jake Canyon fault during Late Cretaceous time. We suggest this event may have affected volcanic rocks of the Price Creek unit resulting in the silicification and depletion of the major chemical oxides. If the alteration of the PCu is related to the hydrothermal activity along the Jake Canyon fault, then the PCu must be at least Late Cretaceous in age, and could not be the result of the magmatic activity associated with the Eocene-age Dillon volcanic center.

Local Geologic Setting

The Blacktail Mountains occur within the Rocky Mountain Basin and Range province of the western U.S. Cordillera. The Blacktail range extends approximately 50 kilometers along a northwest-southeast trend and is between 5-6 kilometers wide (fig. 1A). The Blacktail Mountains are one of numerous basement-cored uplifted blocks that occur throughout southwest Montana. These uplifted blocks formed as a result of compressive stresses along the Jake Canyon fault during the Laramide Orogeny. The front of the
Blacktail range is marked by the Laramide-age Jake Canyon reverse fault and the younger Blacktail Deer Creek normal fault (Tysdal, 1990). The Blacktail Deer Creek fault is responsible for the recent uplift of the range and the present day topography.

The core of the Blacktail range consists of 2.7 Ga Archean metamorphic granitic gneiss and interlayered amphibolite which are intruded by several presumably Proterozoic (1.4 Ga) mafic bodies. In the northwestern portion of the Blacktail Mountains, the basement rocks are overlain by a thick sequence of Paleozoic and Mesozoic sedimentary rocks with Cenozoic volcanic rocks at the extreme north end (fig. 1B). However, in the southern portion of the mountain range these rocks have been eroded away with only Cenozoic volcanic and sedimentary rocks resting unconformably on top of the Archean gneiss. Following deposition of the sedimentary and volcanic rocks this region experienced several phases of brittle deformation and the development of several large scale faults (fig. 1C; Muller & Krol, 2004).

Field Relations and Petrographic Analysis

Dillon Volcanics

The Dillon volcanic rocks exhibit different field characteristics and mineralogical composition than volcanic rocks of the PCu. The Dillon volcanics represent a series of rhyolitic lava flows extruded from a volcanic center at the NW end of the Blacktail range approximately 41 Ma (fig. 1A & B; Fritz et al., 1989). The unit displays well developed flow banding (fig. 4A) with layers commonly deformed into overturned and recumbent flow folds (fig. 4B-D).

Petrographic analysis of the Dillon volcanic rocks illustrate these rocks contain abundant phenocrysts of plagioclase, biotite, and quartz. Plagioclase occurs as euhedral and tabular crystals approximately 2.0-5.0 mm in size. Plagioclase phenocrysts are commonly chemically zoned (fig. 4E). These crystals are often embayed indicating resorption in the magma chamber. Biotite occurs as long needle-like phenocrysts, 0.25-5.0 mm in size and commonly contain a rim of opaque minerals (fig. 4F). The matrix is composed of fine-grained quartz, microlites of plagioclase and flakes of biotite. The matrix is also composed of devitrified glass and displays pilotaxitic texture indicating that the groundmass was molten. Pilotaxitic texture is a texture that shows crystals in the matrix align and wrap around phenocrysts.

The Price Creek stream drainage contains rocks that display a more diversified stratigraphy than previously recognized. On the basis of our geologic mapping, we have identified a generalized stratigraphic sequence shown in figure 2. Archean metamorphic gneiss forms the crystalline basement of the range. Lying unconformably above the gneiss is a sequence of maroon colored volcanic rocks which we term the Price Creek unit (PCu). The PCu consists of two distinct lithologies; a basal volcanic breccia and an overlying interlayered sequence of rhyolite tuff and lava flows. Stratigraphically above the PCu is a previously unrecognized clastic sedimentary unit consisting of interlayered conglomerate, sandstone, and volcanic ash (Muller & Krol, 2004).

PCu Volcanic Breccia Characteristics

The PCu breccia displays sharp and irregular contacts with the Archean gneiss, contains xenoliths of the gneiss (fig. 3A), and numerous maroon veinlets cross-cut and intrude parallel to gneissic foliation (fig. 3B& C). The xenoliths within the breccia are typically 1-100 cm in size and consist mainly of granitic gneiss. These clasts are composed dominantly of microcline and quartz with minor biotite and muscovite mica.

Some of these clasts have small veinlets of chlorite. The breccia matrix is very fine-grained and largely stained by hematite. The total stratigraphic thickness of this unit is difficult to determine unequivocally but we estimate it to be a minimum of 10 meters.

On the basis of field observation (xenoliths, intruding veinlets) we interpret the basal breccia as intrusive into the
Archean crystalline gneiss. Thus, making its total thickness difficult to determine.

**PCu Tuff and Lava Flow Characteristics**

A sequence of alternating tuff and lava flows (fig. 3D) overlies the volcanic breccia everywhere within the study area. These rocks are ultra fine-grained with sparse phenocrysts and phenoclasts. The fine-grained rhyolites exhibit planar layering that has an average strike of N350E and a dip of 15-20°SE.

Petrographic analysis of the Price Creek volcanic rocks illustrate they completely lack hydrous mineral phases like biotite or amphibole. These rocks are dominated by phenocrysts and phenoclasts of mono-and polycrystalline quartz set in an ultra fine-grained matrix of quartz or devitrified glass. The tuffs are fine-grained and contain abundant fragments of euhedral to anhedral, angular to sub-rounded quartz along with lithic fragments (fig. 3E). Quartz exhibits undulose extinction indicating they are internally deformed and thus may be relict crystals derived from deformed metamorphic gneiss. These tuff units display broken crystals and uneven distribution, a typical characteristic of rocks derived from explosive eruptions (Allen & McPhie, 2003).

Petrographic analysis of the lava flow samples illustrate these rocks contain euhedral quartz surrounded by an ultra fine-grained matrix with tiny crystals of quartz (microlites) and glass. Microlites form as a result of syn-eruptive crystallization of the magma accompanied by slow cooling from high temperature following emplacement (Allen & McPhie, 2003). Quartz crystals commonly display a resorbed boundary indicative of the crystal reacting with a molten matrix (fig. 3F). The matrix also appears to display flow banding, also indicative of movement of a siliceous liquid.

**Geochemistry**

Whole rock geochemistry was applied to rocks of the Price Creek unit and the Dillon volcanics in an effort to characterize and compare or contrast their chemical compositions. Three samples of the PCu tuff and lava flows samples were used to compare them to samples collected from the Dillon lava flows. Samples of the PCu and Dillon rocks were crushed into cm sized fragments using a jaw crusher. The samples were powdered using a SPEX industrial mill/mixer with a tungsten-carbide ball. The powders were then fused into glass disks and were analyzed using X-ray fluorescence.

On a total alkali content (Na2O + K2O) versus silica (SiO2) plot (fig. 5), the Dillon volcanics fall within the rhyolite field and reflect typical igneous chemistry (table 1). However, volcanic rocks of the Price Creek unit display an unusually high SiO2 content and are largely depleted in total alkalis (fig. 5; table 1).

The extreme high SiO2 content found within the PCu, coupled with a severe depletion in all major oxides (with the exception of Al2O3) suggest the Price Creek rocks were affected by a post-crystallization hydrothermal event (fig. 6). Major hydrothermal activity has been documented along the Jake Canyon fault (Tysdal et al., 1990). Tysdal et al. (1990) mapped the presence of large deposits of hydrothermal quartz bodies (up to 20 meters thick) along the Jake Canyon fault as well as significant alteration of the adjacent basement gneiss.

On the basis of apatite fission track dates from altered and unaltered rocks (ranging between 60 to 74 Ma), Tysdal et al. (1990) interpreted the hydrothermal event could be no younger than the apatite dates. In addition, they obtained a 40Ar/ 39Ar whole rock date of 48.1 ± 0.3 Ma from an unaffected basalt flow that caps the altered gneiss, which they interpret as a minimum age for the hydrothermal activity.

**Conclusions**

A number of conclusions are drawn from our study:

1) On the basis of field and petrographic observations, as well as geochemical analysis, we interpret the Price Creek unit as a separate and distinct volcanic unit from the Dil-
Ion rhyolite. Field evidence shows that the basal unit of the PCu represents an intrusive breccia into Archean granitic gneiss. The breccia contains clasts of Archean gneiss suggesting it may represent a localized magmatic center. Additionally, small aphanitic veinlets cross-cut and intrude parallel to gneissic layering, indicating the basement rocks were invaded by a molten phase and not simply a location of deposition of pyroclastic material. Overlying the breccia unit is a sequence of fine-grained volcanic tuff and lava flows indicating a change from a shallow level intrusion to a more extrusive style eruption.

2) Compositionally, volcanic rocks from the Price Creek unit and Dillon rhyolite are distinct. The PCu contains abundant quartz phenocrysts that are commonly embayed, indicating interaction with a still molten liquid, and are largely devoid of hydrous mineral phases suggesting they derived from a relatively dry magma. In contrast, the Dillon rhyolite contains hydrous phenocryst phases like biotite suggesting a more "wet" magma. In addition, abundant zoned plagioclase phenocrysts indicate a more calcium rich parental magma than that of the highly siliceous Price Creek magma. However a more plausible explanation for the compositional diversity between the Dillon and the PCu might be the affects of post-crystallization hydrothermal alteration. Hydrothermal activity may have resulted in a removal of most major oxides and the significant silicification seen in the PCu. This hydrothermal activity may be related to movement along the Jake Canyon fault.

3) The age of magmatic activity in the southern end of the Blacktail range is uncertain. However, if the hydrothermal activity associated with the movement along the Jake Canyon fault is associated and correlative with the alteration of the PCu, then the PCu is most likely Late Cretaceous in age. In contrast, volcanism responsible for the Cretaceous in age. In contrast, volcanism responsible for the Dillon rhyolite occurred approximately 41 Ma (Fritz et al., 1989). If our hypothesis is correct, the PCu unit represents a previously unknown and undocumented magmatic center that erupted in this portion of the Rocky Mountains.
References Cited


Table 1. Major oxide and trace element whole-rock geochemical data for the Dillon volca

Sample # | SiO₂ | TiO₂ | Al₂O₃ | Fe₂O₃ | MgO | CaO | Na₂O | K₂O | P₂O₅
---|---|---|---|---|---|---|---|---|---
DV-4-0470.102 | 0.17 | 14.656 | 1.548 | 0.007 | 1.254 | 4.471 | 4.823 | 0.034 |
DV-6-0472.034 | 0.175 | 15.242 | 1.631 | | 1.246 | 4.305 | 5.105 | 0.046 |
PCV-6-04 | 81.734 | 0.621 | 12.465 | 2.361 | | 0.328 | 0.192 | 0.435 | 0.135 |
PC-11-04 | 84.066 | 0.158 | 11.009 | 1.008 | | 0.146 | 0.028 | 0.188 | 0.011 |
PCV-15-04 | 86.964 | 0.086 | 9.513 | 0.009 | | 0.144 | 0.074 | 0.156 | 0.018 |
PC-50c-05 | 86.996 | 0.302 | 6.124 | 1.836 | | 2.076 | 0.159 | 0.425 | 0.009 |

Sample # | V | Rb | Sr | Y | Zr | Zn | Ba | Mn
---|---|---|---|---|---|---|---|---
DV-4-047.00 | 191.00 | 362.00 | 33.00 | 339.50 | 102.50 | 2008.00 | 315.00 |
DV-6-043.00 | 180.90 | 374.40 | 33.00 | 347.80 | 106.90 | 2110.00 | 242.00 |
PCV-6-04 | 110.80 | 115.69 | 367.10 | 35.71 | 280.28 | 104.30 | 97.00 | 0.00 |
PC-11-04 | 10.90 | 135.30 | 241.00 | 39.00 | 426.00 | 94.90 | 33.90 | 92.50 |
PCV-15-04 | 143.60 | 271.00 | 40.00 | 424.30 | 103.00 | 18.50 | 91.00 |
PC-50c-05 | 48.63 | 146.90 | 224.97 | 26.00 | 226.25 | 120.02 | - | - |

Trace elements reported in parts per million (ppm)

Figure 1A. Location of Blacktail Mountains and field locations for Price Creek and Dillon volcanic units.
Figure 1C. Geologic map of the SE portion of the Blacktail Mountains, Montana. Mapping of the Price Creek volcanic unit based on work of Muller et Krol, 2004; Roje et Krol, 2004.
Figure 1B. Portion of the 1:24,000 Dillon West 7½ minute quadrangle showing sample locations of Dillon volcanic lava flow used in comparison with Price Creek volcanic rocks.
Generalized Lithologic Column
Price and Teddy Creek Area

- Unconsolidated alluvium and colluvium, numerous landslide deposits along lower Teddy Creek

- Six Mile Creek Formation - quartzite gravels and sands, locally silica cemented

- Renova Formation - tuffaceous mudstone and sandstone, poorly consolidated

- Teddy Creek Formation - arkosic sandstone, pebbly sandstone, chert/quartzite-pebble conglomerate, mudstone, silicified rhyolitic tuff

- Price Creek Volcanics - upper discontinuous pebbly mudstone (lahar?), crystal and crystal-lithic rhyolitic tuff, basal rhyolitic flow breccia with pebble to boulder sized metamorphic basement clasts intrusive breccia dikes

- Quartzofeldspathic gneiss with minor amphibolite, metasediments and ultramafites

Figure 2. Generalized stratigraphic column showing the units present in the southern portion of the Blacktail Mountains.
Figure 3. A) Typical basal, maroon colored breccia of the Price Creek unit. Clasts consist mainly of granitic gneiss and crystal fragments. B) Small aphanitic veins intruding basement gneiss. C) Contact between Archean gneiss and Price Creek breccia is nearly subvertical. D) Fine-grained volcanic tuff and lava flow unit that overlies the breccia unit. Note the possible presence of vesicles. E) Photomicrograph of Price Creek tuff. Note small lithic fragment and angular quartz crystal fragments (PPL). F) Embayed quartz phenocryst in a darkened glassy matrix from a lava flow layer (XPL).
Figure 4. A) Flow banding in Dillon lava flow. B) Layering and large overturned flow folds in Dillon lava. C & D) Recumbent flow folds in Dillon lava flows. E) Zoned plagioclase phenocryst within a finer-grained groundmass of plagioclase, quartz, and biotite (XPL). F) Biotite phenocryst set in a glassy matrix and finer-grained biotite groundmass. Note the radiating nature of crystallites in matrix (PPL).
Figure 5. Total Alkalis versus SiO₂ diagram for the Dillon volcanic rocks and the Price Creek unit. Dillon rocks plot as a typical rhyolite whereas the Price Creek rocks plot at extremely low alkali contents and high silica (LeBas et al., 1986).
Figure 6. Major oxide versus SiO2 diagrams for the Dillon volcanic rocks and the Price Creek unit. Dillon rocks display typical igneous chemical signatures whereas, the Price Creek unit displays a significant depletion in most major oxides and much higher concentrations in SiO2 content.
Problems with Steve Pinker's Mentalese: On the Implications of Bilingualism

BY MARINO FERNANDES

Introduction

I have different concepts I use depending on the language I am speaking. In Cape Verdean creole, there is the concept of morabeza—one that speaks of the culture's attitude toward all people. It teaches us to walk the street with an open heart, a smile and spirit to help the next man. As my father still tells me: "When you meet people remember to show them your morabeza, and you will see the relationship flourish smoothly." It is the idea of hospitality without expectation of return, without worry of one's own resources. It is also the spirit of bonhomie, of universal friendliness. This is an attitude that one takes, the way one conducts oneself—implicitly. Although this is the basic idea, we do not have a word in English that precisely mirrors it.

In this paper, I want to consider the claim that not all languages have the same power to express the meaning that the speaker intends. Examples like the one above give us an idea of the phenomenon; I will be looking at some other examples in detail later. I will argue that this is because there are concepts that are culture-specific in as much as language is a vehicle for the culture. To understand what I mean by culture-specific concepts, let us consider the Portuguese concept of Saudade. The best way to explain this idea is to synthesize the ideas of melancholy, nostalgia, homesickness, filial love, immigration and a spirit of longing for the sailors and explorers of the 15th century into a cluster of concepts. Although it can be explained to people so that a fairly close understanding is reached, there is something about that concept that is ineffable to persons unfamiliar with the Portuguese way of life. This long-winded grocery list would not be necessary were I giving this paper to a room full of my compatriots. It is something that is understood. To be Portuguese is to be well acquainted with this concept. This suggests that along with membership in a culture comes a package of concepts. Moreover, these
concepts are not shared cross-culturally. It has long been understood that language is a powerful tool for cultural conservation. Part of what it is to be a member of a given community is to speak the language in the ways that the members of that culture do. This suggests the idea that language is a vehicle for culture, especially with regard to such culturally rich and specific concepts like those I mentioned above.

The questions I have been shaping are as follows: Do the concepts we acquire depend on the culture we live in? Or does acquisition of any language guarantee that we have certain concepts? In *The Language Instinct*, Steve Pinker argues the latter. This position stems from linguistic nativism, which I will discuss below. In the end, I think we will see that Pinker's nativism seems to work well for most concepts; although it is not clear how distinctive cultural concepts fit it, it may be possible to decompose them into basic notions common to all language users.

**Pinker and Nativism**

Nativist theories of language all argue that our capacities to understand and produce language are innate, or built-in. Before the revival of nativism, behaviorism was the leading account of language and its development. Behaviorist theories explained language acquisition and development with a series of stimulus-response patterns ultimately resulting in a 'storage bin' theory—where children store phrases that they are exposed to in the environment and call upon them when the situation arises. This view's infrastructure was determined by principles like operant conditioning. A plausible example of the behaviorist model of language acquisition might look like this: a baby says "da da" in the presence of Daddy, and the parents show their approval. Gradually, parents make their approval contingent upon increasingly accurate and complex utterances.

For Pinker, human language is not learned but something that is a feature of our design just as much as our upright posture. He purports that "humans know how to talk more or less in the sense that spiders know how to spin webs" (Pinker, 18). Furthermore, his view of language in this way seeks to disabuse his readers of the notion that language is some kind of cultural invention. He wants us to think of language as another feature of our design that is complementary to our success and survival in our environment. In other words, bats use echo-location to help them navigate their environment and Pinker says that language is an evolutionary adaptation of this sort—"a biological adaptation to communicate information" (Pinker, 19). As such, it follows that this capacity would be qualitatively similar in any healthy human beings. The fact that we use language to communicate is no different than the idea that we use our legs to walk or that birds have wings for flying. Fundamentally, Pinker’s nativism comes from a deeply found correlation between form and function.

Pinker’s approach to language is heavily influenced by the work of the eminent linguist Noam Chomsky. Chomsky disputed behaviorist theories and spearheaded the revival of linguistic nativism by calling our attention to two fundamental facts about language: 1) we have an unlimited capacity to understand sentences in natural language—for in any language there is an arbitrarily large number of possible sentences; we are exposed to sentences that we have never heard before, but have no problem understanding and processing them. This forcefully suggests that language cannot be a repertoire of pre-packaged responses—the brain must have some mechanism to build an unlimited set of responses from a limited vocabulary. He called this Universal Grammar. 2) Children develop this grammar rapidly and without formal instruction while giving consistent interpretations of novel sentences that they never encountered.
Chomsky proposes a grammatical analysis of our understanding of language that purports to explain how it is that we understand sentences the way we do. Consider for example, the two phrases:

1) John is eager to please.
2) John is easy to please.

On the surface, the two sentences share the same structure consisting of a subject (John), predicate (is), modifier (eager/easy), and infinitive (to please). How do we know that their meanings are different? Chomsky suggested that their meanings are revealed by their deeper structures. In sentence 1, John is the subject. He is the one who pleases. In sentence 2, John is the object; others please him. As we can see, it would be very difficult for our parents to teach us such a distinction at 4 years of age. Natural languages have different surface structures but share the same deep structure. This may raise questions because not all natural languages have the same structure. Consider the following:

3) John hit Bill. (Bill is the one hit, not the hitter)

In Japanese it would look something like this: John Bill hit. English and Japanese are examples of 'head-first' and 'head-last' languages respectively. In Japanese, the ordering is different but there is a way to disambiguate the agent of the action from the recipient of the action. In English, order matters, so we use ordering for disambiguating subjects from objects, but in many other languages order is less important; so there are other grammatical rules at work to help us make sense of sentences. And this is too hard to learn, so we do not learn it. This is where Pinker's nativism can help us make sense of such difficult phenomena, especially bearing in mind that children begin to master these ideas by the age of five or six years.

Challenges for Mentalese

One of the objectives in Pinker's introduction of Mentalese was to debunk the idea that people think in different languages. Pinker argues that Mentalese is the language of cognition, and also the 'translator' of mental events. To draw an analogy with a computer: Mentalese is our operating system working as deeply as the computational level which serves as the translating device for our (verbal) output monitors.

Nativism has enjoyed a large following, and, as we have seen, there is much empirical evidence in its favor from many fields. However, I see a need for some qualifications in the present conception of Mentalese with respect to bilingual speakers. If Mentalese is true, then it follows that concepts appearing in all languages must come from the same conceptual base. Along with my grandmother—an avid defender of the 'Portuguese sensibility'—I will suggest that this cannot be all there is to the story. I will look at some cases from bilingualism to see if such speakers seem to be drawing from separate conceptual bases or whether different languages have their foundations in one set of concepts.

All About Bilingualism/ tudo sobre bilingualismo

All along I have been talking about the difficulty of expressing cultural concepts to people that are not active members of that culture. Although this may say something about the expressiveness inherent in natural languages, it points only indirectly to the problem of mentalese.

It is obviously very difficult to have conversations about phenomenal properties of cultural concepts—especially when the parties involved are not members of the same culture. The problems presented by bilingualism are particularly interesting because they posit the problem...
in a different light. They avoid problems of access to others’ consciousness and address problems of Mentalese within the same person. This is where I find the real puzzle. It is all too easy to dismiss the questions I have raised by pointing out that interpersonal communication is complicated because it involves many complex processes—cultural experience, personal maturation, varying levels of eloquence in verbal behavior etc.

By positing the problem within the same person—a person like myself who is functionally fluent in more than one language—we can escape such a criticism.

With the concept of *saudade* then, it is clear that I know the concept for I grew up with it and use it in sentences without evoking faces of bewilderment from other Portuguese speakers. The problem is evident when I try to find an English cognate that explains the concept to myself. Somehow I lose something. I have to engage in a program of verbal acrobatics to even think about the concept in the right ways. (For one can have *saudades* or feel *saudades*) For an illustration of this please refer to Fig. 1 in the Appendix.

One popular analysis of bilingualism is that there are multiple conceptual bases from which bilingual speakers draw their concepts. In other words I would have one English-Mentalese track where my English verbal behavior happens and a Portuguese-Mentalese track where my Portuguese verbal behavior happens. This may explain why we have such hard time trying to convey such ideas cross-culturally. Linguists offer one way of understanding how this cross-linguistic capacity works through an explanation of the phenomenon they call code switching.

Code switching requires a high degree of proficiency in both languages. Code switching is the selection by bilinguals (or multilinguals) of forms from an embedded (L2) variety (or varieties) in utterances of a matrix (L1) variety during the same conversation. Code switching can be intersentential (occurring between sentences) or intrasentential (occurring within the same sentence or sentence fragment). Code switching of languages offers bilinguals a way to increase their flexibility of expression going beyond the style-switching of monolinguals. That is, switching is a means to index the nuances of social relationships by exploiting the socio-psychological associations of the languages employed” (Myers-Scotton, 1992). Research suggests that there is this relationship between matrix and embedded languages. During the L2 acquisition the speaker will economize efforts by attaching the new embedded language concepts to concepts he/she already knows in the matrix language. Consider for example what would happen in a Spanish (ML) native during English (EL) acquisition: chair is linked to *silla*, water to *água* and so on. For an illustration please refer to Fig. 2 in the Appendix.

This suggests that there are two parallel conceptual bases working at any time. The question that remains is: what happens when there is no arrow pointing from the L2 expression to something in L1? There is NOT a failure of understanding, so the concept HAS to come from somewhere. Two possibilities:

1) There is some more basic set of concepts found in Mentalese from which all of the concepts in L1 and L2 can be composed. This supports Mentalese.

2) There is an alternative set of concepts in L2 only acquired through learning L2—this suggests that Mentalese is false.

The way to determine which is true requires both making clear the logical form of the system of representation of Mentalese and testing it empirically by looking at cases of uniquely expressive phrases in other
languages. In a summer project, in 2005, I pursued both of these avenues. For now, let me say that we may have to posit two parallel mentalese structures; Pinker mentions this: “it could be that English speakers think in some kind of simplified annotated quasi-English and that Apache speakers think in some kind of simplified and annotated quasi-Apache with the design I have just described” (Pinker, 82). If this is true, it seems to undermine mentalese.

**Conclusion**

I have pointed to some cases from bilingual experience that suggests a special expressiveness inherent in each language. I have also considered whether bilingualism operates on parallel conceptual bases or if it emerges from an even more basic combinatorial system. I have done this to point to the conceptual implications that bilingualism brings to theories of Mentalese; and as preliminary work to help frame questions that need to be addressed in an interdisciplinary exploration I engaged in last summer. Although bilingualism’s place is not clear in the Mentalese thesis, nativism seems to give us strong reasons to accept it as true.

**Appendix**

**Fig. 1**

\[
\begin{array}{c}
\text{PORTUGUESE} \\
\text{MENTALESE} \\
\text{COMPUTATIONAL}
\end{array}
\quad
\begin{array}{c}
\text{ENGLISH} \\
\text{MENTALESE} \\
\text{COMPUTATIONAL}
\end{array}
\]

Note that there is no problem in the translation from the computational level to the natural language. The problem is evidenced in the attempt of cross-cultural translation.

**Fig. 2**

(L1) Esp. Mentalese

| Silla | Agua | ? | ? |

(L2) Eng. Mentalese

| Chair | Water | Nice | Gnawing Pain |

This suggests that there are two conceptual bases working at one time.
Bibliography of Works Consulted


The Scientific Aspect of Melodrama: The Mind/Body Connection in the Late Eighteenth Century Seduction Novel

by Nichole Wilson

Charlotte Temple and The Coquette belong to a group of books that, according to Jane Tompkins, is alleged by twentieth century criticism to "present a picture of life so oversimplified and improbable, that only the most naïve and self-deceiving reader could believe it" (152). In his book, Love and Death in the American Novel, Leslie Fielder calls this sentimentalism in literature the dissolution of the Age of Reason "in a debauch of tearfulness" (38). As a result, the works of Susanna Rowson, author of the 1794 American novel Charlotte Temple, and Hannah Foster, author of 1797 American novel The Coquette, among other female writers, are called "flagrantly bad best-seller[s] before the [arrival in America] of the serious successful novel" (93).

In her book Sensational Designs, Jane Tompkins argues that the domestic novel can stand up on its own merit. I would add that these novels and their predecessors, the late eighteenth century seduction novels, can even stand up to the Twentieth Century critics, because the sentiment in these novels does not contradict the pragmatics of the Enlightenment. In fact, one particular facet of scientific discourse makes the melodrama of the late eighteenth century seduction novel seem not only reasonable but probable. In The Coquette, for example, Eliza's "disorder of the mind" causes her physical demise, suggesting a causal connection between her mind and body. This mind/body connection was a topic of discussion for Enlightenment thinkers, and both Charlotte Temple and The Coquette, whether purposefully or accidentally, present a scenario that challenges the twentieth century criticism that allege sentimental fiction "presents a picture of life so oversimplified and improbable, that only the most naïve and self-deceiving reader could believe it" (Tompkins 152) – a naïve reader, no, but perhaps a reader of philosophy.
When most readers hear the name René Descartes, they most likely recall his famous declaration from *Discourse on Method*, published in 1637: "I think therefore I am." However, Descartes' theories about existence went as far as to establish what Dr. Robert Wozniak of Bryn Mawr College calls "the first systematic account" of the relationship between the mind and body, a subject reaching as far back as classical philosophers and as far ahead as today. This system, called Cartesian dualism, is based on the idea that the activities of the mind have an effect or consequence on the activities of the body and vice versa. It is this system of causal interaction that is especially present in the novels *Charlotte Temple* and *The Coquette*.

In order to demonstrate Cartesian dualism's presence in these novels, I'd like to take a moment to summarize it. Descartes believed that although the soul is united to the whole body, its main seat is in a small gland in the brain called the pineal gland (Passions 46). This, he said, is what people mean when they refer to the heart, also known as the seat of passions. The reason why the pineal gland has been mistaken for the heart organ is because we feel passion there via the nervous system. Thus, according to Descartes, not only does the mind receive messages from the body and cause emotions but the soul seated in the mind "radiates forth [in the] animal spirits, nerves, and even the blood" of the body (47). Descartes did not say exactly how the soul radiates forth in the body, and Robert Wozniak calls Descartes' theory a legacy, which created, in his words, "intellectual chaos." New theories about the mind and body relationship cropped up during the Enlightenment; although not all could agree just how this connection is possible, most agreed that the mind and body were connected in some way. The idea of this relationship — specifically Descartes' version — seems to have been also taken to heart by writers of literature who used their imaginations as to what the theory in action might look like.

Just as the exact nature of the connection between the mind and body remained ambiguous to men of the Enlightenment, it is unclear what the exact nature of the connection between these men of science and nineteenth century women writers is. Nonetheless, I will now talk about ways in which this connection might have been possible. According to Nina Baym, nineteenth century and even late eighteenth century American women would have had access to science, which was much more a part of popular culture than it is today, since it was easily read by an educated person.

During this time, women had access to scientific books from libraries or their home collections and circulating journals. They could also attend scientific lectures. Thomas Woody, a scholar of women's education, has discovered that women's schools offered a wide range of scientific textbooks (qtd. in Baym 5). Although his earliest finding reaches only as far back as 1798, evidence has been uncovered of English women's interest in science dating back to the seventeenth century. Baym suggests that this study is far from being over, and that more evidence of women involved in science will be uncovered in the future.

Women did not just have access to science. Nina Baym observes that women were, in fact, the agents for disseminating it (8, 14). She notes that in the circulation of science, *New England* women were the most active of all American women. Throughout the nineteenth century New England women were those with the "highest literacy rates and the most education of any group of women in the nation" (17). Robert Bruce studies Massachusetts' heavy production of science, observing that by 1850, "Massachusetts produced more than 20% of the leading scientists" (Baym 17). Interestingly, both Rowson and Foster lived in Massachusetts, so they would have had a high level of literacy and education and been exposed to some of the latest scientific advancements.

Susanna Rowson, author of *Charlotte Temple*, was born in England in 1762. She spent most of her childhood in New
England, where, according to Cathy Davidson, she received the education of "gentility" (xxi, xxii). The Rowson family returned to England when Susanna was sixteen. In 1793, Rowson returned to America, and four years later opened a Young Ladies' Academy in Boston. It was considered "one of the finest available" and taught using a progressive curriculum that included geography and science (xxvi). In fact, Rowson wrote her own geography textbook in 1805. Would anything in Rowson's life have made her familiar with the Cartesian mind/body theory? That much is not obvious from her biography, but what is clear is that Rowson was a very educated woman, and her text reflects the Cartesian mind/body theory throughout, as I shall demonstrate later.

According to Herbert Ross Brown and Elaine K. Ginsberg, much less is known about Hannah Webster Foster (Brown 651; Ginsberg 72), but it is known that Foster lived in Massachusetts, attended a boarding school and married a minister (Brown 650). As a minister's wife, Foster might have listened to the "pedantic conversations of scholars," as Sanford's warning to Eliza in *The Coquette* seems to indicate (Foster 50). In addition, to quote Ginsberg, "numerous historical and literary allusions in [Foster's] books suggest that she was well educated for her time and sex" (72). Although it is even more difficult to say whether or not Foster would have been familiar with Cartesian dualism, Foster's *The Coquette*, like Rowson's *Charlotte Temple*, shows a similar pattern in reflecting this mind/body theory.

Since both Rowson and Foster fall into the category of educated women who had access to science, it is not surprising that both of their novels contain a strong presence of Cartesian dualism. In both *Charlotte Temple* and *The Coquette*, characters who become mentally distressed often become ill by degrees up to and including death, depending on the amount of mental anguish they experience. In *Charlotte Temple*, Lucy, the main character's mother, is merely "fa[de[d... by the... ] affliction" of her family's sad history (14), because she has more "health and spirits" (20), but her poor mother, "weakened by illness and the [same] struggles," apparently has not been so fortunate. She is "not able to support [the] shock," and as a result, falls "into a strong convulsion, and expire[s] in about two hours" (19). Likewise, we see a progression in Charlotte herself as first she is exhausted on her voyage away from home (59), then besieged by fever upon finding out that Montraville, her seducer and the father of her child, has married another (98). A series of more distressing events - eviction, childbirth and a reunion with her father - ultimately demolish Charlotte's life.

A look at the language in which these events are described further suggests the Cartesian theory that the soul radiates forth in the body. The presence of Cartesian dualism in this novel would mean that the so-called emotional reactions are not in opposition or alternative to the Enlightenment, but a demonstration of participation in it. Take the example of Lucy, who is first described to us when Charlotte's father, Mr. Temple, goes to the home of his future wife, Lucy. The narrator says, "She [i]s as fair as the lily, but sorrow ha[s] nipped the rose in her cheek before it [i]s half blown" (13). Although she could be using poetic device, the narrator does not say that it is *as if* sorrow had nipped the rose in her cheek, and that the two had coincidentally changed together. The narrator implies that the soul has had an actual impact on the body, and again suggests this further on in the text.

While observing Lucy, Mr. Temple says "the rose of youth and health soon fades when watered by the tear of affliction" (14). The most explicit evidence of this idea is given to us when the narrator explains why Mr. Eldridge's body seems youthful while his mind is in expectation of seeing his granddaughter, Charlotte: the narrator states, "so much do the emotions of the soul influence the body" (48).

Foster, too, demonstrates Cartesian theory. Recounting a broken engagement, Eliza says, "the exercise of mind, and conflict of passions, which now tortured my breast, were too much for me to support!" Since Eliza describes a state of the
soul, if a reader were a Cartesian, he or she would expect what happened next: her body reflected this state of the soul. Thus we see the soul, in Descartes' words, "radiating forth" in Eliza's body: when she sees that Rev. Boyer, her ex-fiancé, has left the room and "actually forsaken [her]," she faints (93).

Even though Sanford, Eliza's scandalous love interest, claims that he has been told Eliza's "indisposition [...is] purely mental," he, too, notices "her pale dejected countenance, with the sedateness of her manners, so different from the lively glow of health, cheerfulness and activity which formerly animated her appearance and deportment" (125). Sanford talks not just about Eliza's inclination to behave a certain way, but her "health" and "appearance" which imply her physical health. Later he says that "absolute distraction seized the soul of Eliza, which has since terminated in a fixed melancholy. Her health is too much impaired...and I tremble when I see her emaciated form" (140)! Eliza's friend Julia agrees with her self-diagnosis that she is ill, and so offers to "be [her] physician." I would like to point out a difference between the expected treatment and the prescribed one, because I want you to see Cartesian dualism at work in the text. What sort of treatment does Julia offer Eliza? Bed rest? Healing herbs? A hot bath? No, Julia offers "company, and change of air," to lift her spirits (138). Here, we see that the soul cannot only have a negative effect on the body, but can have a positive one as well. Unfortunately for Eliza, Julia is not able to lift her spirits. Having given in to Sanford, Eliza is ashamed. Her shame leads to grief, this grief "undermines [her] constitution. [Her] health [falls] sacrifice to a disordered mind" (146)."
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---. "Republican Motherhood." *Historical Dictionary of Women's Education in the United States*.


End Notes

In an article from *The New York Times* that ran this February 18, Linda Johnson covered the phenomenon of “heart break syndrome,” in which the “sudden death of a loved one can really cause a broken heart,” evidenced by “heart-attack symptoms doctors at Johns Hopkins School of Medicine.” New England Journal of Medicine published a study that distinguished between what they dubbed “heart break syndrome” and a heart attack. “Dr. Daniel Shindler, director of the echocardiography lab at Robert Wood Johnson Medical School in New Brunswick, N.J., said... the researchers offer the first explanation he has heard for the phenomenon and their conclusions make sense, given the well-known link between the brain and heart.”

As a Dualist (Vesey, Preface 13), Descartes believed that the mind and body are two different substances that are “conjoined.” He defined the mind as the intelligent substance that feels, imagines, wills and conceives ideas. The body is the corporeal or extended substance that has figure and the ability to move (Descartes, Meditations 28, 29).

While occasionalism is the belief that God either effects both the body and mind or has created the two to be in harmony with one another, and parallelism is the belief that the activities of the mind and body occur in harmony without any third cause, such as God (Wozniak). Other schools of thought had to do with the question of substance, and whether or not the substances of the mind and body were one and the same (e.g. Dualism versus Monism). There is also epiphenomenalism, interactionism, dual-aspect monism, and mind-stuff theory.

Probably message-carrying chemicals.

Although the term “scientist” was not yet in use, science was the realm of philosophers or “men of science” (Baym).

As Finseth argues, “Foster suggests the inadequacy of rhetoric for guiding one’s actions” (15). Rowson does the same, not necessarily within her plot, but by merely using the same style device as Foster – melodrama. The result of melodrama is that in the late eighteenth century seduction novel, the authors do not have to rely on abstract words, but can “show” their stories through physical action to extract a stronger feeling from readers.

Portrayal of the mind/body relationship functions in these novels to conveniently allow the effective use of melodrama as a didactic tool. The physical action in the novels portrays the lesson they have to teach other than
simply stating them. This melodrama works to move the audience to feel for the characters (Brunjes 9/21/04) rather than being told to feel for them. When a character becomes fatally ill because of the guilt of a sin, for example, it serves to "teach" the character "a lesson," thereby adding support for the moral of the story. When a character becomes ill because of a wrong done to him or her, it serves to build sympathy for that character. An example of the former is the death of Madame La Rue, who is responsible for leading Charlotte astray. The misery that she experiences as a result of her vice is experienced in conjunction with a fatal illness, and her death is "a striking example that vice...in the end leads only to misery and shame" (120). We readers, of course, are not supposed to feel sorry for Madame La Rue. We are supposed to feel that justice has been done and agree with the lesson.

Charlotte’s death, on the other hand, is more of an “untimely fate” (118). While it is true that Eliza is a much more complex character than any in Charlotte Temple, her death is still a melodramatic device to teach a lesson. Eliza is still held culpable for her actions, but the way in which she bore her penalty is considered admirable. On one hand, Lucy Sumner says that Eliza has “erred” (167) and warns “the American fair” to heed her story; on the other hand, the “calm resignation” to which Eliza met her punishment is memorialized on her tombstone (169).
We Don't Need No Water: Joyce and O’Brien Burning the Roof of High Art

BY ROB CANNATA

Rob wrote this piece for Dr. Garland Kimmer’s Irish Literature I class and presented it at the 2005 National Conference of Undergraduate Research. Rob recently graduated with a B.A. in English and intends to pursue his writing, though it often seems to outrun him.

Canonical authors — Spenser, Tennyson, Dickens, the like — are representative enough of their eras to have become landmarks of their time. The Modernist James Joyce stands in this league, approaching the likes of Shakespeare and Dickens in his fame. Joyce is mostly known as unapproachably dense in his knowledge in writing; a running joke among Joycean scholars is that only about twenty of them have actually read *Ulysses* all the way through. This perception of Joyce as intellectually challenging has placed him in the category of “high art” — fodder for the educated elite. But in much of his work, Joyce himself ridicules the concept of “high art,” mocking the existing artistic value systems of his time and upsetting the very prestige the intellectual community gives him. The later Irish writer Flann O’Brien, who has been placed in a similar category by the postmodern literati, rebels against this same value system by using similar tactics. By juxtaposing the low and high realms of art, Joyce and O’Brien undermine the structure of cultural value imposed by their British overseers.

Walter Pater’s essay, “Aesthetic Poetry,” helps to define the Late Victorian classifications of low and high art (Joyce’s artistry flourished in the Modern period, but he grew up in a time frame dominated by Late Victorian thought). Pater states of poetry, “It is a finer ideal, extracted from what in relation to any actual world is already an ideal. Like some strange second flowering after date, it renews on a more delicate type the poetry of a past age, but must not be confounded with it” (95). For Pater, poetry builds upon past themes in new contexts. With this he suggests that a reader must be properly versed in past literature before poetry can have significant meaning, and so the poet and reader are bound to the high art canon, only able to refine and perpetuate the spirit of the canon.
Matthew Arnold puts other bonds on poetry in his "The Study of Poetry." He states that "the best poetry is what we want; the best poetry will be found to have a power of forming, sustaining, and delighting us, as nothing else can. A clearer, deeper sense of the best in poetry, and the strength and joy to be drawn from it, is the most precious benefit." (1535). Again, key words like "forming" and "sustaining" imply an existing value structure that must be built upon and gradually refined until a "clearer, deeper sense" of poetics is achieved. To Arnold, artists build in aim of a specific goal: understanding. This understanding must be refined and clean, created with an ideal of evaluated aesthetic perfection in mind.

Pater and Arnold preach a structure that Joyce and O’Brien rebel against, while the Irish writers’ works are placed into this same canonical structure. As Irishmen, Joyce and O’Brien were subject to the imposition of this Victorian value system through colonization and undermine it by exposing its unrealistic portrayals of truth, culture, and understanding.

Stephen Dedalus is, to Joyce, the typical high art elitist. When we leave Stephen in A Portrait of the Artist as a Young Man, he is brimming with idealistic ambition: "Welcome, O life! I go to encounter for the millionth time the reality of experience and to forge in the smithy of my soul the uncreated conscience of my race." (Portrait 218). How Stephen, a Jesuit-educated man of letters, can relate to the Irish poor, never mind create their conscience, is not answered. Stephen has created an aesthetic barrier between himself and low Irish culture. Take his opinion of his father, Simon. As a quiet witness to Simon and his drunken cronies, Stephen reflects condescendingly, "His mind seemed older than theirs: it shone coldly on their strifes and happiness and regrets like a moon upon a younger earth. . .He had known neither the pleasure of companionship with others nor the vigour of rude male health nor filial piety." (Portrait 93). Stephen's sense of aesthetic cleanliness gives him a feeling of superiority — a modernist, elitist pursuit of ultimate truth — that carries him idealistically through Portrait. Stephen's aesthetic cleanliness isn't echoed by his physical state — we learn early in Ulysses that, in a symbolic rejection of his baptism, Stephen hasn't bathed in months (Blamires 6). The juxtaposition of physical filth and mental purity could be Joyce's attempt to chip at Stephen's conception of himself.

Stephen's indignation continues in Ulysses. Buck Mulligan, friend and temporary host, playgroundly criticizes Stephen's self-importance, which infuriates Stephen. After a minor argument, Mulligan ridicules Stephen's dramatic pensiveness and offense, stating "Don't mope over it all day. . .I'm in consequent. Give up the moody brooding." (Ulysses 8). Mulligan also pokes fun at Stephen's high-minded theory on Shakespeare's Hamlet and the self-importance of academics in general: "It's quite simple. He proves by algebra that Hamlet's grandson is Shakespeare's grandfather and that he himself is the ghost of his own father." (Ulysses 15). Stephen chimes in his one-word appraisal of Buck at the end of the "Nestor Episode: "Usurper" (Ulysses 18). Buck is an affront to his quest for artistic and ultimate understanding ("Hast thou found me, O mine enemy?" [Ulysses 162]). Of course, when Stephen finally discloses his full theory of Shakespeare in "Scylla and Charybdis," he is asked:

—Do you believe your own theory?
—No, Stephen said promptly. (Ulysses 175).

Stephen's inability to believe his own intellectual work further unsettles his pursuit of an ultimate aesthetic or truth.

Through Stephen, Joyce, is ridiculing the claim of objective, pure understanding. Compare Stephen's view to that of T.S. Eliot, the quintessential modernist, on "the idea of classicism," or a tendency "toward an higher and clearer conception of Reason, and a more severe and serene control of the emotions by Reason" (qtd. in Donoghue 21-22). To Joyce, such clarity is a myth, and without such clarity the concept of one discourse or argument being "higher than another is questionable. Joyce seems to feel that high and low culture are not as dissimilar as the pretentious would think.
In *Ulysses as a Comic Novel*, Zack Bowen comes to a similar conclusion of Joyce's juxtapositions of high and low: "The comic universe (of *Ulysses*) is... a world where the plights of the characters invite instant, everyday identification and where the crude and the sublime exist side by side (10). Alongside Stephen's sublime argument is his own disbelief; alongside the sublimity of his audience of scholars is the crudity of their self-important pride in dead words and ideas. In this topsy-turvy world the establishment of elitism and canonical knowledge is a highly flawed one.

Bowen relates these juxtapositions to a greater theory of Joycean value. By refuting and mocking both the high and the low in equal parts, Joyce "tells us that the mundane and trivial are all right, that they are the stuff that human experience is really all about, and that insignificance is not shameful" (69). Joyce asserts the importance of the low to be equal to that of the high, and the artistic value system crumbles. Furthermore, Joyce gives us a role model who lives outside the system: Leopold Bloom "does not hanker after an ultimate discourse: he has instead a wry, curious, observant play of mind that is attentive to discourse and is usually unthreatened when the discourse is superior to his own" (Maddox 139). By refusing to feel inferior in the face of a more "authoritative" discourse, Bloom saps its power to make him an inferior subject. Stephen, who still struggles to attain the status of high artists (therein admitting his current identification as an inferior artist) frets over Buck's jabs and conceptualizes himself as a failing, frustrated human being instead of a content, caring human being like Bloom.

A prime example of bumbling Bloom taking on the world of high art comes only ten pages after meeting him. Sitting on his toilet, Mr. Bloom ponders over Macham's Masterstroke, a "prize titbit" in his morning paper. Inspired by its wit, he considers doing a similar study on his wife Molly. This leads to reminiscing and thoughts of Molly's adulterer-to-be Blazes Boylan. He soon forgets all about the article before him. In fact, to make Joyce's point, he uses it as a handy piece of toilet tissue before heading off for this morning errands (*Ulysses* 55-56). The moralizing story may be smart, but it does little to resolve Bloom's dilemmas and finds its final use among the rest of the refuse: read, digested, pondered, and excreted by Bloom. In addition to this commentary on literature, the very concept of having a character use a toilet "on screen" is emblematic of Joyce's attempt to rail against the confines of high art.

Flann O'Brien was heralded, much to his chagrin, as the heir apparent to the Joycean throne. He once proclaimed, "If I hear that word 'Joyce' again, I will surely froth from the gob!" (*At Swim, Two Birds* v). O'Brien's novel *At Swim, Two Birds* is regarded as one of the best postmodern metafictions — that is, a book that knows it's a book and lets you know it's a book to make a point about the artificiality of books, especially books like itself. Or, in the words of Keith Hopper: "The metafictionalist deconstructs the magic of fiction by unveiling the magician's props" (5). This requires odd shifts in plot, narration, and scope to make the reader painfully aware of the writing process, and these shifts create a degree of difficulty and impenetrability reminiscent of Joyce's later works. Like Joyce's work, metafiction also attacks existing value systems. As Hopper explains,

Self-awareness of literary practices is not merely a flashing trick of aleatory sleight-of-hand but an integral part of the wider postmodernist ethos, as it forcibly reminds the reader of the ineluctable writenness of 'reality,' and, on a macrocosmic scale, at the real world is not 'given' but constructed. (9)

If life is, to an extent, written and constructed, then one has a level of control over one's self-conceptualization as an inferior, a superior, or — like Bloom and Mulligan — an observer: one who sits back and bemusedly watches the rat race. If this status is a matter of choice and not caused by a monolithic value system outside the self, then the validity of that value system comes into serious question.
At Swim, Two Birds juxtaposes high and low thought with merry frequency. Its narrator, a bright, lazy student, ponder intellectually his first sip of porter: “The mind may be impaired, I mused, but withal it may be pleasantly impaired. Personal experience appeared to me to be the only satisfactory means to the resolutions of my doubts...LIGHTLY I subjected myself to inward interrogation” (At Swim, Two Birds 28-29). Our precocious young man needs to theorize an excuse for his first drunk. This is more than a little of a parody of Stephen Dedalus. The value system clashes: high theory, low sobriety. To his credit, O’Brien’s narrator at least has a dry sense of humor about it all. And while the narrator spins our view of him with Keatsian references to revelry (“Who are my future cronies, where our mad carousals? What neat repast shall feast us light and choice of Attic taste with wine whence we may rise...What mad pursuit? What pipes and timbrels? What mad ecstasy?” (At Swim, Two Birds 29)) the reality of the situation is that he ends up “leaving a gallon of half-digested porter on the floor of a public-house in Parnell Street” (At Swim, Two Birds 30) and growing a beer belly (At Swim, Two Birds 64).

O’Brien takes on artistic value directly in At Swim, Two Birds. In one scene Shanahan, Lamont, and Furriskey — three contemporary Irishmen — are sitting and conversing with Finn MacCool, a legendary hero of Old Ireland. Finn, as in much of the rest of the novel, drones on tiresomely about the virtues of Finn’s People and begins an epic poem that becomes an Old-Irish grab-bag of images, with choice lines like “good its yewy yew-yews” (At Swim, Two Birds 111), “I flee before skylarks, / it is the tense stern-race, / I overleap the clumps / on the high hil-peaks” (At Swim, Two Birds 111), and “O birch clean and blessed, / O melodious, O proud, / delightful the tangle / of your head roots” (At Swim, Two Birds 100).

Our Dublin everymen are not entertained. Eventually Shanahan interrupts and speaks of another poet, the fictional Jem Casey. Finn drones on, but Shanahan overrides him and recites one of Casey’s poems about, what else: porter. An excerpt:

When food is scarce and your larder bare
And no rashers grease your pan,
When hunger grows as your meals are rare—
A PINT OF PLAIN IS YOUR ONLY MAN.
In time of trouble and lousy strife
You still have got the darlint plan,
You can still turn to a brighter life—
A PINT OF PLAIN IS YOUR ONLY MAN!
(At Swim, Two Birds 108-9)

Casey’s work is straightforward, simple, and will never win a Pulitzer. Yet it is of more value to the modern Dubliner than Finn’s heroic inaccessibility. To the majority of the humans in the room, Casey wins the war of value, turning the system upside-down.

This unsettling of artistic value is a part of a larger cultural unsettling of value in Irish society whereby the Irish began to see themselves less and less as colonized inferiors and more and more as a nation that could challenge British authority. Artists like Joyce and O’Brien, instead of trying to claw their way up the rungs of British culture, simply sidestepped the entire issue by tearing apart the validity of that culture’s judgments in the first place. Joyce and O’Brien both show a literary progression from an elitist, late Victorian/Modernist value system of high and low culture to a subversive, unstructured system where the line between the canon and pulp fiction isn’t as clear as it used to be.
Letters Within Jane Austen's Novels: A Bridge Towards Romantic Communication

BY MARY BUTLER

Jane Austen often incorporates letters within her novels as a method of discreet communication between characters that are prevented from interacting openly with each other because of social convention. *Pride and Prejudice, Persuasion, and Sense and Sensibility* all contain examples of this type of communication in which the character who writes the letter wishes to convey some sort of explanation or emotion that breaks, mends, or rekindles the relationship the writer had with the letter's recipient. Although letters are dispersed throughout her novels, the letters within these three novels play a crucial role in the development of Austen's characters and the advancement of the plot. Through close analysis of the letters, the characters of Mr. Darcy and Elizabeth of *Pride and Prejudice*, Captain Wentworth and Marianne of *Persuasion*, and Marianne and Willoughby of *Sense and Sensibility* are more clearly conveyed than through other literary means such as dialogue or descriptive narration. They provide necessary insight that brings greater understanding to who the characters are, and why each relationship culminates the way it does at the end of the novel.

Certain rules and customs accompanied the tradition of letter writing, especially concerning women. Penelope Joan Fritzter quotes *The Lady's Preceptor*, a common guidebook of propriety in Austen's era, "never...to write to anyone but of your own sex, nor to any but of such Quality and Reputation as that your Correspondence with them may bring no Reflexion on yourself..."(Fritzter 72). Writing to the opposite sex would spark rumors and speculation that the writer and recipient are romantically involved. Fritzter argues that the letters are also used as a way to evaluate the character of the letter writer. The difficulty with letter writing was that letters were not a private exchange of ideas and sentiments as they are today. Instead, the information they carried was frequently shared with the recipient's family and friends. Austen's choosing to bypass this
social custom makes these covert letters so distinctive and influential in her novels.

Austen displays some approval of the rules that The Lady's Preceptor sets forth, namely that letters should not contain anything that may cause shame to the writer later on. The characters that do send letters with imprudent content are caused a significant amount of hurt and embarrassment later on in the novel. Marianne is pitied and whispered about, and Emma ridicules Robert Martin for proposing to Harriet so publicly. Conversely, characters that endeavored to keep their romantic letters private avoided scandal, rumors, and heartache. Public or private, every romantically themed letter that Austen chooses to incorporate into her novels advances the characterization of the writers as well as complicates the plot.

The moment in which Mr. Darcy hands Elizabeth his letter of explanation marks the pivotal turn of events that drastically changes her opinion of him. In order to appreciate the sincerity of the letter, Austen includes a discussion earlier in the novel that illustrates Darcy's method of writing letters. Caroline Bingley compliments his writing, stating that he easily writes such "charmingly long letters" (Pride and Prejudice 53), but her brother Bingley contradicts her and claims that Darcy "does not write with ease" (35) and that he searches for the most precise words to incorporate into his letters. Darcy also argues with Caroline, stating that although his letters may be lengthy, he cannot profess them to be charming. Whether he considers himself to be at ease with his writing is not certain until the text of his letter to Elizabeth is presented. The language Darcy employs in that letter demonstrates how uneasy he is in writing to her. He is continually apologizing for what he feels is necessary for him to explain.

As with his proposal of marriage, Darcy's letter dwells on matters of pride and honor as much as the matters of his heart. There are subtle references to his unrequited feelings, but they are smoothed over with chivalrous bravado and apology. He states that his love for her cannot be forgotten soon enough, and yet repeatedly mentions how strongly he feels for her. The letter demonstrates that although he has given up hope of winning Elizabeth over, his regard for her is just as strong as ever. He compliments her repeatedly, affirming his belief that she possesses enough sense and duty to give credit to his letter and keep its contents a secret. He also describes his feelings for her as "the utmost force of passion" that pushed him to put aside the objections that he held for Bingley to be connected to her family.

Before relating something that could possibly upset Elizabeth, Darcy prefaces the account with an apology. In the beginning of the letter, he says, "if, in the explanation of them which is due to myself, I am under the necessity of relating feelings which may be offensive to yours, I can only say that I am sorry" (151). Several apologies later, he equates offending her with having pain inflicted upon himself, displaying how deep his concern is her feelings. Lastly, he concludes his letter by adding, "God bless you" (156), displaying yet again his enduring affection for Elizabeth and concern for her welfare.

After understanding how important the writing of the letter is to Darcy, it is also necessary to acknowledge the importance of Elizabeth's reading it. Elizabeth prides herself on her ability to read people and the letter forces her to reconsider Darcy's character without the influence of preconceptions she has made of him. Each time she examines its contents, her opinion of both Wickham and Darcy is altered. The first few readings are done with the purpose of finding fault in either Darcy's expression or reasons, but with each passing reading she is inclined to do his arguments more justice.

Elizabeth's prejudice against Darcy is not immediately negated by his explanation. This is partially because of her fluctuating emotions over such an intimate gesture by Darcy and also because "she read, with an eagerness which hardly left her power of comprehension, and from impatience of
knowing what the next sentence might bring, was incapable of attending to the sense of the one before her eyes” (156). This is a continuous problem with her: she assumes what Darcy will say or do before he even takes action. She immediately discredits his opinion of Jane's feelings without considering his perspective as an outsider to the family, rather than an intimate confidante of Jane's. Darcy's honesty about his opinion of her family and connections provokes Elizabeth to be "too angry to have any wish of doing him justice" (156). It is with these thoughts that she moves on the second half of the letter, which details the past Wickham and Darcy have shared. Elizabeth cannot believe that Wickham could be capable of such despicable deceit and manipulation. She is so agitated by the letter that she immediately puts it away, never wanting to look at it again. There are several reasons for her reaction. The initial shock of such a scandal is enough to disconcert her, but coupled with the blow the explanation does to her ego, she is completely thrown. Everything she had led herself to believe about Wickham over the past few months had been exposed as a lie, and she had been foolish in her estimation of Darcy's honor. Not only has she misjudged him to be dishonorable, she has had the audacity to accuse him of it to his face. At first, she is unwilling to believe his explanation, and her former prejudices tempt her to reexamine what he had written.

Within a minute of folding up the letter, Elizabeth takes it out again and attempts to consider its contents with a more objective mind than before. She focused her second reading on everything that related to Wickham, comparing the previous accounts she had received from him to Darcy's explanation of their connection. She was able to allow Mr. Darcy's account to be somewhat truthful because, detail for detail, their stories matched up until the particulars of the late Mr. Darcy's will was brought into the question. Elizabeth believed there to be a "gross duplicity on one side or the other" (157), and at first is unable to discern who the liar could be.

Her partiality for Wickham leads her to wish for his innocence, but she realizes that she must give some credit to Darcy's testimony because he referred her to Colonel Fitzwilliam, while Wickham had no one to verify his story. Elizabeth realizes that before meeting him on the street, she had never heard any recommendation of his character or account of his past before entering the Militia. Elizabeth is mortified because she had taken his easy manner and mild humor as an indication of excellent character. She chides herself, "...pleased with the preference of one, and offended by the neglect of the other, on the very beginning of our acquaintance, I have courted prepossession and ignorance, and driven reason away, where either were concerned"(159). Elizabeth is willing to give Darcy's story credence because she has now seen how imprudent her actions and judgments have been. Darcy's testimony is further validated in Elizabeth's mind because she holds Fitzwilliam in the highest regard and knows that Darcy would not have supplied him as a reference if his story had not been truthful.

After reconsidering how imprudent her estimation of Wickham's character had been, Elizabeth allows herself to review her opinion of Darcy's as well. An unexpected meeting at his home in Derbyshire gives her a glimpse of the real Mr. Darcy; a man of honor, character and respect. Towards the end of the novel, after Darcy has renewed his proposal and Elizabeth has accepted, she admits that it was his letter that first influenced the improvement of her feelings towards him. Without such a private communication on his part, she would have continued to judge him to be a man of ill character and never would have developed the strong inclination and respect she felt for him at the end of the novel.

Although Captain Wentworth of Persuasion composes his letter under different circumstances, its delivery is also concealed. He is prompted to write his declaration of love from the conversation he overhears Anne Elliot having with Captain Harville about the inconstancy of male emotion, specifically love. She believes that although men may from
strong attachments, they are not capable of maintaining them for long periods of time. She argues "we do not forget you, so soon as you forget us" (Persuasion 222) and as she says this, Wentworth drops his pen because he has been straining unconsciously to hear her conversation. Anne's words were spoken to Captain Harville, but their meaning was meant for Wentworth alone. Her claim that a woman's love spans both time and distance encourages him to hope that her own love is as unaltered as his own, and he expresses his hope in the form of a love letter.

Wentworth's letter is, by far, the pinnacle of all love letters. His honesty, depth of feeling, and articulation of so overwhelming an attachment to Anne is unequaled in any other Austen novel. Wentworth tells her that she pierces his soul, and their undecided fate has put him into agony. Once again, as with Darcy's letter, the writer is refuting a claim that the female recipient has made against him "by such means as are within [his] reach" (227). Anne and Wentworth have spent the entire novel putting up a front that they have never been anything other than indifferent acquaintances; therefore, to attempt an intimate meeting to discuss their misunderstanding would cause an incredible scandal.

Austen had not originally planned to incorporate such an explicit declaration of love. In Persuasion's original ending, Wentworth was commissioned to write a letter officially announcing the rumored engagement of Anne and Mr. William Elliot, and Anne confides in him that she never had intended to marry Mr. Elliot. The published ending for the couple is much more feasible, because the likelihood of the two lovers being allowed to stay within the same room alone for such a long period of time is very small. Also, the letter offers Wentworth a chance to apologize and explain his recent vindictive behavior with Louisa Musgrove, whereas the original ending lacks any explanation of his actions. This redemption of his character is extremely important, because the reader's estimation of Wentworth thus far in the novel has been based solely upon his actions and treatment towards Anne. In order for the reader to understand why she has such a strong, lasting regard for him, it is necessary for Austen to display his genuinely good character as well as his own enduring affection for her that makes him worthy of such a woman as Anne Elliot.

Although some of the letters Austen creates are a secret, letter writing was primarily a public art form that was often judged by more people than just a letter's recipient. In the case of Sense and Sensibility and Emma, the public nature of the letters ends up damaging the relationship of the two lovers involved. In the case of Harriet and Mr. Martin, the letter is shared with the wrong person and the budding affection Harriet feels towards him is squashed by Emma's selfishness and sense of pride in her ability as a matchmaker. Conversely, Frank Churchill and Jane Fairfax's private correspondence allows the two lovebirds to maintain a relationship without the criticism of other members of their society.

Had Harriet had kept Mr. Martin's proposal to herself and not shown the letter to Emma, she might have found happiness with him much earlier in the novel, and avoided both her heartache over Mr. Elton and Mr. Knightley. When Harriet first shares the letter with Emma, it is Emma's intention to merely hint at her disapproval of such a match, and "for a little while Emma persevered in her silence; but beginning to apprehend the bewitching flattery of that letter might be too powerful, she thought it best to say" (Emma 47) that she felt it would be the right decision for Harriet to refuse Mr. Martin. If the letter had been kept out of Emma's reach, she would have never been able to exert her power of manipulation over Harriet.

The beginning of Sense and Sensibility characterizes both Marianne and Willoughby as two people whose actions are completely driven by their emotions. Friends and family believe that despite their impulsive natures, they had been sensible enough to at least form an engagement that they preferred to keep secret. Given that both Marianne and Willoughby prefer all things dramatic, it would be understand-
able to think that two young lovers who cite the Romantic poet William Cowper among their favorite literary artists may want to keep their engagement under wraps to make it more exciting. Another way of making their relationship more exciting is by breaking social convention in order to communicate with one another via letters.

Not only are Marianne and Willoughby breaking social convention by writing to one another, they are doing it publicly. The public exchange of letters serves to accent the two characters' impetuosity, especially Marianne's. Austen employs this technique several times in the novel, focusing on making the writing of the letters develop her character in more vivid detail. Austen does not stop her characterization of Marianne with just the sending of the letters. She also provides the reader with the full text of what Marianne has said to Willoughby. Exposing Marianne's thoughts and feelings in such a manner serves to explain exactly how deep the relationship between she and Willoughby ran. Without providing the text of the letters, the reader would be left to speculate how deeply Marianne loved Willoughby, and how hurt she was by his cold actions at their meeting.

Her letters are unguarded and filled with emotional sentiment and esteem for Willoughby. In fact, her last letter is written while fighting off a fit of tears, demanding an explanation for his coldness to her when they were reacquainted after a long separation. She writes as fast as her pen will allow her, without taking the time to think about what might be proper to say on such an awkward occasion. There is such confidence in her words that leaves no room for doubt of his unchanged affection for her.

Marianne's repeated correspondence with Willoughby causes more harm than good. Choosing to defy the social customs that prevented single, unengaged men and women from writing to the opposite sex opens Marianne and Willoughby to public censure. Willoughby is deemed a rake for leading Marianne on and fueling an attachment that he had no intention of fulfilling. Marianne becomes the pitied public figure who has acted too rashly and trusted too deeply. If the letters between the two lovers had been sent without public knowledge, both would have avoided some of the gossip that springs from their actions.

Through Marianne's final letter, Austen is trying to show both the strength of Marianne's attachment, as well as the imprudence of it. Such a communication is extremely ill-advised, because it leaves Marianne open to censure and ridicule for anyone who is allowed to read the letter. Consequently, when the last person who should lay eyes upon it, Miss Grey, gets hold of it, more pain and suffering than is necessary occurs. Marianne's openness sparks such a wave of jealousy and possessiveness in Miss Grey that she directs Willoughby to respond back in such a cold, heartless way that is completely uncharacteristic of him.

The content of Willoughby's response to Marianne is not romantic, but rather a rejection of her attachment towards him. When she shares the letter with her sister, Elinor is shocked that such a letter could have come from Willoughby's own hand. Knowing him to be of the same disposition as her sensitive sister, she finds it hard to believe that not only does he make no apology for his actions, but hazards the assumption that his affection for Marianne was imagined on her part. His indifference, in Elinor's eyes, "proclaimed him to be deep in hardened villainy" (Sense and Sensibility 137) and void of gentlemanly character.

Willoughby's response is equally, if not more important than Marianne's tearful letter. His letter is like a bucket of cold water dumped over the fiery, ardent love that Marianne harbors for him. Also, it eradicates any lingering hope the reader may entertain for him to be Marianne's knight in shining armor at the end of the novel. All respect and faith in his good character is gone and once the reader and Elinor are shown the heartless letter that he has sent rejecting Marianne. His character is damaged to the point that the reader does not want Marianne to end up with someone who is capable of causing her so much pain.
Austen does not keep her readers mystified by Willoughby's actions for the entire novel, but rather includes a scene between him and Elinor in which he explains why the letter had been written in such a cold manner. All the circumstances leading up to the letter's composition are accounted for, and Elinor comes to understand that Willoughby had been a scribe subject to his future wife's commands. He states, "I had only the credit of servilely copying such sentences as I was ashamed to put my name to" (249). This meeting between protective sister and former lover ties up the loose ends that the letter itself leaves behind.

Although Willoughby's actions are better understood after this meeting, it is his letter that reminds the reader why Marianne and Willoughby do not reunite at the end of the novel. The letter hurts Marianne to the point that she cannot allow herself to become attached to anyone that holds a risk of hurting her so deeply again. Analysis of Willoughby's actions and letter, when compared with the observation of the kindness Colonel Brandon has unconditionally bestowed upon the entire Dashwood family, explains why Colonel Brandon and Marianne decide to marry each other. Both harbor past scars that have reigned in their sensibilities, and Marianne knows that there is little risk that the Colonel could hurt her as Willoughby once did.

In *Pride and Prejudice, Persuasion, and Sense and Sensibility*, letters serve as both a mode of explanation by the writer and a method of connection by Jane Austen. Although social customs made communication extremely difficult and guarded, these letters and subsequent discussions sparked, offer the reader a glimpse beyond civility and propriety and into the characters' minds and hearts. Both Mr. Darcy's and Captain Wentworth's letters justify their actions to their female recipients, whereas Willoughby's causes more confusion and hurt. Each letter's intention and content provide in-depth character insight for the reader and work to advance or resolve the plot in ways other literary means could not. Close examination of the letters provides the reader with a greater understanding of the characters who wrote them, the characters who read them, their intended purpose, and their importance to the composition of the novels.

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**Works Cited**


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Corie wrote this piece as part of her Honors thesis under the mentorship of Dr. Ann Brunjes. She plans on pursuing a career in the fine arts field, while also continuing to produce her own artwork.

Author James Fenimore Cooper and painter Thomas Cole both observed man's progress west and both disapproved of the way in which the settlers went about this expansion. They were not against such progress, but both men disagreed with the harmful way it was done, with the natural environment suffering irreversible harm. Had the pioneers gone about making their changes in a different way, Cooper and Cole seem to suggest, the new society could have been established without corrupting the environment and would not have been criticized by these artists; however, the settlers showed little or no regard for the natural state of this new land. As a result, Cooper and Cole found reason to voice their displeasure and disapproval, doing so through their art.

In the first of the Leatherstocking series, *The Pioneers*, Cooper makes his strongest arguments against man's wasteful ways and first introduces the audience to woodsman Natty Bumppo. The fictional town of Templeton had its roots in the real town that Cooper's father had founded: Cooperstown. Cooper grew up watching the changes that man inflicted on the landscape and his conflicted attitude towards the "progress" that those settlers made are expressed throughout *The Pioneers*. During the time that Cooper wrote the Pioneers, there was much concern in the Otsego area about the environment, as the area grew more and more crowded and as the ground was depleted of nutrients from all of the farming being done (Taylor 387). This depletion caused a great financial burden in Cooperstown, with Cooper and his family taking a severe financial blow as a result (Taylor 390). Cooper called this time in the process of settlement the "second stage" where "we see the struggles for place, the heart-burnings and jealousies of contending families, and the influence of mere money" (Taylor 426). A large part of these jealous contentions were over the land, as the settlers fought to claim and tame the natural landscape,
and as the people then overworked that land in their thirst for wealth. These concerns all went into the writing of The Pioneers, where Cooper depicts the state of New York as he saw it growing up.

Cooper begins the novel with a very positive description of the frontier and its settlers, describing Otsego county as "one of the most populous districts of New York. It sends forth its emigrants like any other old region, and it is pregnant with industry and enterprise. Its manufactures are prosperous" (The Pioneers 8). Cooper begins with a fairly positive image of the land and its settlers. However, this glowing review of such newfound industry must be reconciled to the open critique of the destructive ways of the settlers throughout the novel, showing Cooper's unresolved tension about the white man's progress west. This tension is never resolved through any of the Leatherstocking Novels, as he expresses both the necessity of expansion and a concern for the effects that this expansion had on the natural state of the land.

The attitude of many of those settlers in Templeton toward their surroundings can be summed up in the words of the local sheriff, Jones, who remarks to his cousin Elizabeth, "We must run out streets by the compass, coz, and disregard trees, hills, ponds, stumps, or, in fact, any thing but posterity" (183). Streets were a necessity, but it was this attitude of total disregard for the natural state of the land that disturbed Cooper, as trees were felled and ponds polluted with no thoughts as to the future. Man stormed the countryside; there was no middle ground, no compromise with the natural state, but a complete takeover. It was not the expansion that was the problem in Cooper's mind, but the way it was accomplished.

This wrong attitude towards the westward expansion is also addressed by Judge Temple, who is largely responsible for many of the changes being made. Temple, like Cooper, approves of growth of the civilization, but sees serious problems in the actions of the settlers. Temple addresses this wrong attitude on the part of the townspeople, saying, "It grieves me to witness the extravagance that pervades this country...where the settlers trifle with the blessings they might enjoy, with the prodigality of successful adventurers" (228). The settlers, rather than appreciating this new country's bounty, act extravagantly, heedlessly harvesting all of what the land has to offer with the attitude of "successful adventurers," rather than respectful new inhabitants of an untamed land.

Throughout the novel, Cooper cites many examples of what were simply inexcusable examples of wastefulness and destruction of the environment. During a Christmas shooting match, we are introduced to the character Billy Kirby, an obnoxious and arrogant logger. Kirby becomes the wrongdoer in several extended examples of wastefulness, opposed by both Natty and Judge Temple. At one point, several of the characters, including Natty, Temple, and Temple's daughter Elizabeth, go to watch the destructive Kirby in one of his many enterprises: making sugar. Billy makes use of an "extremely wasteful and artificial arrangement" that Temple openly criticizes, saying "You make dreadful wounds in these trees, where a small incision would effect the same object. I earnestly beg you will remember, that they are the growth of centuries, and when once gone, none living will see their loss remedied." Kirby responds ignorantly that he does not see the need for so many trees anyway, saying, "Now, I call no country much improved, that is pretty well covered with trees. Stumps are a different thing, for they don't shade the land; and besides, if you dig them, they make a fence that will turn anything bigger than a hog, being grand for breachy cattle" (228-229). Kirby only sees the value of trees in terms of the money he can make from either chopping them down or gouging unnecessary holes in them, and the other characters see that there is no reasoning with him. The chapter ends with Billy singing a logging song about the "proud forest falling." It concludes with the verse, "Choose the oak that grows on the high land, or the silvery pine on the dry land, It matters but little to me" (The Pioneers 230).
As Natty comments, the settlers “alter the country so much, one hardly knows the lakes and streams” (206). Cooper also describes a mass shooting of pigeons, of which Temple disapproves. This is another example of what Natty calls the “wasty ways” of the pioneers. Soon after the pigeon shooting, a fishing expedition is made by Richard, Benjamin, and Kirby among others, with Temple and the two girls along to watch. This is another extensive example of the wastefulness indulged in by these men, as they haul in far more fish than they can eat. The young ladies watch from the shore with Temple, as the bulging nets are dragged in several times, resulting in a vast heap of fish on the sand. Temple comments to his daughter, “This is a fearful expenditure of the choicest gifts of Providence. These fish, which...will be rejected food on the meanest table in Templeton, are of a quality and flavor that, in other countries, would make them esteemed a luxury” (259). What they have is not appreciated by the settlers, but wasted. Food that would be seen as a luxury in other lands is not valued and respected, but hauled up on the beach to rot. Temple’s words go unheeded as the fishermen go out for another run.

This fishing expedition is contrasted against the actions of characters more appreciative of the land’s bounty. Natty makes a similar statement to Temple, but does it through his actions, as he sails over the lake in his own manner of fishing, accompanied by Oliver and John. Natty’s way of fishing is beautiful, and Cooper adopts an almost sacred tone when describing it, as the men slip quietly over the water in their tiny boat. Elizabeth goes along with them to see how these men fish, and it seemed to her “that they glided over the water by magic, so easy and graceful was the manner in which Mohegan guided his little bark” (268). Rather than catching every fish they see, these men treat the fishing trip as a kind of journey through nature, taking a step back to observe all that is available to them: “Elizabeth saw thousands of these fish, swimming in shoals along the shallow and warm waters of the shore; for the flaring light of their torch laid bare the mysteries of the lake, as plainly as if the limpid sheet of the Otsego was but another atmosphere” (268). Natty spears just one large fish with a single blow, not wishing to take more than he needs as they glide over this other “atmosphere” that is the lake. Unfortunately, the peace presiding over the group is broken as the other fishing party again comes into view, and Natty, Elizabeth, John, and Oliver are bombarded by “the hoarse sounds of Benjamin's voice, and the dashing of oars, as the heavier boat of the seine-drawers approached the spot where the canoe lay, dragging after it the folds of the net” (270).

Kirby may be a completely thoughtless and wasteful character for much of the novel, and Temple does act as a voice of reason in combating his ridiculous attitude towards the environment. However, Temple, as founder of the town, bears a great responsibility for the changes being made. He may openly criticize the wasteful practices he sees, but takes no action himself. He is content to wait for future laws, ones that have already been called into question by other characters. Natty questions the effectiveness of such laws, saying, “You may make your laws, Judge; he cried, 'but who will you find to watch the mountains through the long summer days, or the lakes at night?’” (160). As Temple watches in distress, the trees are felled and the animals are killed needlessly. Temple may speak out, as Cooper does through his writing, but nothing in Templeton changes as a result.

Cooper does not limit himself to these straightforward, inarguably wrong methods on the part of the pioneers; he also gives several examples which are not set down in black and white. In several portions of the book, it becomes apparent that Cooper himself cannot come to terms with what the setters are doing, but at the same time cannot be wholly against westward progress. Soon after seeing Kirby’s wasteful ways in making sugar, Temple, Richard, Elizabeth, and Louisa all go on a sight-seeing trip on horseback. The conversation centers around how much the land has
been "improved" by the settlers, with Temple leading the conversation. Temple has been a voice for conservation of the land, but he also speaks approvingly of the improvements that have been made, including clearing away underbrush and forming better roads. He tells his daughter that the earliest settlers in that area were miserable, and that man's changes were what made living there possible:

If thou hadst seen this district of country, as I did, when it lay in the sleep of nature, and had witnessed its rapid changes, as it awoke to supply the wants of man, thou wouldst curb thy impatience for a little time...no more than five years have elapsed, since the tenants of these woods were compelled to eat the scanty fruits of the forest to sustain life, and, with their unpracticed skill, to hunt the beasts as food for their starving families. (232-233)

The improvements made by those earlier settlers were necessary and justified; the animals were needed to provide food, and trees had to be cut down to build shelter.

However, due to man's greed, the situation only grew worse, as Temple tells the others: "It was a season of scarcity; the necessities of life commanded a high price in Europe, and were greedily sought after by the speculators. The emigrants, from the east to the west, invariably passed along the valley of the Mohawk, and swept away the means of subsistence, like a swarm of locusts" (234). It was not the land that caused the real devastation to the settlers; it was the greed of man. Speculators and emigrants alike were responsible for the early settlers' financial hardships, and they chose to sweep away the "means of subsistence like a swarm of locusts." Eventually, these hardships were dealt with by relying on what the land had to offer:

Something like a miracle was wrought in our favour, for enormous shoals of herrings were discovered to have wandered five hundred miles, through the windings of the impetuous Susquehanna, and the lake was alive with their numbers. These were at length caught, and dealt out to the people, with proper portions of salt; and from that moment, we again began to prosper (234-235)

This fishing expedition was not the fishing of Richard, Benjamin, and Kirby. The fish were seen, not as something to be cast aside and wasted, but as a miracle, a life-saving miracle that was evenly distributed and used by grateful settlers. Man's greed had devastated those early settlers, but their problem was resolved through a proper use of natural resources. Such use of the natural resources was necessary, but there is a fine line between harvesting resources out of want, and harvesting them out of greed, and it was in that gray area that Cooper's discomfort existed. In the case of both fishing expeditions, massive amounts of fish were caught, but there is a tension between what is the proper use of the fish, and by extension all of the land, and what is not. There has undoubtedly been an improvement, but there has also been destruction and waste.

This tension is also shown as the author paints a picture of the land trying to renew itself. He reflects on the changing seasons, and what changes result in the plant growth:

The heats of the days, and the frequent occurrence of balmy showers, had completed, in an incredibly short period, the growth of plants, which the lingering spring had so long retarded in the germ; and the woods presented every shade of green that the American forests know. The stumps in the cleared fields were already hid beneath the wheat, that was waving with every breath of the summer air, shining, and changing its hues, like velvet. (283)

Cooper shows the power of nature in the rebirth that is spring, as "the woods presented every shade of green that the American forests know." But Cooper does not just dwell on
the new growth; he also shows us the presence of man, which is evident from the "stumps in the cleared field...already hid beneath the wheat." In this short period of time, the land was trying to renew itself, but the wheat could only cover the stumps; the land could only cover over the damage that man had caused. Planting crops is necessary, but Cooper reminds his reader that something is lost in the process.

Elizabeth’s journey to an area called The Vision to meet with Natty best exemplifies this tension between natural land and forward movement. This area, like many of the places described in The Pioneers was modeled on a real area in Cooperstown, also known as The Vision (Taylor). This area is renowned for its beauty and incredible views of the surroundings lands; interestingly, this area has also been improved by man:

On the summit of the mountain which Judge Temple had named the Vision, a little spot had been cleared, in order that a better view might be obtained of the village and the valley. At this point Elizabeth understood the hunter she was to meet him; and thither she urged her way, as expeditiously as the difficulty of the ascent and the impediments of a forest in a state of nature would admit. Numberless were the fragments of rocks, trunks of fallen trees, and branches, with which she had to contend; but every difficulty vanished before her resolution, and, by her own watch, she stood on the desired spot several minutes before the appointed hour (398-399).

The Vision is a beautiful spot, and the improvements that man has made improve the view; in this way, man’s improvements have aimed towards a greater appreciation of the landscape. But at the same time, this improved view comes with a cost. The “numberless” bits of fallen trees and branches left behind on the ground contribute greatly to the forest fire that soon follows, caused by the settlers’ mining into the side of the mountain. As a result of man’s greed and their carelessness in taking down the trees and shrubs, the mountainside is destroyed, and Indian John dies in the fire. Cooper may have appreciated the view of The Vision himself while growing up in Cooperstown, but he juxtaposes man’s improvements against the devastation that results from their greed.

Cooper presented his views on the destruction of the natural environment in other novels of the Leatherstocking Series, including The Prairie, published in 1827. In The Prairie, the familiar character of Natty Bumppo is known only as The Trapper, transformed from the mighty hunter into a kind of sage, permanently imbedded in the landscape, apart from the ways of the white man. The Trapper also becomes a voice for Cooper’s environmental concerns. The prairie here is not an authentic representation of the American prairie in Cooper’s day. Cooper paints a picture of what he saw in the future: a vast, inhospitable wasteland, the result of man’s destructive ways.

At the beginning of this novel, the Trapper meets the Bush family, who wish to settle down in more uninhabited parts of the west. Upon finding a spot to camp, the family must procure some kind of firewood, so “the eldest of the sons stepped heavily forward, and, without any apparent effort, he buried his axe to the eye in the soft body of a cotton-wood tree.” However, the damage does not end with just one tree:

They advanced in a body to the work, and in a space of time, and with a neatness of execution that would have astonished an ignorant spectator, they stripped a small but suitable spot of its burthen of forest, as effectually, and almost as promptly, as if a whirlwind had passed along the place. The stranger had been a silent, but attentive observer of their progress. As tree after tree came whistling down, he cast his eyes upward, at the vacancies they left in the heavens, with a melancholy gaze, and finally turned.
away, muttering to himself with a bitter smile, like one who disdained giving a more audible utterance to his discontent (18).

They have no regard for the environment, and the Trapper can do nothing but stand by and watch as these people, like a whirlwind, ravage an area where peace and quiet had ruled only hours before. *The Prairie* is the last of the Leatherstocking Series, and it does not present a positive view of the future of the environment.

Cooper's environmental statements also serve as a warning for the settlers. In his article "James Fenimore Cooper: Pioneer of the Environmental Movement," Hugh C. MacDougall of the James Fenimore Cooper Society discusses Cooper's interest in providing a warning for his fellow settlers. In *The Prairie*, "Cooper uses the idea of the prairies to forecast the future of the America whose wasty frontier customs he had described, and deplored, in *The Pioneers*" (MacDougall 6). Cooper attempted to show his fellow Americans that "our natural resources are not inexhaustible; that natural beauty, wilderness, and wild creatures and plants must be preserved; and that failure to heed nature's warnings may spell our own destruction" (MacDougall 7).

Like Cooper, Thomas Cole expressed similar misgivings about the environment, both in his paintings and in his poetry. In Cole's series masterpiece, *The Course of Empire*, the artist worked to show the devastating effects of man's actions of nature. This series focuses on the same piece of land, seen from different viewpoints in different stages of civilization. A distant cliff serves as a common focal point in each painting around which the changing landscapes revolve. The first of the series, from 1836, "The Savage State", presents the viewer with a group of hunters chasing down a herd of deer.

"The Course of Empire: The Savage State"

The animal kingdom has succumbed by the next painting, "The Pastoral or Arcadian State" from 1834. Here there is a portion of natural landscape left, with the mountains remaining undisturbed in the background, and a forest coming down uninhibited to meet the edge of a pond in the middle ground. However, as the empire moves through its stages, the landscape is virtually obliterated, only to be replaced by columns, statues, and fountains in addition to endless buildings in "The Consummation of Empire." Here, even the revolving point of the cliff is being taken over; in place of unbroken vegetation, roadways and buildings now zigzag their way up the side of the mountain.

The fourth painting, "Destruction", shows what Cole saw as the inevitable fate of any empire bent on such total control: violence, fire, destruction of property, and loss of life. As Cole remarked on the painting, "Luxury has weakened and debased. A savage enemy has entered the city. A fierce tempest is raging" (Wilton and Barringer 105). In the final painting, entitled "Desolation", man has departed,
leaving only the ruins of empire behind him. However, this painting does present hope and new life to the viewer. It is done in somber tones of dark greens and grays, punctuated by sickly shades of yellow and off-white, but patches of lively green can be seen in some areas where the trees are growing back. As Wilton and Barringer point out, “Human life has vanished, but nature is reclaiming the landscape... The cycle that opened with hunters pursuing deer in the Savage State has reversed itself, and the animals can now graze without fear of predators” (108). The vegetation, along with the appearance of deer, herons, and a stag all show the reemergence of nature, of the world undisturbed that Cole pictured existing before being taken over by man.

“The Course of Empire: Desolation”
This changing world portrayed in the Course of Empire has much in common with Cooper’s changing world of Templeton. In both worlds, we see the animals being chased out, as the new inhabitants take hold of the land. As Elizabeth observes in The Pioneers, “How rapidly is civilization treading on the footsteps of nature!” (212). Just as greed takes over the settlers in The Pioneers, prompting them to waste hundreds of fish in sport, greed takes over in Cole’s painted society, with ornate buildings completely overtaking the landscape. The result of this is a weakness that is tested by the enemy invader; the civilization is destroyed. It becomes a desolate wasteland, much like the one predicted by Cooper in The Prairie. Cooper depicts a mass devastation of trees in word, as the Bush family strips away an entire section of forest and the Trapper looks on with a bitter smile. Cole depicts the same situation in paint, as man completely removes all vestiges of a fertile environment, replacing the trees and animals with doomed pillars and columns.

In 1839, Cole painted “A View of the Mountain Pass Called the Notch of the White Mountains (Crawford Notch).” It is an autumn scene, with a mountain looming in the background. The foreground consists of a small clearing bordered on each side by thickly wooded areas; the greens of the woods are occasionally pierced by a patch of yellow or orange, and a gleam of sunlight illuminates a small, clear pond. But the light also illuminates the focal point of the painting: a man-made clearing with an expanse of stumps where trees once thrived, complete with both a small house and desolate shack, one on either side of the entrance to the notch. The few trees remaining in the clearing are mere skeletons, with twisted trunks naked of their leaves and only stumps remaining where their boughs have been lopped off. There is but one lone rider in the center of the clearing, apparently making his way towards the house. The man is dwarfed by the enormity of the mountain behind him, but at the same time, it is clear that this small figure is a force to be reckoned with; in this area alone, he has stripped away much of what existed naturally. It seems inevitable that the wooded areas both to the right and to the left of this clearing will also be stump fields in a short matter of time.
"A View of the Mountain Pass Called the Notch of the White Mountains"

As in Cooper's work, Cole's paintings show an unresolved tension between the progress of man and the conservation of nature. To build the empire, it is necessary for man to chop down the trees and pursue the animals. Yet the final outcome of this course of empire shows a clear warning, showing a bleak future where the natural forces of nature will once again come to reside where man has failed to prosper. In "Crawford Notch," the home that exists in the painting is required by the lone figure, and the wood that has been chopped down needed both to build with and to burn for heat. Nevertheless, these paintings leave the viewer with a sense of desolation, as they see the progress of man destroying the untouched beauty of the wilderness.

Cole mourned the passing of the natural environment in his poetry as well as his painting. In his 1825 poem "Vision of Life" he expresses his anxiety over the loss of the land due to the progress of industrialization, a land that he saw as an earthly paradise (American Painting, 40). In this poem, Cole is visited by a spirit who tells him to look "Below-before-behind." The poet's eye is met with what man has done to the earth, the remains of an idealized paradise: "But left unfinished/and nought but weeds/And plants pale in the poisoned sickliness/Could vegetate in that accursed soil." All the poet could see were "bare rocks and rugged hills" sparsely covered by the sickly plants, all that would grow in the poisoned soil. When told to look to the past, the poet sees a different scene, a "veil of tender beauty," but can find no comfort from it:

And the drear, desolate wild, that we had passed-
Retiring grew more lovely ere 'twas lost-
"Is this my destined lot," I sighing said, "thou spirit
Ne're to find joy, but in the fading past?
Bliss sicklied with regret

Cole can find no comfort in this past beauty, as it is gone and he does not seem to think that it will occur again. The spirit's answer reconfirms the fact that Cole himself had no answer:

- The spirit spoke again
  But faint and brokenly: and much escaped
  My lingering ear- "another state of being"
  "Eternity" - "good, evil" - "woe and bliss"
  Were all I gathered more

The painter, like Cooper, was deeply concerned over what he saw happening to the American landscape. However, he is grasping at a paradise that only exists in his mind, an idealized version of the land that will never exist again, except perhaps in "another state of being." Whether this land is described by Cooper, like Lake Otsego, as a different atmosphere, or by Cole as another state of being, it is a doomed land, one that by nature must change. With the coming of a new civilization, the ideal natural landscape is swept away, and all that is left is the image left in the artist's mind.
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Charles Franks Address Election to the American Garden in 1801
by L. D. C. F. F. B.}

W
Charles Francis Adams, Great Britain, and the American Question in 1861

by Ian Delahanty

Abstract

While the South seceded from the Union throughout the winter and spring of 1861, Americans prepared for what would become the country’s costliest war in terms of human sacrifice. Ordinary men became citizen-soldiers in the blink of an eye, and Americans North and South rallied behind their respective causes for what many expected to be a brief conflict that would determine the fate of America. Of course the war was nowhere near as brief as many expected and eventually took the lives of hundreds of thousands of Americans. The Civil War, however, did determine the fate of America; the conflict in many ways has shaped the United States as we know it today and its consequences may be seen throughout the nation. However, the fate of America was not decided solely on its battlefields.

The world’s greatest power of the mid-19th century, Great Britain, watched America with an anxious eye in 1861. Americans at home and abroad were well aware that should the British government side with the Confederacy, there was a very real possibility that the Union could do nothing to prevent the separation of the United States. With this in mind, the State Department serving under the Lincoln administration immediately set out to ensure that Great Britain, should it not see fit to side directly with the Union, remain a non-factor in the conflict. Secretary of State William Seward firmly believed that if the British government could be kept from interfering in America’s Civil War, the Union would crush the Confederacy in a mere matter of time.

Thrust into this diplomatic struggle was the newly appointed American minister to Great Britain, Charles Francis Adams. Adams’s mission in Great Britain was one of the most vital roles played by any member of the Union government during the Civil War. The year 1861 was a particularly essential period with
regard to Anglo-American relations and British non-intervention in the conflict. A series of trans-Atlantic feuds beset the Union and British governments, threatening to not only bring Great Britain closer towards recognizing the Confederacy but also nearly bringing about a third conflict between America and Great Britain. Fortunately for the Union, Adams proved an adept diplomat and did a great deal to preserve relations between the two countries as well as prevent the British government from intervening in America's domestic difficulties.

The following are selected excerpts from the author's thesis, "Charles Francis Adams, Great Britain, and the 'American Question' in 1861." A brief background to Adams's role is provided along with a concise summary of the issues that divided America and Great Britain throughout 1861. The majority of the article details the final incident of the year, the Trent Affair, and demonstrates how Adams was able to aid in preserving peaceful relations between the Union and British governments. Finally, the conclusion offers a brief recap of the entire thesis as well as a final word regarding Adams's critical role as American minister to Great Britain in 1861.

Adams, who had been elected to the thirty-sixth United States Congress as a member of the House of Representatives in 1859, heard many rumors in the immediate wake of the 1860 presidential election that he might be selected as a cabinet member. When Lincoln selected Adams's friend and political ally Seward as secretary of state, Seward promised the Bostonian to do all he could to get Adams into the cabinet as well, possibly in the Treasury. When such an appointment did not materialize for Adams, Seward immediately pressed Lincoln to give Adams the mission to Great Britain. The newly appointed secretary realized that New England was an "important point" for Lincoln to consider when handing out appointments, and since Adams had not been included in the cabinet, the appointment as America's foremost minister abroad seemed fitting. Lincoln had intended to send William L. Dayton to the Court of St. James in London to serve as America's Minister to Great Britain. However, having been convinced by Seward that Adams was best suited for the duties and functions of America's representative in London, Lincoln nominated Adams for the office on May 18. Adams was quickly confirmed by the Senate and received the news of his selection on May 19. The news of his father's selection "fell on our breakfast-table like a veritable bomb-shell, scattering confusion and dismay" wrote Adams's son, Charles Francis Jr. in his diary.

Adams took his nomination to be a sure sign of Secretary of State Seward having a growing influence over the President's decisions, something Adams saw to be a "favorable sign." Adams was a strong admirer of Seward and, as his son Charles Francis Jr. later wrote, believed that Seward was "at his best- truly a statesman" during the secession crisis of late 1860 and early 1861. Thus it is not surprising to find that, much the same as Seward, Adams believed that the South's actions were merely bluster and idle threats. During the winter of secession, both men steadfastly held to the notion that a dormant Unionist sentiment existed within the South. This so far silent bloc would allow a compromise to be reached whereby the South would rejoin the Union, slavery would be maintained where it was currently in place, and any sort of conflict would be averted. Seward, along with Postmaster General Francis P. Blair, had even argued against the reinforcement of Fort Sumter because he did not want to bring about a crisis that he believed could still be avoided. Adams wholeheartedly agreed with Seward's approach to the Sumter crisis, and when the attempted reinforcement of Sumter resulted in the first shots of the Civil War, the Bostonian was furious with Lincoln for not heeding Seward's counsel.

Of course, Adams and Seward grossly overestimated the amount of Unionist sentiment in the South. The two also severely underestimated the extent to which Southerners were
prepared to fight for their independence during the secession crisis of 1861. However, as Adams prepared to depart for London during late March and early April, his trust in Seward’s ability as a statesman was unshaken and would remain so throughout Steward’s tenure as secretary of state. This trust in Seward, though put to the test often in the year 1861, was vital to his task in Great Britain. While Adams sometimes questioned and even altered Seward’s tone or use of language in the secretary’s instructions to the London legation, Adams was careful to always convey the actual intent and overall message of them to Lord John Russell. In many ways, the intense admiration that Adams displayed for Seward while in London, coupled with the respect earned by Adams himself within Palmerston’s government, served to create a grudging amicability in the relationship between the foreign offices of America and Great Britain during the Civil War.

As the Lincoln Administration came into office in early March, 1861, it was faced with myriad challenges, not the least of which was essentially creating a new government from outgoing President James Buchanan’s bureaucracy. This meant that Lincoln and Seward had to select and have confirmed by the Senate their selections for foreign ministers. It also meant that the incoming administration was forced to leave in place the outgoing ministers until their replacements had arrived, as was the case in Great Britain. In a number of cases these ministers were by no means loyal to the newly elected president and several had gone so far as to openly support the Confederacy while still stationed in their respective nations. Needless to say, Secretary of State Seward must have desired to have his new ministers situated in their new missions as soon as possible...

Adams did not set foot in England until May 13, however, and in the meantime the British government issued a declaration, the Queen’s Proclamation of Neutrality, that recognized both North and South as belligerents in a state of civil war. Although the Palmerston ministry claimed to issue the Proclamation as purely a domestic measure, many within the Union government (especially Seward) saw it as a hostile act that would pave the way for full-fledged recognition of the Confederacy. More importantly, the Proclamation was only the first incident in a series of quarrels between the British and Union governments throughout the spring, summer, and autumn of 1861. Negotiations relating to neutral maritime rights created an atmosphere of mistrust between Washington and London in May and June. Great Britain’s need for cotton caused the Palmerston ministry to complain bitterly against the Union blockade and threatened to destroy relations between the two countries when rumors reached England of the possibility that the Union would close Southern ports by decree in July and August. The results of the Battle of Bull Run in late July led many in the British government to seriously question the Union’s ability to conquer the South militarily. Backdoor negotiations between a British consul stationed in Charleston, South Carolina and representatives of the Confederate government were exposed to the Union government in September and remained an outstanding issue in Anglo-American relations throughout the fall. British participation in a French-led intervention in Mexico caused great apprehension amongst Northerners who viewed the Mexican venture as an attempt to evade the Union blockade and undertake direct contact with the Confederacy.

Throughout 1861, as Washington and London traded jabs across the Atlantic over these issues, Charles Francis Adams was working fervently in the British capital to prevent the Palmerston ministry from interfering with the Union’s war effort. Adams often found himself having to tone down the words of Secretary of State Seward lest the British government take offense at Seward’s often terse and brusque messages. The American minister to Great Britain did a superb job of not only assuring that Great Britain avoided any interference in the conflict, but also performed the vitally important task of keeping the relationship between American and Great Britain a civil and working one. However, the
possibility of one incident igniting a powder keg in Anglo-American relations hovered over Adams's work, threatening to not only push Great Britain towards the Confederate corner but quite possibly foment a third war between America and Great Britain. In early November, such an incident occurred and at once threw into question British neutrality as well as a nearly fifty year long peaceful relationship between America and Great Britain. The months of November and December provided Adams with his most formidable task of the year and were the setting for one of America's most fateful diplomatic events.

THE TRENT AFFAIR AND THE DRAMATIC END TO 1861

During the fall of 1861, as Adams and Seward labored to prevent a rupture in Anglo-American relations, the Confederate State Department grew increasingly frustrated by its failed attempts to gain British or French recognition. The cards seemed to be stacked in favor of the Confederacy. Despite Britain's refusal to make the blockade an issue, the fact remained that cotton would have to be attained at some point in the future. The blockade also threatened to create an international incident between the Union and Great Britain, as British men-of-war loomed ready to defend any violation of the rights of British subjects in the North. Furthermore, the Mexican expedition coupled with mounting pressure in France for cotton left Napoleon pondering over whether to open official diplomatic relations with the South. Most importantly, the series of crises that had played out between America and Great Britain ever since (and even before) Adams's arrival in London led policy makers throughout the North to believe that it would not be long before Great Britain bestowed recognition upon the Confederacy. The Queen's Proclamation of Neutrality, Declaration of Paris negotiations, blockade and port closures debates, results of Bull Run, Bunch-affair, and British participation in the Mexican intervention had all served to create a great deal of mistrust and misapprehension on both sides of the Atlantic. Yet in spite of all these issues, Great Britain, up to November, had maintained its pledge to remain strictly neutral in the contest between the Union and the Confederacy.

It is not surprising, then, that the Davis administration in Richmond decided to dispatch a new diplomatic team to Great Britain and France in the hopes that it would have more success than the Yancey-Mann-Rost trio which had received a lukewarm reception in May. Davis, along with Confederate Secretary of State R.M.T. Hunter, selected James Mason and John Slidell to head to London and Paris respectively in order to accomplish what their predecessors had not: recognition of the Confederacy by the powers of Europe. The two men were appointed in early September and were prepared to depart from Charleston in early October with their new diplomatic instructions in hand. After calculating how best to go about evading the blockading squadron that lay off Charleston's harbor, Mason, Slidell, each man's secretary, and Slidell's family departed on the newly renamed Theodora on the night of October 11 and by October 14 arrived at Nassau in the Bahamas. Before arriving ashore, however, the Confederate envoys learned that a British mail packer was to leave Havana, Cuba that would be able to connect them to Southampton, England. Although they did not arrive in time to catch the already departed British steamer, Mason and Slidell were comforted in the knowledge that they were now under the protection of a foreign flag. The two men and their secretaries thus awaited the arrival of another vessel that could take them to their destination in England.

By the end of October, Mason and Slidell were growing weary of their stay in Havana, where they found the heat to be unbearable, despite the warm welcome they had received in the city. So they were pleased to learn that a British mail packer, the Trent, would be able to sail them to St. Thomas, where they could be transferred to another steamer sailing for England and arrive at their destination on November 28. The travel plans of the Confederate envoys were not a very
well kept secret, however, and fell into the hands of Captain Charles Wilkes, commander of the U.S.S. San Jacinto who was supposed to be taking his ship back to Philadelphia for repairs after having sailed the African coast for a month in search of Confederate privateers. Wilkes made the fateful decision to try and intercept the Trent and take the Confederate emissaries on board prisoners as contraband of war along with seizing the ship itself for adjudication in a prize court. When, on November 8, the San Jacinto spotted the Trent, Wilkes ordered a shot to be fired across the bow of the British vessel. The mail packet kept on going, however, and Wilkes ordered a second shot that exploded much closer than the first had, stopping the Trent immediately. A boarding party from the San Jacinto was sent on board the Trent and announced its intention to capture Mason and Slidell as well as their secretaries. After a few meek attempts at resistance, the aforementioned men accepted their arrest and went somberly on board the San Jacinto where Captain Wilkes greeted them. The Captain was persuaded by Lieutenant D.M. Fairfax to forgo taking the Trent as a prize because doing so would deplete the San Jacinto’s crew, and the two ships parted ways with the Confederate emissaries on board the Union vessel. Wilkes, by not leaving a prize crew on board the Trent, would eventually discover that he had made a grievous error and had lost all claims to a legal seizure. However, that was in the future, and as the San Jacinto sailed north, the Captain was overjoyed with his capture.

News of Wilkes’s exploits did not reach Washington until over a week after the capture of Mason and Slidell. Lyons first wrote to Russell on the subject on November 18, although he could only inform the foreign secretary that Mason and Slidell, with their secretaries, had been captured and taken as prisoners from the British mail packet Trent. The following day, Lyons apprised his superior in London on what position he planned to take over the Trent matter in Washington (which, in fact, was none). "I feel that the only proper and prudent course," Lyons wrote to Russell, "is to wait for the orders which Your Lordship will give with a complete knowledge of the whole case." The British minister to America, however, could not help but notice the “great exultation” exhibited in the Northern press over the capture of the Confederate envoys and believed that this was partly due to the fact that Mason and Slidell had been taken from a British ship. Lyons, who at times was prone to exaggeration in his dispatches to the British foreign secretary Russell, was not placing any undue emphasis on the joy exuded throughout the Union over the situation. When Wilkes arrived in Boston on November 24 with Mason and Slidell aboard, he was given a banquet at the Revere House during which many prominent lawyers and politicians rushed to congratulate the Captain of the San Jacinto and defended his actions as having been entirely legal. Navy Secretary Gideon Welles was among the first to offer Wilkes congratulations and the United States Congress eventually saw it fit to award the Captain a gold medal of honor for his actions of November 8.

Adams received the news of the Trent situation while visiting a British acquaintance’s countryside home. A telegraph from Adams’s secretary at the legation, Benjamin Moran, was handed to the American minister to Great Britain just as he was about to head out on a trip to see some of the local ruins. “The consequences necessarily rose up vividly at once in my mind,” Adams recorded in his diary that night. While acknowledging that Wilkes’s actions were possibly “justified in the doctrines of Great Britain,” Adams believed that this would “scarcely make up for the loss of popular sympathy in England.” Although the news understandably shocked Adams, both he and the Palmerston ministry were well aware of the possibility that an American vessel would try and capture the Confederate envoys. For the British government knew of Mason and Slidell’s expected arrival in November just as much as the Lincoln administration was aware of the envoys’ departure from Charleston in mid-October. On Tuesday, November 12, the prime minister had summoned
Adams to a meeting at his Cambridge House in Piccadilly. After greeting Adams in a "very cordial and frank" manner, Palmerston immediately got to the substance of the meeting. The aging British statesman had been "made anxious" over reports of a United States naval vessel, the James Adger, sitting outside English port of Southampton that was purportedly there in order to intercept the Confederate envoys then on their way to London. Palmerston told Adams that the Captain of the James Adger, "having got gloriously drunk on Brandy on Sunday," was set up at the mouth of the river "as if on watch." While not pretending to know the legal pretext for the vessel’s right to take Mason and Slidell prisoners, the prime minister believed that such an action would be highly unfavorable to America’s image in Great Britain. Furthermore, Palmerston believed it to “surely be of no consequence whether one or two more men were added to the two or three who had already been so long here.” The British government, Palmerston concluded, had already made up its mind not to entertain official intercourse with Confederate emissaries, and the arrival of Mason and Slidell would do nothing to alter its decision. The American minister, who had already been in contact with the Captain of the James Adger, informed Palmerston that the ship’s mission was not to capture the Confederate envoys but to take the Nashville, a known Confederate blockade runner which just so happened to be carrying Mason and Slidell. However, having been informed that the Confederate emissaries were not on board the Nashville, which was nowhere in the vicinity of England, the Captain intended to sail back to America.

This conversation with Adams did a good deal to alleviate the prime minister’s concerns over an American vessel intercepting the newly appointed Confederate commissioners. On the same day as the Palmerston-Adams interview, the Crown Law Officers, at the request of Palmerston, looked into the legality of the potential seizure. Their conclusions were as follows: United States naval officers had the right to board a British mail ship, review its papers and mailbags, and take the ship for prize adjudication if found to be carrying dispatches of the enemy. However, if Mason and Slidell were removed and the ship was allowed to continue on its voyage without being claimed as a prize, the seizure would be illegal under international law. Of course, this final scenario was precisely what occurred on November 8, however at the end of November there were many issues that remained unclear with regard to the Trent affair.

On November 29, after rushing back to his duties at the American legation in London, Adams met with Earl Russell who was searching for any information he could get on the Trent matter. Adams, a little embarrassed by his own lack of knowledge on the situation, told Russell "not a word had been whispered" to him on the subject. The meeting lasted only 10 minutes as it was obvious that Adams knew little more than what was being reported in the London newspapers, while Russell’s dispatches from Lyons provided the bulk of the foreign secretary’s knowledge. Upon examining the London newspapers the following day, Adams learned, much to his chagrin, that the Crown’s Law Officers had “modified their opinion as I supposed, and now the dogs are all let loose in the newspapers.” The law officers had decided that because Wilkes did not condemn the entire ship as a prize, the capture of Mason and Slidell was unlawful and a direct affront to the British flag. “The tone now taken,” Adams sorrowfully recorded, “is of such a kind that I must make up my mind to vacate this post some time in January.” The American minister was convinced that the Trent affair would be the straw that broke the camel’s back in Anglo-American relations and prepared to arrange for his departure.

Immediately after his meeting with Adams on December 29, Russell attended a meeting of the cabinet to discuss what should be done with regard to the Trent situation. The cabinet members were outraged by the entire set of circumstances; they saw the facts as being that an American vessel had forcefully boarded a neutral British mail packet, illegally captured four of its passengers, and forfeited all claim to le-
gality by not claiming the entire vessel as a prize. After several tense meetings, the ministry adopted a dispatch to be sent to Lyons that sought the immediate release of Mason, Slidell, and their secretaries, along with a formal apology from the United States government. It was decided that Lyons would deliver these demands to the Lincoln administration, and if after one week it refused to make the necessary reparations and offer a formal apology, the British minister at Washington was to take his leave of America.

On November 30, the cabinet met to complete the dispatch that was to be sent to Lyons in Washington. Prince Albert, husband of Queen Victoria and one of her most trusted political advisers, had been informed by Chancellor Gladstone of what the ministers planned to demand of the United States. In what was the prince's final memorandum (for he would collapse on December 2 and die on December 14), he suggested that a much more conciliatory tone be taken towards the United States in the patch that Lyons would present to Seward. The prime minister, upon reading the Prince Albert's memo, wholeheartedly agreed, and the resulting dispatch, containing the British demands for reparations as well as the demand for a formal apology, reflected an earnest desire to maintain the peaceful relations that marked the relationship between America and Great Britain during the past several decades. The final dispatch, written by Russell, gave an account of all the pertinent information of the Trent case known to the British government and referred to the seizure of Mason and Slidell as "an affront to the British flag and a violation of international law." However, the British government was willing to believe that the Captain of the San Jacinto had acted either without orders from the United States government or had misinterpreted his orders. For, the ministry believed, the American government was far too wise to believe that Great Britain would allow such a flagrant offence go unnoticed. Surely, the dispatch continued, the Lincoln administration realized that "the British government could not allow such an affront to the national honor to pass without full reparation." These reparations entailed the release of the four prisoners incarcerated at Fort Warren in Boston as well as "a suitable apology for the aggression which has been committed." If Secretary of State Seward did not freely offer these terms to the British government, via Lyons in Washington, the British minister to America was to propose them to the secretary. These were the orders that Lyons received in Washington in mid-December. Upon their delivery to Seward, Lyons was to wait no more than seven days for a reply, after which he was to demand his passports from the American government.

As Russell's instructions to Lyons made their way across the Atlantic, both the Palmerston ministry and Adams knew that the reply would be a good deal of time in coming. Approximately four weeks would be needed just for the dispatches to make their way across the Atlantic and back to London, and even if Lyons handed the demands to Seward the day he received them the Lincoln administration still had a week to deliberate upon them. This created a minimal five-week interval for Adams to languish at the American legation in London knowing he was powerless to control the outcome of the situation. This was in large part due to the fact that Seward had suddenly ceased to provide his representative to the British government with any solid information that Adams could have used to combat the mounting tide of anti-American sentiment in England. Adams, however, was doing all he could to keep his superiors in Washington apprised of British public opinion, as well as what course the Palmerston ministry was likely to pursue in the matter. "The pride of the British nation is deeply touched," Adams wrote to the secretary on November 29. In a separate dispatch written on that same day, the Bostonian informed Seward that the Crown's Law Officers had decided that by not seizing "papers and things," Wilkes had forfeited his right to seize persons on board the Trent. "In other words," Adams mused, "Great Britain would not have been offended if the United States had insulted her a good deal more." Regard-
less, Adams told Seward that he believed the British government would demand an apology and the release of Mason and Slidell as reparations for the illegal act by Wilkes. The American minister was certainly doing his job by providing constant updates of the situation in London to the State Department in Washington; however, in the American capital, Seward grew strangely quiet with regard to what the government was planning to do over the Trent issue.

Throughout December, Adams repeatedly lamented both in his diary and letters to acquaintances that he was grossly uninformed on the Trent affair and therefore could do little to defend his government. When in early December the liberal British M.P. for Yorkshire William E. Forster, the leading champion of the Northern cause in the House of Commons, stopped by to see if there was anything he could learn from Adams that could lessen the anti-American rhetoric in England, the American minister was forced to confide that he knew only what the newspapers were reporting. Adams wrote bitterly to Seward on December 11, complaining of a lack of information from the State Department on such a dangerous and explosive issue. The American minister told his superior that his dearth of intelligence on the Trent issue placed him in "a predicament almost as awkward as if I had not been commissioned here at all." Indeed, the only dispatch that Adams received from Seward that provided any intelligence on the Trent affair did not arrive until mid-December and was hardly enough to allow Adams to form a justification of the government's policy. Seward told Adams that "Captain Wilkes...acted without any instructions from the government," leaving the Lincoln administration "free from the embarrassment" that it would have incurred had Wilkes been acting in accordance with orders issued from Washington. The secretary accounted for the lack of information from Washington as being necessary because the administration wished to learn the British opinion on the matter before acting. Having hardly given Adams a sufficient overview of the situation, Seward concluded the dispatch by telling Adams he would not object to the American minister reading its contents to Russell.

After receiving Seward's dispatch on December 16, Adams immediately scheduled a meeting with Russell in order to provide the Palmerston ministry with Seward's most recent views of the situation. On Thursday, December 19, Adams met with the British foreign secretary in order to read to him Seward's dispatch concerning the Trent affair. At a three o'clock meeting in Russell's Downing Street office, Adams read word for word off the secretary's recently arrived dispatch. He was sure to emphasize to Russell that Wilkes had not acted under any orders from the United States government but had taken Mason and Slidell completely on his own volition. Adams then asked the Englishman what course the British government had opted to take. Russell told Adams of the two dispatches that had been sent to Lyons at the beginning of the month, the first with the British government's demands and the second giving the British minister at Washington a one week interval for the Lincoln administration to provide a reply. If this week was allowed to pass without a proper answer, Russell continued, Lyons was to proceed back to England, however this did not necessarily imply that hostilities were a foregone conclusion. Much would depend on the American answer, Russell indicated, and Adams perceived that the ministry was not entirely desirous of war with America despite the violent and threatening rhetoric emulating from the London press. For the first time, Adams was beginning to feel that there could possibly be a peaceful solution to the Trent issue.

Adams's newfound optimism in late December reflected his personal doubts about the wisdom of provoking the world's greatest naval power at a time when America was beset with its own internal difficulties. The American envoy to the Court of St. James, ever since he first heard the news of Wilkes's actions in late November, was highly dubious about the legality of seizing Mason and Slidell, as well as the precedent it might establish for future cases involving
the United States. In a letter to John Motley, Adams pointed out that America had long been a champion of neutral maritime rights. Thus, no matter how many precedents or laws could be cited in America's favor, it would be difficult to ignore British complaints because America might very well some day find itself in the shoes Great Britain now stood in. In a private letter to Seward in early December, Adams acknowledged that a strong argument against Britain's claims could be made and even based upon British treatment of American neutral vessels in past conflicts. However, Adams saw little value in "varying from what seems to me so honorable a record, under the temptation of a little ephemeral success. ...Our Neutral rights are as valuable to us as they ever were whilst time has reflected nothing but credit on our own steady defence [sic] of them against a superior power." Only a little over two weeks since word first arrived of the Trent affair in England, Adams warned the State Department that preparations for war were rapidly progressing in the British capital. Many Londoners, Adams wrote to Seward, believed that America was pushing the limits of Great Britain's patience, and the American minister urged caution in Washington lest the Union bring Great Britain into a de facto alliance with the Confederacy. It is obvious from Adams's personal reflections, private correspondence, and official dispatches to Washington that Adams, the direct descendant of two American Presidents, was not willing to sit idly by as his government blundered into a third war with Great Britain.

Adams's letters to Seward urging restraint and caution arrived on the same vessel, the Europa, which carried a special messenger, Captain C.C. Seymour, who was to deliver to Lyons the British instructions. After receiving Russell's instructions at 11:30 p.m. on December 18, Lyons paid a visit to Seward the next day in order to unofficially communicate to him the terms of the British demands. The secretary requested that Lyons delay making the official presentation of Russell's dispatch for two days, when on December 21 Seward would be ready to accept it and the seven days interval could begin. Lyons agreed, and in a summary of the conversation wrote to Russell that Seward "begged me to be assured that he was very sensible of the friendly and conciliatory manner in which" Lyons had made the communication. However, when Lyons appeared on Saturday, December 21 as Seward had requested, the secretary again pleaded with the British minister to allow him two more days before the official British ultimatum was delivered to the American government. Lyons again acquiesced to Seward's appeal and thus made the official presentation of the British government's demands on Monday, December 23.

The Lincoln administration received plenty of advice from outsiders on how to settle the Trent issue during the month of December. From New York City, George Opdyke wrote to the President, expressing his concern that Great Britain would soon "commence hostilities" without a formal declaration of war and pressing the president to upgrade the city's defenses. Millard Fillmore urged the President to avoid the "double calamities of civil and foreign war" by making a "firm but conciliatory argument" to any English demands. Meanwhile, James Doolittle proposed to Lincoln that the matter be brought before the Emperors of France and Russia, "to determine the question whether upon the law of nations we were not as belligerents justified in making that arrest." The president himself was not entirely sure how to approach the situation, and in his customary fashion wrote out a memorandum on the subject that never saw the light of day. In it, Lincoln wrote that if Russell's November 30 dispatch to Lyons was in fact correct and contained all the "pertinent" facts to the case, reparations to Great Britain were indeed "justly due." The United States government, Lincoln continued to himself, in no way meant to offend the British flag or force Great Britain into dealing with this "embarrassing question." However, the Union government had rights as well, and reparations should only be made when it was proved that the act was "wrong, or, at least, very ques-
tionable." From this memorandum, it seems that Lincoln was not willing to simply give in to the Palmerston ministry's demands and might have even been considering taking the matter before an international court.

The president, though not once making any reference to his private memorandum, brought this viewpoint to a special cabinet meeting called for Christmas Day, December 25. Despite this inclination to bring the matter for arbitration, the president and his cabinet were convinced by the secretary of state that it was of the utmost importance to acquiesce to the British demands without delay. Arbitration would take months to play out, and it was obvious from Russell's dispatch to Lyons that the Palmerston ministry would only give the administration one week to come to a decision on the matter. Furthermore, it had become evident that America could expect no support from Europe on the Trent matter. Seward came to the meeting bearing in mind Adams's warnings from earlier in the month. The secretary's London representative had offered up several cogent points to the matter, not the least of which was the precedent it would establish for future cases. Moreover, Adams's warnings concerning war preparations in the British capital must have had a profound effect upon Seward and the rest of the cabinet, who were not oblivious to the fact that America would be incredibly hard pressed to fight a war against Great Britain coinciding with a struggle against the Southern rebels. Facing this daunting possibility, the cabinet agreed that Seward would draft a dispatch to Russell in which the secretary would only give the administration one week to come to a decision on the matter. Furthermore, it had become evident that America could expect no support from Europe on the Trent matter. Seward came to the meeting bearing in mind Adams's warnings from earlier in the month. The secretary's London representative had offered up several cogent points to the matter, not the least of which was the precedent it would establish for future cases. Moreover, Adams's warnings concerning war preparations in the British capital must have had a profound effect upon Seward and the rest of the cabinet, who were not oblivious to the fact that America would be incredibly hard pressed to fight a war against Great Britain coinciding with a struggle against the Southern rebels. Facing this daunting possibility, the cabinet agreed that Seward would draft a dispatch to Russell in which the secretary would meet the British foreign minister's demands.

Seward's reply to the British demand for the release of Mason and Slidell, completed the day after the Christmas morning cabinet meeting, was a comprehensive summary of Wilkes's actions and an analysis of their legality. Seward informed the British government that it had "rightly conjectured" that Wilkes had "acted upon his own suggestions of duty, without any direction or instructions or even foreknowledge of it, on the part of this government," thus relieving the government itself from all responsibility for the actual seizure. Seward pointed out several facts which Russell had neglected to include in his November 30 set of demands, namely that the four captured men were "pretended commissioners" sent by a "pretended" president, Jefferson Davis, to Great Britain and France in order to persuade those nations into recognizing the insurgent authorities at Richmond. The men were also carrying "pretended credentials and instructions, and such papers are in the law known as dispatches." Therefore, Wilkes's actions should be seen "as a simple legal and customary belligerent proceeding," instead of "a merely flagrant act of violence," as they were portrayed in England.

The secretary of state put forward five questions relative to the seizure of Mason and Slidell: 1) Were Mason, Slidell, and their dispatches contraband of war? 2) Did Wilkes have the lawful right to stop and search for Mason, Slidell, and their dispatches? 3) Did Wilkes exercise that right of search in a lawful and proper manner? 4) Did Wilkes have the right to capture Mason and Slidell? 5) Was the right of capture exercised in accordance with the law of nations? If all five of these questions could be answered in the affirmative, Seward continued, then Great Britain would have no right to claim reparations. After answering the first four questions with a "Yes," the Secretary took up the last and most important question. Did Wilkes exercise the right of capture according to the guidelines of international law? For if he did not, then questions one through four would become irrelevant, and Great Britain would be fully entitled to the reparations which it sought. Seward concluded that by not taking the Trent to prize court for adjudication, Wilkes had "prevented the judicial examination which might otherwise have occurred" in the affair. The Captain had voluntarily given up his claim to a legitimate capture, just as the Crown's Law Officers had decided in November and just as Adams had surmised in his dispatches to Seward in early December. "I have fallen into an argument against my own country," Seward wrote,
"but I am relieved from all embarrassment on the subject." Mason, Slidell, and their secretaries "will be cheerfully liberated," Seward concluded, once Lyons named a time and place for their departure.

Upon receiving the secretary's note on the morning of December 27, Lyons immediately sent a dispatch to Russell, informing the foreign secretary, "I consider that the demands of Her Majesty's Government are so far substantially complied with...and [will] remain at my post until I receive further orders." After several days of debating where the most suitable place would be for the prisoners to depart without causing a violent scene, it was decided that the small Massachusetts town of Provincetown would provide the ideal location. On January 3, in a brief dispatch to Russell, Lyons was able to inform his superior in London that "Mr. Mason and Mr. Slidell and their two companions sailed from Provincetown on board Her Majesty's ship Rinaldo at five o'clock the day before yesterday." Although poor weather would prevent their arrival in England until January 30, the four ex-captives were free from their nearly two month long imprisonment. More importantly, war with Great Britain had been averted by the Lincoln administration.

The news of the diplomatic settlement reached London officially on January 8. The word quickly spread like wildfire throughout England, causing church bells to be rung, theater audiences to burst into applause, and buoyant Britons to congratulate themselves on having avoided a war with America. Adams, though slightly less jubilant than his English counterparts, nevertheless recorded in his journal that "the danger of war is for the present removed. I am to remain in this purgatory a while longer." His tone was modified the next day when, upon reading Seward's dispatch, he believed that "traces of my dispatch" from early December could be found in the secretary's decision. Two days later, Russell showed Adams a copy of a dispatch he intended to send to Lyons, accepting the American reply. The American minister responded by reflecting that he was "very glad this was so well settled," to which Russell assented "in the same view, and hoped that nothing was left in the way of continued peace" between the two nations.

Adams was correct in his belief that Seward had paid close attention to his warnings in early December. Even though Adams felt slighted by the lack of information he received from Washington, he had performed more than ably in keeping his superiors informed of the public and political sentiment pervading throughout Great Britain in the wake of the Trent news. Furthermore, Adams's astute remarks about creating precedents, which in the future could do more harm than good to America, were not ignored by the secretary of state. In Washington, Seward and Lyons both did a good deal to preserve peaceful relations between America and Great Britain. Lyons's forbearance in officially presenting Seward with the British ultimatum allowed the Secretary to develop a more forceful argument against rejecting the British demands. Seward himself deserves commendation for realizing that America had to submit to Great Britain's demands in order to avoid a war with the world's most powerful nation, despite cries from Congress and cabinet members that Mason and Slidell should never be released. While it will never be known what would have happened had Seward and Adams been unable to convince the cabinet and the president to accede to the British government's claims, public sentiment had been so aroused in England as to quite possibly make further relations between the two nations impossible. Adams, for one, clearly believed that if his government did not satisfactorily comply with Russell's November 30 dispatch to Lyons, his presence in London would be of no further use. Although he was not entirely convinced that war would necessarily follow an American refusal, Adams realized that the Lincoln administration could ill afford to incur even the diplomatic wrath of Great Britain when America was in such a state of internal turmoil. Thus, while unable to in any way alter the Palmerston ministry's actions in London, Adams was able to influence Seward's actions in
Washington through his private and diplomatic correspondence with the Secretary. At a time when patriotic fervor ran rampant through both capitols, the American minister to Great Britain put aside all such emotion and passion in order to rationally argue against what could have caused a devastating breach in Anglo-American relations.

The Trent affair was the low water mark of Anglo-American relations in 1861 and almost led to a trans-Atlantic conflict that quite possibly would have ruined any hopes the Lincoln administration had of restoring the Union. Its successful resolution, due in no small part to Adams’s warnings and advice from London, allowed the Union to momentarily put foreign matters on the back burner and focus on stepping up its war effort against the Confederacy. As 1862 progressed and the Union naval and land forces recorded numerous victories, it became clear that Great Britain would not intervene in the Civil War so long as hope remained for a Northern military victory. In late January, Adams reflected upon the settlement of the Trent affair as having staved off British attempts at interference in America’s domestic matters. “The army will have time to determine the question,” Adams gladly recorded in his diary. Indeed, when news reached London of the fall of Forts Henry and Donelson in early March, along with the Battle of Pea Ridge later in the month, Adams noted the upswing in pro-Unionism throughout the British capital. “Nothing shines so dazzling to the military eye of Europe as success,” Adams wrote. “Our English friends appreciate it as fully as any body.” At a dinner party in early March, Adams “was congratulated all around” by newfound well-wishers of the Union. “Even Lord Palmerston seemed to doubt his former judgment,” Adams cheerfully noted. The first half of 1862 was indeed an extraordinary one for Northern forces, and news continued to pour into England of the Union’s military prowess. Late April and early May were filled with talk of the Battle of Shiloh; on May 11, Adams received word of the capture of New Orleans by Union forces under Admiral David Farragut; two weeks later, the capture of Norfolk was the talk of the town in London; early June witnessed news of the rebels being “driven out of Corinth.”

Of course, the Union did see its share of military failures in 1862, perhaps none worse than the rout of soldiers under General John Pope at the Battle of Second Bull Run in late August. In September and October, the British cabinet, led by foreign secretary Russell, seemed to move ever closer towards offering recognition to the Confederacy and the results of the second defeat of Union forces near Manassas Junction, Virginia served to lend further weight towards a call for an armistice followed by recognition of the Confederacy. However, as the intervention clamor reached a peak in the Palmerston ministry in November 1862, British secretary for war George Cornwell Lewis cited historical precedents in order to justify non-intervention and was able to dissuade Earl Russell from recognizing the Confederacy. Palmerston also remained cautious in meddling with American affairs and never truly supported full-fledged recognition of the rebels during the 1862 intervention crisis. Despite initial doubt over the outcome of the Battle of Antietam, September 17, 1862, Englishmen ultimately realized that the battle was a turning point in the American war. Similarly, initial hostility towards the Emancipation Proclamation, viewed by many in England as a desperate attempt to incite a servile insurrection in the South, eventually gave way to acceptance of the measure as a vital step in the fight against slavery. While it was not clear to contemporaries, the autumn and early winter of 1862 ended any serious hopes that the Confederacy had for British intervention or recognition.

Although 1862 may have seen Great Britain teeter on the brink of intervention, 1861 was one of the most strenuous years in Anglo-American relations since the two nations had been engaged in battle almost fifty years prior. Almost as soon as the Lincoln administration stepped into office it was forced to deal with British recognition of Confederate belligerent rights. Even before the newly appointed minister to Great Britain had arrived in London, the British foreign sec-
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sequences. Whether this was accomplished through a small act such as dressing in silk and lace to please British high society at the Court of St. James or an enormous decision like urging his government to ignore public sentiment and abide by the British demands during the Trent affair, Adams always sought what was most beneficial for America in his first year in London. Although the end of 1861 by no means signified the end of difficulties in the relationship between America and Great Britain during the Civil War, Adams's success in maintaining a stable, civilized connection between the governments of both nations was a vital contribution to the Union's diplomacy during the Civil War.
The Sweet Life: Maple Sugaring In Massachusetts

BY AMANDA FORBES

Abstract:
The following piece is an excerpt from a larger Honors Thesis project. This thesis explores the history and culture of maple sugar farming in Massachusetts from the personal perspective of the writer's own experience growing up on a maple sugar farm in Southeastern Massachusetts. Through a combination of ethnographic research methodologies and memoir, this thesis argues that farm life lends itself to tight knit family structures, and, reciprocally, farm life requires a tight knit family to succeed as a lifestyle and as a business. Finally, this thesis suggests that the tradition of maple sugar farming is in danger of disappearing in Massachusetts because the essential elements of a successful maple farm, access to land and enough people to tend to it (i.e. family) are in increasingly short supply, particularly in Massachusetts where it is both expensive to buy land and expensive to live on it. This thesis was funded by an Adrian Tinsley Program for Undergraduate Research semester grant.

The Sweet Life: Maple Sugaring In Massachusetts

Chief Woksis threw a tomahawk into a tree one cold night. The next day was much warmer, and, as he removed the tomahawk, he noticed a liquid dripping from the tree. He placed a hollowed out log under the tree to collect the clear liquid. Then he boiled his dinner in it. The syrup gave a rich maple flavor to the meat as it cooked.

From then on the Native Americans slashed trees to get the sap to cook with.

In order for a tree to release sap, there must be cold nights followed by warm days. The cold nights freeze the sap in the trees, and the warm days thaw the tree, allowing the sap to move and pour out of a cut in the tree. Once the sap is
drawn, all the water must be evaporated from the sap. Sap is mostly water, with a very low sugar concentration. As the water leaves the sap it becomes thicker and stickier leaving behind dark sugar syrup: maple syrup.

The Anishinabe Indians of Minnesota tell the story of innuatig, the man tree, who explained how we came to have maple syrup. After a long winter, a starving family was waiting for spring to come. They would have to wait until everything melted in order to find food. Then they heard a tree cracking and creaking in the wind. They heard a voice that said it would teach them to make a food that would prevent them from starving. It was the voice of the tree man who told the family to cut his bark and collect the liquid that came out of it. He told them it would be clear and cold and would have sweetness to it. They'd have to boil it until it became dark and thick. The family lived off of the syrup and the man tree’s advice. The Anishinabe tell this story during a thanksgiving held each year to give their thanks to the man tree and the other plants and animals that they depend on.

In another Anishinabe story the world was just created, and Gitchee Manitou made life easy for people. The Anishinabe people of the Great Lake region simply had to break a maple tree branch in order for thick syrup to drip out of it. Manabozho, their leader, went to visit his people, but he could not find them. They were not hunting or working in the fields. He found them laying under maple trees so that thick syrup could drip into their mouths. Fearful that this would make his people lazy and fat, he took a big bucket made of birch bark to the river. He went to the top of the maple trees and poured water over the trees, making the syrup thin and watery. The Indians had to collect sap now and boil it. To make them appreciate the syrup even more, he made it so that the trees would only drip sap at a certain time of the year.

The Algonquin Indians showed settlers how to make syrup. The Indians not only ate the syrup, they also used it as energy-building medicine. Old Nokomis, grandmother of Hiawatha, showed a tribal hero, Manabusha, how to tap a tree. When they tapped the tree, thick syrup came out of it. Manabusha felt that since getting syrup was so easy his people would not appreciate it. So he climbed to the top of the largest maple tree and poured water over it. This diluted the syrup and left a clear liquid sap. He showed his people how to chop firewood, make a fire, carve out bark kettles, and stir the sap while it boiled; this, he taught them, would make precious maple syrup.

He did all this because Manabusha didn’t want lazy people. He couldn’t have a tribe that did not work for their needs. It would make them lazy, and that was unsuitable.

Each year the Indians would hold a holiday festival when they began tapping trees. When they tapped a tree, they would insert a hollow reed pipe into the tap, a cut in the bark. These pipes flowed into wooden troughs, often hollowed out logs. The sap was poured into green, birch bark kettles and hung over a small fire. For several days this sap would boil until it was thick syrup. When the French gave the Indians iron kettles in trade for fur, the Indians were able to boil sap quicker, and they began to produce more. They were even able to make a maple cream. After boiling the syrup they cooled it in a trough, and then stirred it with a wooden paddle, or kneaded it with their hands. Once the substance was creamy they would pour it into birch bark molds and store it for use later in foods.

My dad, Richard Forbes, grew up working as many jobs as he could to support his mother and brother. He was responsible for all the bills, so he would work any job he could get. Hard labor was the only type of work he could do. He sold newspapers or repaired car transmissions. He spent his youth under the control of terrible bosses who didn’t pay enough and didn’t care. At 18 he opened his own business called Dick’s Landscaping, which evolved slowly into Forbes Fence Company in 1978, at age 26. I vaguely remember it. I was a baby. When he learned that there were natural springs on our property, he paid to test the water to see if it was fit
to drink. He would have rather owned a water company than the fence company because it would require less physical labor. When the water was approved in 1988, he opened a mini-vending machine in front of the fence company building. It was too hard to move the water from the spring to the vending machine. So he tried to have trucks come to our house to buy it. When this didn’t work, he bought the Dairy Maid, a nice ice cream parlor about a mile from our house and our woods. He was able to put pipes underground from our house to the Dairy Maid so that he could sell the water outfront of the store. Throughout all this my mother followed along, and my brother and I did as well. When the Dairy Maid became unbearable, we began a new adventure. We opened a maple sugar farm. We still own it. As the land gave to others it now gives to me and mine. This is the story of how maple syrup saved a family. Chief Woskis, Ininatig and the Anishinabe, Richard Forbes—this is my father’s story.

By the Llamas, Over the River, Next to the Springs, Through the Woods... Back to the Sugar House: A Tour of the Farm

Matfield Maple Farm is tucked away, hidden in the small town of West Bridgewater Massachusetts. Our maple farm is located on a busy road; you can always hear the cars roaring by, unless you are deep in the woods. I’ve lived in the town of West Bridgewater, Massachusetts my entire life. The house that I live in is about 100 years old. It was built before Matfield Street, where it is located, was even paved. The property we live on is beautiful. Pulling into my driveway, down the slope, you see an open field and vast numbers of trees. This land has a natural sugarbush on it. A sugarbush is not just a bush, but rather a place where many maple trees grow together. My dad was thrilled when he realized that these maple trees grew naturally: Mother Nature’s plan for a maple syrup farm.

It’s unusual for sugarbushes to grow so close to the ocean. West Bridgewater is about 40 minutes from Cape Cod. As you travel toward the Cape, the soil becomes sandier. Maple trees can’t grow in sand. Most maple farms are in Western Massachusetts, but my father attributes this phenomenon to the fact that our sunken down land, with her natural springs, has its own little micro-climate.

The Dairy Maid Aspect of Life

The fish bowl, as we used to call it, would be hot and sunny during the season. The small serving area was encased by windows so that everyone could watch your every move. The only privacy was in the stock room or office in the back. Customers would line up at a small square window and wait in line, a line that, on hot summer nights, could extend 15 or 20 people deep. Usually we had two windows open, and when each line had about 15 people in it we would open a third window if we had the manpower to operate it.

The Dairy Maid was only open for a short season. In the winter we needed to rely on the Water Company and firewood sales to make ends meet. We had bills to pay at home, and we also had to pay an overpriced lease for the building the Dairy Maid occupied. My parents worked day and night all year round. As I grew older, I began to be at the shop more and more. My parents relied on me to help them. I knew no other way. The Dairy Maid consumed a large portion of our everyday life; it was all consuming and never ending.

A New Adventure

During the winter and early spring, while the Dairy Maid was closed, my dad would go out in the woods around our home tapping trees. Tapping a tree is when you drill a tiny hole into the tree and insert a metal tap, which allows sap to drip out of the tree into a bucket. My father was a risk taker. He began talking about turning his hobby into a profession.

To open a maple sugar farm seemed crazier and harder than owning an ice cream parlor. At least people had heard of such a thing as owning an ice cream store, but a maple sugaring farm? We were not supportive. Farms today are rare, never mind a maple farm on the southeastern coast of Massachusetts.
One winter, when I was 17, the owner of the Dairy Maid building we rented came to tell us he was increasing the rent again. Seeing no way to pay the rent, the odd became the only solution. But we did not see my father’s vision.

“A maple farm? This is crazy!” Those two phrases sum up my thoughts when my parents told us that we were going to open a maple farm on our own property using our trees in the woods. They might as well have said we were about to jump off a cliff. My dad assured us that this farm would be successful, and that, even if it wasn’t, we would always have the water company and the fence company to fall back on. It actually seemed to fit in perfectly with my dad’s fence company since you couldn’t install fences in the winter, and a lot of preparing for the maple season is done in January. It would give us something to do.

And most of all, it wasn’t the Dairy Maid.

I was still skeptical, although I never voiced my hesitation. My dad had been sugaring for a few years as a backyadder, a person who makes maple syrup just to do it. My dad said that this maple farm was just a hobby that went “aluck.” I’m guessing that aluck means his hobby went better than he had thought. Sometimes my father makes up words; it’s a testament to his character: he’s not afraid to try something new if he feels it suits the situation. He wanted to do something to keep the land as natural as possible, to protect our spring watersource. And what else can you do with a bunch of trees? He’s right, of course; unless you plan on cutting down all the trees, there’s not much to do with them besides look at them. My father likes to tell people that “trees clean the water and the water helps the trees grow. We focus on renewable resources, sustainable agriculture. We’re putting the land to work.”

My dad was just going to expand his maple hobby into a business. Many people do that, right? He bought books on maple syrup and began to create this world he pictured in his head. He tapped the trees behind our house and hooked up buckets under them when I was about 15, while we still owned the Dairy Maid. I’ll admit, it was fascinating to see the clear sap drip out of the trees. But we were struggling to pay our bills and couldn’t go out to buy an evaporator. An evaporator is the proper large stove used to cook sap into syrup. It could easily cost upwards of fifteen thousand dollars. He began building an evaporator since we couldn’t afford to buy one. After maple sugaring had been his hobby for awhile, we couldn’t boil sap on the stove anymore because we boiled so much maple syrup on it that it slowly died. He labored many hours over that machine. Walking into the barn and seeing him weld this huge awkward machine was both frightening and amazing. Everything depended on my father’s ability to pull this off. I was rooting for him; I was. But I still wasn’t sure. It wasn’t the Mercedes of evaporators, but it got the job done. And he built it himself. I remember my brother saying that my father “could fix a broken rock.”

When we were just beginning this journey we had the tapped trees hooked to buckets. The sap drips out of the tree and into the buckets. The buckets get full and must be emptied. Since the trees are deep into the woods, and our sugar shack, the gift shop, is next to our house, it was difficult to carry the five gallon buckets through the mud and snow back and forth all day.

My dad would put everyone to work who came to our house: my friends, my brother’s friends, our family—anyone he could convince to head out into the woods would be carrying a bucket of sap from the woods to the sugar shack.

My friends hesitated to come to my house during sugaring season.

As our operation became larger it became too difficult to handle all the buckets. On a good day, a tree could pee, as my father calls it, and fill up the buckets two or three times. So my dad had to upgrade our small farm if we wanted to continue filling maple syrup bottles for out little gift shop that he was thinking about opening. He invested in a vacuum system. This system used tubing to connect the tapped trees and feed the sap into a collection tank. As the trees drip sap,
the liquid goes into the collection tank and, from there, the sap is sucked up by the vacuum pump to a larger tank that is behind the sugar shack. From there the sap flows into the evaporator, the large stove that cooks the sap, at a controlled rate when you turn a valve. I no longer had to go into the woods to lug sap buckets.

I didn't know if things were working out financially once we had left the Dairy Maid. But my family seemed okay. We were together. We were outside on our land. We weren't pushing ice cream. And my father seemed happy.

In 2000 we sat down for a family talk. My dad felt that our gift shop and business could profit from giving tours. This made me nervous. There were already people who came to our gift shop to buy syrup. Tours meant that we were inviting the public to come over to our home, and be entertained for an hour. I wasn't sure how this would work. My dad assured us that this was the best decision to make. My brother didn't have much to say about it, and my mother, always along for the ride, supported it. I was uncomfortable, but what else could we do? It was the only way to bring large numbers of people to our farm. We had about 500 trees tapped and a nice tour route that people could venture through if they wanted to see the process. It was time, after years of backyarding and expansion, to open our farm to the public, time to expose our family and efforts to the supporters and the critics.

In the Spotlight—Once Again

During the sugaring season, in March, we give tours of our operation to the public. The first stop is the natural artesian spring. All the children, and most adults no matter how cold the air is, will take a drink from this natural spring water. The water shoots up, right out of the ground. Over the first bridge and through the mud we walk until we reach the maple grove. People's eyes grow wide when they see the maze of bright green tubes that connects the trees. The path loops out of the woods around and back up to the llamas.

Some folks stop and talk to the llamas or head into the sugar house to finish the tour with the evaporator.

As people ask questions about this rumbling fiery machine they seem to open up and share their own experiences making syrup or even beer. Generally we're like a small family when we pass around the samples of the finished syrup, and the group continues asking questions and even begins engaging in conversations with each other—perfect strangers become comfortable enough to talk to one another which is not usually a common occurrence—except at the end of a tour.

After the customers purchase syrup they usually hang around for awhile. Even if they are cold they still want to ask just one more question or look at one more item. Some people even leave their phone numbers for us to contact them about various things. When all the customers leave my family is left behind; the people who are the center of this maple syrup farm. We are left with our land growing more beautiful every day.

Now We're Cooking: Matfield Maple Farm after Five Years Open to the Public

I began this project in 2004, after our sugaring season. It's interesting for me to look back at my writing, and to actually think about the season that we're currently in. It is March 2005, and my family's been running around trying to run the maple farm. This year we began on a better foot than ever. We better understand how to make this farm work. It's like when you buy a new pair of shoes. You bought them because you love them, but at first you have to squeeze your feet into them, and it hurts sometimes when you walk. You're learning what clothes or socks look good with them. You're learning when to wear them. After time, they're comfortable and you know those shoes. It took us a long time to get comfortable in our shoes: to become comfortable with our farm.

As a family we all clear our calendars for the weekends in March. Even my brother's girlfriend, Amber, and my
boyfriend, Derek, are now an essential part of our farm. This year we all share the roles and responsibilities of tours from parking cars to selling tickets, to giving the tour, speaking about the evaporator, and operating the gift shop. We’ve also learned that having a tour at noon, and then again at two o’clock, would be easier for us than the previous years; when we had tours every hour from noon to four.

The Future of Maple Sugaring in Massachusetts

Long ago, maple sugar was cherished. My father often jokes that he was born in the wrong century. He explains this stating: “In the 1920's people depended on this [maple syrup] for the country. I think 200 years ago we had a president who thought that every person should plant X number of sugar maple on their property. He planted his own. A law was passed that people must buy maple sugar—not sugar cane. People began tapping trees. This law is still on the books.” I looked into these facts, and found that in fact, we did have a president who cherished maple sugaring. According to Mass Maple Association, “Our third President, Thomas Jefferson, was so much in favor of the United States producing its own maple sugar that he even started a plantation of sugar maples at his home, Monticello.” Also in 1791 “Thomas Jefferson and George Washington discussed plans to start “maple orchards” on their Virginia plantations. Most trees died or failed to thrive; Jefferson remained a maple booster.” These presidents are who my father is referring to. He had read somewhere that Jefferson and Washington were maple supporters. Now-a-days maple farmers are lucky to have customers support them, or their own town, never mind a president.

I could not however find that specific law that my father spoke of. I did find that in “1790 ‘Maple Sugar Bubble’ grows, with high hopes among national leaders that a home grown alternative to slave-produced cane sugar from the British Caribbean had been found. Key advocates for this include Thomas Jefferson, Dr. Benjamin Rush and Judge James Fenimore Cooper” http://www.massmaple.org/. In fact, people did want to use maple sugar rather than British slave made sugar cane. This could be from a humanistic stand point, and also a political one, as the colonies strived for independence from England. Maple sugar indeed was very important a long time ago when our country first began. My father would have been in his glory to have a president to talk about maple sugaring with, or to visit a maple orchard planted by the men that ran the country. That’s a lot of support. My dad’s major support is his family, and customers.

The culture of maple syrup farmers in Massachusetts is one that is diminishing quickly. People do not have the money or time to use their land for a business that is difficult and bears little profit. Most people don’t even have enough maple trees on their tiny properties. Real estate prices are through the roof, and once you buy a house, you have to be able to afford all the bills that come along with it. Most people don’t go out and buy a maple farm; they begin as backyarders. Making the decision to open a maple farm require people to work it too. Hiring help would be too expensive, not even an option for most. That leaves the need for family, which is fine when couples have younger children, but most children want to grow up and leave the nest, not hang around a maple farm. Massachusetts only has about 350 maple producers in the state, and about 80% of them are located in the western half of the state.

It takes very special people to dedicate their lives not to money, but to family and nature. Mrs. Butterworth seems to be the easiest route today, because she can be produced in mass quantities, at cheap prices, requiring little land, and no talent. Consumers can go to any supermarket and pick up this synthetic corn syrup with maple flavoring for about two dollars.

Hopefully, as time goes by we’ll get better and better at running this little farm. I’m happy at where our farm is at the moment. I don’t want it to change too much. I remember making lunch on the weekends in March. We had one hour
before the next tour would show up.

"Hey Amber, grilled cheese?" I would ask my brother Richie's girlfriend. She would nod her head.

"I'd like a grilled cheese, too," Richie would pipe in.

"Mom?" I'd yell.

"That's great."

I know Derek, my boyfriend, would have grilled cheese because he'd eat whatever I was making. Derek and I would head into the house with my mom. I'd get out the skillet and butter the bread.

"One, two, three, four, five" I'd count. "Five grilled cheese sandwiches." Derek would help put the sandwiches together as my mom got out the chips and soda. Amber would pop in and sit at the table.

"That was a good tour. Did you see the little boy who was collecting sticks?" Amber would say as she began to gossip about the tour we just gave. Richie would come into the kitchen and sit down to chat. My mom would use the walkie talkie to call my dad and ask him what he wanted for lunch.

"Tuna fish" he'd say. She would come over to the counter and bump into Derek and me as we made the grilled cheese.

"Derek, can you get the mayonnaise?" She'd ask as she put the bread in the toaster. Amber would get up from the table to get water and ask if anyone else wanted some water to drink.

Throughout all of this my dad would be outside alone watching his evaporator.

"A car just pulled in!" the phrase would echo from Richie and Amber when the dogs outside began barking.

"Forty minutes early. They'll have to wait." I'd say as Derek and I put the sandwiches on plates. My mom would run outside to bring my dad his lunch. She'd come back in and we'd all sit at the table to eat as quickly as possible and talk about the tours, and listen to the dogs bark while the customers sat in their car and waited for the next tour.
Bibliography


Trial by Fire: A Study of Soda-Fire Kiln Construction and Glaze Formation

BY KRISTINA STAFFORD

Abstract

This research was centered around the construction and firing of a soda/salt-fire kiln, the study of glazes conducive to the soda/salt kiln, and production of a strong foundation for a cohesive body of wheel-thrown work in which to glaze and fire. Utilizing my existing ceramics background, I investigated the appropriate techniques and skills to build this kiln and the chemistry involved in the formulation of glazes. The use of porcelain in wheel-thrown forms has broadened my ceramic knowledge and allowed for the implementation of new textural techniques and glaze choices. My body of work in porcelain bisque-ware will be enhanced by the treatment of glazes and use of this specialized firing technique. This tactile approach to research has allowed me the invaluable experience of creation and design preparing me for future graduate research, and the opportunity to share my findings, work, and experiences with others in the ceramic community.

Introduction

This research consisted of three main parts. The first part was designing, building, and firing the kiln. The second part was researching glaze chemistry and testing, and third was the production of quality wheel-thrown ceramic works. The primary focus was to design, construct and fire a soda fired kiln. After researching different styles and fuel options we chose the barrel-arch cross-draft gas-fired soda kiln. My research also included the study of glaze chemistry specifically formulated for this specialized soda fired kiln. I also worked towards creating a cohesive body of ceramic wheel-thrown work consisting of graceful forms focused on the simplicity in form as well as functionality. I created these works to be fired in the soda kiln and to be used for the testing of multiple glazes and glaze techniques.
This research project allowed for personal growth in both artistic and educational arenas. The successful completion and firing of the soda kiln allowed me the opportunity to experiment with new firing techniques as well as explore different forms in clay set in an independently motivated creative working environment. The kiln design and construction along with the study of glaze chemistry has given my research a technical dimension as well as a hands-on one. The personal growth I have made through independent studio time has added to my research, greatly rounding out my experience as well as making it emotionally, physically, and intellectually rewarding.

Methodology/Significance

The design and construction of the kiln includes my partner and fellow potter Derek Hambly. Our research projects overlapped significantly and we chose to work as a team in all aspects of the kiln construction. Derek, having built a kiln in the previous summer, proved a great resource as did the considerable experience of our professors and mentors Preston Saunders and Rob Lorenson. Both Professor Saunders and Professor Lorenson had been involved in several kiln constructions prior to the development of this kiln.

Before the kiln building could start a design had to be finalized so that the proper materials could be ordered. After great debate amongst ourselves along with some very valuable advice from a kiln building supply company in Rome, Georgia we decided on the cross-draft barrel-arch gas-fired soda kiln. Next we quickly decided on the size of the kiln's interior to be about eighteen cubic feet. We chose a smaller kiln to allow for a shorter firing time and because less ceramic work is required to fill the kiln. This allows us more frequent firings. Due to a small ceramic community a smaller kiln is more efficient and practical. The kiln was built behind Woodward Hall on the Bridgewater State College campus.

Our next step included a great deal of math to figure the correct amount of materials and what sizes. When ordering material we had to choose the proper dimensions of the bricks to coincide with the planned interior size of the kiln. We ordered over three thousand pounds of soft and hard brick in several sizes and shapes, as well as self-hardening mortar, and castable refractory mortar to be shipped in from Georgia. At that time we also purchased wood for the frame, cement for the foundation of the kiln and angle iron for the permanent outside support framework. Other materials included; specialized blades to cut the bricks, trowels for the mortar, screws, nails, and so on. After receiving and purchasing all materials we were ready to begin building.

The necessary items, we started construction by mixing and pouring a concrete slab to work as a foundation in the shape of the kiln and to help protect the asphalt ground from the twenty-three hundred degree heat that the kiln would reach during firing. The concrete slab was poured about six inches larger than the actual size of the kiln on all sides to leave room for a permanent support structure to be installed later. Before pouring the concrete we placed re-bar in a criss-cross pattern for additional support. Next we put down a layer of soft brick followed by a layer of hard brick. Soft brick is a lighter, more porous material used as an insulation layer. Over the soft brick we installed a layer of thick hard brick. Hard brick is very dense and heavy and made to withstand extremely high temperatures. The entire kiln is constructed with hard bricks and then insulated with soft brick on the
entire outer perimeter. The soft brick is used as the exterior and the hard brick as the interior because hard brick is much more durable and resilient in regards to longevity.

Next we moved to the construction of the walls including the entrance and exit flues. In building up the walls careful consideration was taken in the size openings left for the flues. The entrance flue is used for burner ports and the exit flue leads out into the chimney. The exit and entrance flues are directly across from one another and must be equal in their respective total square inches, because what comes in must go out. The math for this was relatively simple however we struggled with material sizes. The sizes must be equal to assure an even temperature throughout the kiln. The entrance flue also referred to as burner ports consists of four smaller openings and the exit flue has two larger ones. We also had to leave small openings along the back wall to be used during firing for the introduction of the soda mixture.

Following the main body we constructed the chimney. The chimney must be at least one and a half times the height of the interior dimension of the kiln. The interior height of the kiln is four feet so we decided on an eight-foot chimney. The larger ratio was intentional to create more draw of flame horizontally across the interior of the kiln. The chimney also must taper down in internal dimension from the bottom to the top. The interior dimension at the bottom of the chimney started at about twelve inches by fourteen inches and it tapered down to eight inches square at the very top. Considerations for dampers at the exit flue site were taken and kiln shelves were used to slide in and out in between the chimney and kiln wall. We also added a set of passive dampers on the outside of the chimney about half way up for additional control when creating a heavy reduction atmosphere. Passive dampers are a way of creating a more subtle atmospheric adjustment.

Our next step was the construction of a removable wooden arch mold to be placed on top of the walls to work as a temporary support while we installed the arched hard bricks. The mold stops the bricks from falling inside the kiln before the key brick is placed in each row of arch brick. After the arch bricks are all placed and the mortar is allowed to harden for a few hours the mold is then removed.

We now had to build a permanent steel support structure outside of the kiln to support the arch as well as provide...
stability during firing. A kiln expands and contracts due to temperature changes during the firing process and the support structure must take that into consideration.

We chose to use a steel support system that we cut to size and welded together, then attached to the concrete slab. Before continuing we started a small fire inside the kiln in order to promote the setting of the mortar in the arch bricks. After the steel angle iron support structure was installed we then moved onto the back and front walls that enclose the arch. When constructing the front walls there were several considerations to account for: both the back and front walls need to have small openings to allow the soda mixture to be introduced into the atmosphere during firing. The front wall needs to have a large opening to work as a door for loading and unloading work. The front wall door was bricked up before firing and after loading ceramic works.

Our next project was the bag-wall design and insulation. The bag-wall is located in the interior of the kiln and is designed to control the flow of the flame and prevent works from direct flame exposure. The bag-wall is located about one foot from the burner flames. When the flame hits the wall it is directed upwards and along the arch, the flame swirls inside the main chamber and then out the chimney flue. This simple wall is an interical part in controlling all aspects of the kiln's internal atmosphere.

The final step in the kiln construction was the installation of kaowool and finally the castable mortar to cover the arch. First we measured and cut the kaowool to fit the arch. Kaowool is a fire retardant fiber used to insulate the arch instead of using a layer of soft brick. Next we cut and laid chicken wire over the kaowool to allow the castable mortar a surface to adhere to. Lastly we mixed the mortar and spread it over the wire to form an adobe like roof and for even further insulation. We specifically chose this technique to contain as much heat inside the kiln during firing as possible. This design also allows for almost no heat to leak out from the arch. The mortar used is designed to set at high temperatures and would not fully cure until the firing. So once again a small fire was started inside the kiln and the venterian burners were used directly on the mortar to set.

The design and construction of the kiln lasted about five weeks. During the construction I was also working in the ceramics studio to produce work to fire, and researching glaze recipes designed for soda firing. At the same time we ordered materials for the kiln and also ordered clay to be used for my personal works. After much debate over which clay body to work with I decided on a porcelain clay body and subsequently ordered one thousand pounds of porcelain. The adjustment to this new material proved difficult, to say the least. Porcelain, unlike a regular clay body, does not contain grog. Grog is basically sand and it gives clay its stability. Porcelain is also very soft, having the consistency of cream cheese. A porcelain body is also very sensitive, allowing very little room for error when in the wet stage as well as when adding pieces onto wheel thrown works. As a
result of this unforeseen set back I was forced to start over in
my wheel throwing, to relearn in a new material. Instead of
starting with the sketchbook full of new ideas I began with
simple forms and worked my way up in both form difficulty
and size. Despite my struggle I still produced a considerable
amount of work for the first firing. My forms include cups,
bowls, pitchers, vases, and other larger forms. The next step
towards the firing was a bisque fire of my completed green
ware to prepare it for glazing.

During the construction of the kiln I also was research­
ing glazes in books, magazines, and on the internet for glazes
conducive to a soda fire kiln. I chose four glazes for the first
firing to test: two slip glazes, one matt glaze, and one gloss
glaze. I chose several glaze finishes in order to test the effect
the soda mixture has on there finished texture. A slip glaze
consists of primarily a powdered clay body and produces
a matt finish that is very susceptible to flashing in a soda
kiln. Flashing is when extreme temperatures cause a burst
of color on one or more sections of the piece. A matt finish
glaze usually has a consistent matt finish only interrupted
with a textual effect caused by a build up of the soda mixture
when firing. A glossy glaze will produce a glass like finish
when fired. I then applied the newly mixed glazes to the
work along with several studio glazes. The studio glazes have
been proven successful in oxidation as well as reduction at­
mospheres, however not in a soda kiln. After preparing the
work for the kiln we were ready to load and fired the kiln.

Before we loaded the kiln we prepared cone packs to
place in several places inside the kiln to be used as a tem­
perature gage as well as check to see how evenly heat was
being distributed at different levels as well as the front and
back of the kiln. The cones are designed to melt at certain
temperatures as a fail-safe or a back up for a malfunctioning
pyrometer. Loading the kiln went smoothly and we managed
to fit all of our pieces in and then we bricked up the door, and
left the kiln and its contents to sit overnight before starting
the firing in the morning.

The morning of the firing we received news of rain and
we quickly built a temporary shelter for the kiln to keep it,
its contents, and the forced air burners dry during the fir­
ing. We lit the burners at seven am. At around four am we
realized we would soon drain our two one hundred gallon
propane tanks and had to refill them. We refilled the tanks
with no problems and continued firing until two-thirty the
next morning, until we ran out of fuel. We were then forced
to introduce the liquid soda compound into the kiln before
the desired temperature was reached.

Not reaching temperature in our first firing was not a
shock. However it was disappointing for two reasons. Be­
cause the kiln did not reaching temperature, the glazes did not reach maturity and I was unable to determine their success. They were subsequently ruined. Because we did not expect to fire off properly the first time and we knew adjustments would have to be made we were prepared for this result.

We determined from the firing that several things went wrong, however they are easily adjusted. We know that the bag wall design was an issue. When we place the bag wall originally we had planned to use four venturian burners and later changed to using a more effective forced air burner system, which only required two of the four burner ports. As a result the forced air burners lined up with openings in the bag wall and subsequently the wall's desired effect of pushing the flame up and over the wall failed. This would not have happened if we had used our original burner system. We believe due to the volume of air being forced out the chimney by the forced air burners that the interior of the kiln was too much heat. This problem is also easily solved with the installation of dimming switches in both forced air burners to give us a greater control of the air output in the kiln.

This research opportunity has allowed for personal growth in my chosen craft of ceramics as well as a tremendous learning experience. It was my goal in this research project to learn as much about kiln building as possible as well as work on my portfolio, which I will be using to apply to several graduate degree programs. Knowing that my own personal goal is to become a college professor of ceramics this project has giving me many of the tools I will need in the future to achieve this goal. This research project also taught me how to struggle; I learned how to have the discipline to reach my academic, professional and artistic goals. The results of this research will be shared with both my peers as well as professionals in the field of ceramics. My findings will allow others to learn and grow from my experiences as well as gain inspiration and encourage similar research projects.

Future Plans

I will be continuing my research into the fall and spring semesters. During this next academic year I will continue the production of quality ceramic works as well as glaze experimentation and testing through the firing of the soda kiln. We plan to fire the kiln several times depending on how quickly we have enough work to fill the kiln.

I will also be applying to several graduate programs utilizing work created during this research project as well as work produced during the next academic year. My portfolio also will be greatly improved from the use of this specialized firing technique through the soda kiln. After graduate school I will apply for teaching positions on the collegiate level.

Acknowledgements

I would like to thank Derek Hambly for being my partner in crime and friend this summer and for his faith in me when I had lost it. I would like to thank my professor, mentor, and friend Preston Saunders for his encouragement, support, and wisdom, for letting me order one thousand pounds of porcelain and for always pushing me a little harder than I would like to be pushed. I would like to thank mentor and professor, Rob Lorenson for always coming when we called and being my voice of reason when I panicked. I would like to thank my mother for being my friend, for her unwavering support, and for not killing me when I occasionally tracked mortar into the house.
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St. Earth Pottery
Exploring the Traditions of
the Zen Praying Process

By Donald Serra

[Text continues on the right side of the page]
Exploring the Tradition of the Soda Firing Process

BY DEREK T. HAMBLY

Abstract
The body of research I have conducted is centered on developing two focuses in the discipline of ceramics. The first is to design and construct a gas-fired cross-draft soda kiln in which to fire ceramic works. The second focus was to experiment with glaze formulas that are complemented by the soda fire process. With both focuses fully researched I will strengthen a fundamental understanding of this creative process as a whole.

This research is beneficial in promoting growth on an individual level as an aspiring ceramic artist as well as providing valuable documentation to all others in the discipline whether they are students or professionals. As it is my intention to teach ceramics at the collegiate level this body of work is truly a giant stepping-stone in becoming a complete and competent ceramic artist.

INTRODUCTION
The body of research that I have conducted this summer was focused on developing and strengthening my background within the discipline of ceramics. One aspect of this research was to design and construct a reduction atmosphere kiln. In terms of the many kiln designs and firing styles that now exist within the field of ceramics I wanted to explore something that I had not been exposed to during my studies at Bridgewater State College. The firing process I decided to investigate was that of the tradition of soda firing. This specialized firing process was chosen in order to broaden my exposure to the many variable aesthetic qualities this style of firing can achieve. The specific design of the kiln as well as the fuel source for the firing process was a major consideration and a great opportunity to delve into new realms of the discipline.

The kiln design itself is primarily known as a barrel-top cross-draft kiln. The
fuel source that was chosen for firing the kiln was propane. Previously I had the opportunity to work on designing and construction of a downdraft wood-fired kiln. This new design and fuel source allowed me to explore many new aspects of kiln engineering. Another aspect of my research was to continue to explore and produce new forms of ceramic works using the wheel as my primary tool for production. This allowed me to produce works to experiment with when firing the kiln. I was able to use these works for the use of experimentation of glaze formulations that are conducive to the soda firing process.

This was also a great opportunity in that it allowed me to collaborate with a fellow potter, Kristina Stafford. The choice of design and kiln construction was an overlapping aspect of our proposals and was a challenging endeavor for both of us. In order for us to reach the other aspects of our individual research we needed to complete the kiln construction in a timely and efficient manner, and this was achieved. Exploring these ideas of research has allowed me to strengthen my understanding of the creative process of ceramics as a whole as well as establishing a sense of community within my work habits. The following is a documentation of the significance, methodology, and results of researching these ideas in the craft of ceramics.

SIGNIFICANCE & METHODOLOGY

On a personal level this research was most beneficial in that it allowed me to again be reacquainted with the experience of working as a researching artist. It is not to say that this is not the scenario while conducting my studies through the course of a semester, but rather that my attention is focused to my one passion in ceramics while researching. This allows for many other beneficial opportunities in that I can work day to day with no other commitments but to that of my craft.

This research is primarily a hands-on process of discovery through the act of creation while examining fundamental, specialized, and traditional processes of creating ceramic art. This research is also a valuable tool in that it provides a documented body of work to further educate those in the discipline, as well as others, and will provide new exposure to those not acquainted with ceramics.

This body of research in regards to my intentions of becoming an educator within the discipline of ceramics at the collegiate level, influences many aspects of my craft. As artists and educators within the arts are one in the same, the value of our work lies within the contribution to the community as a whole. Every work holds a lesson, a problem resolved, a statement, or nothing at all. The undeniable truth is that the act of creation and the product of that act both are educating tools.

Having again the opportunity to do both on an individual level has allowed me to explore a more personal side to my work. Every artist has what is referred to as a “voice.” Finding this on the other hand is the challenge, and this research has granted me the freedom to experiment with my work as well as refining my craftsmanship within the skills I already possess. Exploring these ideas in terms of creating works was much more comfortable this time around. Because I had already come to terms with maintaining a clean and safe working environment in the studio as well as properly managing my time, I had much more time to create work. In regards to the designing and construction of the kiln, Kristina and I were able to finish the building of the kiln because of my previous kiln experience. In addition, our mentors allowed us to move towards our goal with great efficiency.
Designing and constructing the kiln was a very calculated process that involved many considerations. The first concern was that of the type of kiln to be built. We all agreed that a smaller kiln than the previous one that I had built would be sufficient. The kiln would be used during the semester by more advanced ceramicist and thus encompassed a smaller community of artists not requiring a larger modeled kiln. This would also allow for more frequent firings due to a smaller stacking space for works. The style we chose was that of a barrel-top cross-draft kiln. We also chose the primary fuel source as a propane-burning kiln that would be specialized by the treatment of a soda compound in order to explore the aesthetic qualities of this traditional firing. This traditional firing style is a primary focus in my research. I will have the opportunity to explore many textural aesthetics in regards to glazing treatment.

Once these choices had been made the construction of the kiln was started. The first thing we had to do was lay a solid concrete slab reinforced with rebar as a foundation for the refractory bricks used for the kiln. This foundation is necessary to protect the kiln yards floor structure from heat damage as well as insulation for the kiln floor.

Once the foundation had cured the kiln floor was laid. The bricks that were used for the kilns construction are specifically fabricated for kiln building in that refractory material used to make the bricks are rated for the temperatures we require for our firings. These temperatures exceed over twenty three hundred degrees and the bricks have a life expectancy of up to twenty years. The bricks were sealed with a self-hardening mortar mix that cures for a tighter insulation during the first firing.

We also had the opportunity to order custom cut bricks for specific areas of design in the kiln such as the barrel-top arch and flue openings as well as the bag wall. The floor of the kiln was laid in two layers. The first was a layer of soft insulation brick and the second was custom cut hard bricks that provided the template for the walls of the kiln.

The next aspect of construction incorporated mapping out the door of the kiln, the burner port flues, and the exit flues to the chimney. In the same manner as the floor these aspects of the construction where done with the interior layer...
was laid with hard bricks and the exterior was laid with soft insulation bricks. These specific aspects of the kiln's design needed a great deal of attention in regards to providing stability for the kiln's arch roof and for proper spacing for the flue ports, spy holes, and spray ports. Careful attention was also paid to the burner port opening size in relation to the exit flue size as to not choke the flow of the flame. Simply put, what goes in must come out.

Once the walls were built the arch roof was laid down. In order to provide stability for the arch while the mortar hardened and sealed, a removable plywood frame was constructed. With the frame still in place we provided further stability for the kiln by building an angle iron frame that was welded and bolted to the cement foundation. This was built in order to compensate for the expansion and shrinkage of the bricks during the firing process. After the arch bricks were laid and had cured the temporary plywood frame was removed and a large fire was built in the interior of the kiln as to speed the mortar's drying process.

After the arch was completed and support was achieved for the kiln the front and back walls were laid. Spy holes and spray ports were mapped out as well as building the kiln's bag wall in the interior. The bag wall is used to direct the flame from the burners into the radius of the arch thus creating a crossing draft. The bag wall is built free standing with no mortar out of hard bricks that were custom cut for this design aspect.

The next step was the construction of the chimney. This was the simplest task of the construction of the kiln. We calculated the size of the opening of the chimney and its height and tapering and laid it down with just hard bricks and three damper systems to control the kiln's atmosphere. These dampers allowed us to change the kiln's atmosphere from an oxidation to reduction atmosphere with ease and thus allowed precise kiln control.

The final stage of the kiln's construction was to put down a castable mortar roof that is insulated with a Kaowool blanket that is laid over the arch brick. The fiber blanket is fire retardant material used as insulator to maximize the containment of heat in the kiln. This aspect of the design allows for a stronger insulation of the heat produced thus being cost and time efficient. The castable mortar was reinforced with wire mesh fencing and then cured with venturian burners that heated and sealed the mortar mix. We also lit another small fire in the kiln to dry the mortar out at both ends, and this brought the kiln's construction to an end.
Over the course of five weeks we designed and built the kiln and spent time in the studio producing work and preparing a few glaze recipes to run in the preliminary test firing. During this time in the studio I concentrated on mastering ceramic forms I had previously studied. This allowed me to establish a refinement in the technical aspects of creating these forms. These forms were made using the wheel thrown process and were done with several different stoneware bodies that are conducive to reduction firings.

The test firing began at around seven in the morning and finished around two thirty the following morning. All of the ceramic ware was loaded the day before. During the course of the firing we experimented with controlling the kiln's atmosphere with the damper systems while recording the burning of fuel amounts in comparison to the increases in temperature. Control was established throughout the kiln firing and a true reduction atmosphere was achieved. In light of all of the successes the desired temperature was never achieved. This was a disappointing aspect in that the works that we had created were ultimately destroyed and the glazes we used never matured due to the lack of temperature. On the other hand when opening the kiln, after a full day of cooling, we were able to see two primary faults in our design that are adjustable.

The first mistake we had made is that the forced air burner systems were too strong in relation to airflow. We documented that much of our heat was being forced out of the chimney as well as impeding our rate of combustion to create heat. This will easily be managed by incorporating a dimmer switch on the burner systems to slow the flow of air into the kiln. Secondly, the bag wall had spacers in the bottom course of bricks that were aligned directly in the path of the burner ports ultimately allowing the flame to barely cycle through the kiln but instead travel across the floor directly out of the chimney. This issue can easily be remedied by redesigning the bag wall and should only take an hour or so. The dimmer system is something that is being investigated at the moment and should be resolved once the parts come in. Both of these factors caused severe heat loss.
and a lot of wasted money in fuel expenses. The one major positive factor in spite of all this is that the temperature that was achieved was very close to our desired one. With this in mind these two minor adjustments should resolve these issues.

These past ten weeks has allowed me to grow my interest and develop understanding of my craft and my capabilities within it. I have had the opportunity to spend time freely as a researching ceramicist with only the responsibility to myself to focus and explore. I have strengthened my background in tradition, fundamental mechanics and processes, and ideals of community. I have also refined my overall craftsmanship in relation to wheel thrown ceramics as well as my understanding of kiln engineering and construction.

FUTURE WORK

It is my intention to take the next two semesters and further develop my understanding of both kilns that I have the opportunity to work with. I will use these specialized firing processes to develop my graduate portfolio work as well as to prepare for possible gallery showings. I will also continue to experiment with other firing techniques in workshops around the New England area as well as with my fellow potters. I also intend to continue to develop a series of glaze formulas that are complemented by both firing styles that I have investigated over the past two summers. This will enhance the quality of my portfolio work.

ACKNOWLEDGMENTS

I would like to express the deepest of gratitude to my friends and mentors, Rob Lorenson and Preston Saunders. Thank you for your trust and confidence in me for the second time. I would not be at this point and this eager if it was not for all that both of you have taught and shared with me. To Kristina, my fellow potter, thank you for sharing this opportunity with me. You are a wonderful potter and dear friend and remember, it takes two to Tango. To all my family and friends for understanding why I disappeared for ten weeks again. To the rest of the Art Department, thanks for always being there, no matter the situation. To the one who said "I'm not worried about you, not one bit," thank you for everything.

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Microstructural Analysis of a Drill Core from the Rhode Island Formation: Upper 750 Feet

BY ASHLEE KIRKWOOD

Abstract

The Narragansett Basin located in eastern Massachusetts is characterized by a thick sequence of Pennsylvanian-age clastic sediment. Following deposition, the basin experienced several phases of deformation during the Late Paleozoic Alleghanian Orogeny. This study investigated the upper portion of a 1500 foot drill core from Somerset, Massachusetts. The core is characterized by an alternating sequence of organic-rich siltstones and sandstones with subordinate amounts of conglomerate and coal. Microstructural analysis reveals these rocks experienced low grade metamorphism and deformation dominated by pressure solution. Evidence for pressure solution is preserved as dissolved microfold limbs and formation of crenulation cleavage. Quartz typically displays sutured grain boundaries and undulose extinction suggestive of crystal plastic deformation, which indicates temperatures in excess of 350°C. The lack of higher temperature microtextures and the low grade mineral assemblages indicates temperatures did not exceed ~450°C.

Introduction

The Narragansett Basin represents a Late Paleozoic graben that formed within the Avalon Terrane during active faulting ~320 million years ago (Mosher, 1983). As the basin developed, erosion of surrounding mountains resulted in the accumulation of over 15,000 feet of sedimentary rock. The most extensive unit within the Narragansett Basin is the Rhode Island Formation. It consists of over 10,000 feet of interlayered sandstone and conglomerate with minor shale and trace amounts of coal (Skehan, 2001; Robbins, 2005; Craig 2005). Following deposition, the basin experienced several phases of intense deformation and metamorphism related to the collision of Africa and North America approximately 280 Ma (Winstch et al., 1992).
Although much is known about the surface geology of the Narragansett Basin in Rhode Island, little work has been done in the subsurface, especially in eastern Massachusetts. This project documents the microstructures and deformation mechanisms that affected rocks found in a drill core from Somerset, MA. The role of pressure solution is more prevalent in these rocks than previously recognized.

This study investigated the effects of deformation associated with the Alleghanian Orogeny on the various lithologies within the Somerset drill core. Documenting the mineralogy and microstructures provides information on the mechanisms that operated during deformation and allows us to infer the temperature-pressure conditions during this tectonic event. This project concentrated on the upper ~750 feet of drill core (total depth of core was ~1500 feet). A companion paper by Elizabeth Connell, investigated the lower ~750 feet of the Somerset drill core.

Results

The project began with an examination and lithologic analysis of the core (Figure 1), followed by the preparation of more than 30 rock samples from various depths for petrographic analysis. Once cut, samples were sent to a commercial thin section preparation laboratory.

Lithologic Analysis

The rock sequence contained within the upper half of the core is predominately siltstone. Lesser amounts of sandstone and coal are present in equal proportions throughout the core and small veins of quartz were encountered at a depth of ~350 feet, which cross-cuts the sedimentary layering. Small pyrite grains are visible on portions of the darker organic-rich coal. Some mesoscopic deformation is visible in the core, in the form of folds.

Petrographic Analysis

Matrix minerals in all samples from the Somerset core are extremely well sorted and well rounded. Sandstone is differentiated from siltstone and coal samples due to the size of matrix grains, as well as the overall color of the sample (Figure 3). Most samples consist primarily of elongated quartz grains and aligned platy minerals, such as muscovite and biotite (Figure 3). Varying amounts of pyrite are commonly found throughout the core, with grains predominately larger than the surrounding matrix. Numerous samples contain calcite and quartz as either interstitial grains or cross-cutting veins. These veins are oriented at high angles to the lithologic layering.

Samples that contain large amounts of organic matter appear less competent and exhibit more intense deformation with the formation of a well-developed crenulation cleavage (Figure 4). At a depth of ~550 feet, a subordinate amount of chlorite is observed, usually in small veins adjacent to quartz layers (Figure 5). Crenulation cleavage and distinct folding of layers is common within rocks of the drill core (Figures 2, 4 and 5). Some samples contained large amounts of calcite that were significant in size (Figure 6). Below ~250 feet, dissolution of microfold limbs becomes more prominent. Quartz that occurs in veins displays fibrous elongation, which is growth controlled (Figure 7). It also displays slight undulose extinction, suggestive that the grains were not affected by any post-formation deformation.

Overall, there appears to be a correlation between deformation intensity and lithology. Lithologies that contain greater amounts of organic matter display more pronounced deformation features such as folds and cleavage development, whereas quartz-rich sandstone lithologies do not. The intensity change observed is probably in response to lithologic contrasts, and not related to increasing or decreasing stresses affecting these rocks.
Summary

In some samples the opaque minerals appear to have formed after deformation, as there is no preferred orientation, compared to the surrounding matrix. Other samples contain opaque grains which do have an orientation, typically parallel to the elongated quartz and muscovite, which suggests they are pre-to-syn deformational. Rocks that are rich in organic material display more intense deformation due to a lower mechanical competency. Deformation intensity does not correlate with depth, because different lithologies alternate throughout the core. Thus, we conclude that deformation in these rock samples reflects a lithologic control.

Quartz that occurs in veins shows undulose extinction, so we conclude that quartz precipitated while the rocks were subjected to elevated temperatures to cause the slight crystal-plastic deformation in the quartz. A significant amount of chlorite within these rocks suggests low-grade metamorphism perhaps attaining lower greenschist-facies conditions. Due to the type and amount of deformation observed, it can be concluded that during metamorphism, the rocks in the upper half of the core experienced temperatures between 350°C – 450°C.

On the basis of the mineral assemblage and microstructures present, rocks of the Narragansett Basin experienced a phase of intense deformation during compression tectonism associated with the Alleghanian Orogeny. This episode resulted in the development of a crenulation cleavage, microfolds, and minor crystal-plastic deformation in quartz. Rocks were deformed predominately by a pressure solution mechanism with material dissolved and re-precipitated elsewhere. Following this compressional event, the Narragansett Basin was subjected to two phases of extensional deformation. Rocks were brittlely deformed and fractures opened, which allowed hydrothermal fluids to infiltrate through the rocks. These veins represent a younger episode and may be associated with the breakup of Pangea in the Mesozoic.

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I would also like to thank Dr. Krol, not just for extensive guidance during this project, but for his continued efforts to help me through the sometimes troubled waters of earth science, and life.
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Figure 1. Generalized Stratigraphic Column of the Somerset Drill Core.

Figure 2. Visible layering with well-developed slaty cleavage.

Figure 3. Elongation of quartz grains that defines the foliation; alignment of muscovite.
Figure 4. Visible deformation of quartz and chlorite rich layer. Black matter is organic.

Figure 5. Folded quartz layer; note lack of significant crystal grain deformation indicative of temperatures < 350°C.

Figure 6. Large interstitial calcite grains with quartz.

Figure 7. Tensional stress preserved in two generations of quartz veins (gypsum plate). Note the fibrous habit of quartz grains in veins.
Development of Dirhodium Sugar-Substituted Carboxylate and Acetamide Complexes and Evaluation of their Potential as Lectin Inhibitors

BY BETHANY MASTEN

Abstract:

Current interest at the interface of biology and chemistry is the development of molecular and polymeric species that can function as scaffolding for pendant sugar groups. Such materials have the ability to affect biological phenomena including lectin-based cellular binding. Compounds that can inhibit this binding have the potential to prevent tumor metastasis. This project involved the synthesis of dirhodium carboxylate compounds with pendant saccharide moieties, as well the development of a synthetic method to prepare sugar derivatives of dirhodium acetamides; compounds that are potential lectin inhibitors. Several methods for preparing glucuronate and N-acetyl glucosamine complexes of dirhodium (II) were examined. One pathway to the synthesis of these compounds involves reacting a Rh (III) precursor to form a Rh-Rh bond while substituted carboxylates act as supporting bridges. This pathway was investigated and prior results were found to be irreproducible. Reaction of sodium glucuronate or glucuronic acid with RhCl₃·xH₂O failed to produce any dirhodium glucuronate species possessing a Rh-Rh bond. Reactions of dirhodium tetraacetate with glucuronic acid, however, produced partially substituted species in which the dirhodium bond is maintained as evidenced by UV-visible spectroscopy. Electronic tuning of the leaving group was attempted through the use of dirhodium tetratrifluoroacetate which, when reacted with sodium glucuronate, yielded partial substitution of the trifluoroacetate groups as seen with infrared-, 'H-, and 'F- NMR- spectroscopies. A preliminary lectin-binding assay for this partially-substituted product showed no inhibitory effects. Substituted dirhodium acetamide synthesis was also attempted from N-acetyl glucosamine...
and dirhodium tetraacetate. Products characterization through infrared and $^1$HNMR spectroscopies once again failed to show conversion.

One of the more important recent developments regarding sugars occurred in the 1960's. During this time it was determined that saccharides are not confined to simple ring and chain structures, but are instead capable of complex interactions with other biomolecules and sugars.1,2 The interactions most relevant to life are those of the sugars found on the lipids and proteins on the surfaces of cells. These complexes, respectively named glycolipids and glycoproteins (for which oligosaccharides are the sugar components), play essential roles in cell-cell adhesion, recognition, inflammation, and immune defense.1,2 Further, it was found that sugars on the cellular surfaces are commonly arranged in groups, or clusters.3,4 These clusters are presented in specific arrangements, and as such are capable of binding with other sugars found in complementary arrangements. Biomimetically, artificial scaffolds are also used to present pendant sugar moieties in a desired arrangement. Multiple stabilizing structures have been designed and studied including rigid organics,5 dendrimers,6 glycoconjugates,7 and metal ions.7,10 Other studies have investigated the effects of pendant sugars, finding significant bioactivity in the form of anti-tumor, antifungal, and antibacterial actions.1,12 The glycoconjugate study, in addition, found that varying either the scaffold or the sugar substituents causes a change in the bioactivity.7 A proposed mechanism for these variations involves an alteration to the spaces between the substituent groups, sometimes referred to as "pockets". Knowing that the bioactivity of each complex can be controlled through changes to the scaffold and/or the pendant saccharide, the topological arrangements of these carbohydrate groups becomes very significant from a biological standpoint. This is because the saccharide substituents are arranged in a similar "clustered" manner to the oligosaccharides that interact with lectins (sugar-binding proteins). With the pendant sugars acting in the same fashion as the oligosaccharides, competitive binding may occur as both groups try to coordinate with the lectins. A dirhodium acetamide scaffold could present multiple arrangements of sugar substituents, and may therefore provide multiple possibilities for lectin interactions and inhibition of lectin binding.

Lectins, as previously mentioned, are proteins that bind to the end of oligosaccharides on cellular exteriors. Lectins commonly bind to more than one sugar unit at a time and as such, they are a method by which cells agglutinate, or clump together.13 The presence of multiple clusters of oligosaccharides on the surface of the cell increases the lectins' ability to bind in a multivalent manner. Any substance, therefore, that has similar carbohydrate-coordinating abilities (i.e. the ability to arrange its pendant sugars as clustered units) will be able to interact in a similar manner with the lectins, perhaps coordinating with the lectins in place of the oligosaccharides. The potential applications for this ability are numerous. Viruses and metastatic cancer cells, for example, are required to bind to the oligosaccharides on healthy cells before infecting them, so an agent that already occupies these sites has the potential to prevent infection.

Furthermore, it has been found that lectins play a role in inflammation and cell-cell signaling;1,2 in instances where this is disadvantageous to an organism, lectin-binding inhibitors would be of great potential use. The dirhodium compounds that this study investigated were likely to have the ability to act as lectin binding inhibitors, and thus had potential for the aforementioned applications. Anti-tumor activity is another characteristic of dirhodium complexes, and such activity has been suggested to increase with complexation to sugar-modified carboxylates.11,12 This finding evokes the idea that other sugar modified dirhodium complexes, such as those investigated here, may also show anti-tumor properties, though this study only looked at lectin inhibition as an indicator of such potential.
Results and Discussion

Dirhodium Carboxylate Complexes

Eq 1

Much of the initial synthetic work focused on attempting to reproduce the work of De Souza Gil, who reported a simple process for attaching sugar-substituted carboxylic acids to a rhodium(II) fragment, with promising results (Equation 1). In this reaction, the Rh(III) precursor is reduced to Rh(II) with concomitant formation of the Rh-Rh single bond. The carboxylates act as bridges, assisting with the formation of the metal-metal bond.

\[
\text{RhCl}_3 \cdot x\text{H}_2\text{O} + \text{Na}^+ \rightarrow \text{Rh}^{II} \text{comp} + \text{NaCl}
\]

Rhodium trichloride was heated with the sodium salt of glucuronic acid for 6 hours, and a slight color change was observed, from brown to greenish-brown. To separate the mixture, the reaction was run through a Sephadex G25-50 column as reported by De Souza Gil. Complete separation was, however, not observed. The solution did partially separate into a band that was more yellow/brown and another that had a green/brown color to it. However, the characteristic teal color associated with dirhodium tetracarboxylates was missing, suggesting that the synthesis was unsuccessful. A similar reaction with the RhCl₃·xH₂O complex was also attempted using glucuronic acid instead of sodium glucuronate. This resulted in no observed color change after the initial formation of the orange/brown solution, despite 24 hours of heating. Consequently, the rhodium trichloride pathway was abandoned in favor of a route in which the starting material already contained the Rh-Rh bond.

Eq 2
Earlier work has shown that many dirhodium tetracarboxylates can be prepared from dirhodium tetraacetate through ligand exchange. Dirhodium acetate was refluxed with 10 molar equivalents of glucuronic acid in a Soxhlet extractor (Equation 2).

The thimble of the extractor was loaded with CaCO₃ to neutralize the volatile acetic acid that would be produced in the reaction. A variety of solvents were explored with ethanol found to be the most promising. Refluxing the solution for 6 days resulted in a blue-teal solution. The solvent was removed under vacuum and the resulting solid was redissolved in H₂O. Elution of the aqueous solution down a Sephadex column produced two bands, one yellow-brown and the other teal in color. The teal band was allowed to slowly evaporate, yielding a highly hygroscopic teal solid. The IR spectrum showed a major absorbance at 1600 cm⁻¹ shifted from the 1580 cm⁻¹ signal found in dirhodium acetate's spectrum, and indicating some conversion. Another glucuronate in water at room temperature for 12 hours produced a green solution (Equation 3).

Removal of the water followed by repeated washings with CH₂Cl₂ ether, and acetonitrile resulted in a green solid. The IR- and NMR spectra of the resulting product were more promising than previous samples, indicating low levels of impurities and the presence of bound sugar (all free N-acetyl glucosamine should have been removed by the acetonitrile washings). The IR spectrum confirms the presence of sugars with a broad O–H absorption near 3400 cm⁻¹. The set of multiplets in the ¹H NMR between 3.10-3.68 ppm is evidence for bound glucuronate as well. The clarity of the multiplet resonances between 3.10-3.68 ppm suggests the presence of only one compound. Complete ligand exchange did not occur, however, since the presence of bound trifluoroacetate was confirmed by a ¹⁹F NMR resonance at -75.5 ppm. The relative purity of this sample, as well as the evidence for at least partial substitution, led us to select it for subsequent lectin testing (vide infra).
Dirhodium Acetamide Complexes

As with the prior glucuronic acid reactions, a Soxhlet extractor was used for the dirhodium acetamide syntheses (Equation 4). Calcium carbonate was added to the thimble to neutralize and remove from solution any evolved acetic acid. A number of solvents for the reaction were examined. Toluene and ethanol were our first choices as solvents in order to avoid dissolving the calcium acetate that would be produced as a result of using the thimble.

\[ \text{Eq 4} \]

Although the solutions eventually acquired a teal color, toluene did not initially dissolve either the dirhodium acetate or the N-acetyl glucosamine. Deionized water was by far the least successful solvent: it initially dissolved everything, leading to incomplete reactions. The initial teal solutions turned dark brown within one day of refluxing indicating decomposition of the Rh-Rh bond. When ethanol was used, the resulting solid could be dissolved in water and run down a Sephadex G25-40 column to separate teal bands from yellow/brown bands that may have resulted from some sugar decomposition. The products of the toluene reactions were not water soluble enough to allow for column chromatography, but did result in purple solutions when washed with acetonitrile. The purple washings were dried and remaining solids determined to be dirhodium acetate. Subsequent IR and \(^1\)H NMR spectra of these solids revealed that much of the extra ligand was still present, and that the initial rhodium acetate was present as well. There may have been a partial replacement of one or two of the acetates by acetamides, but the spectra shows a definite lack of complete conversion.

Lectin Inhibition Study

Despite our failure to isolate a completely substituted dirhodium glucuronate or acidamidate, we still wanted to test for lectin inhibition to investigate the properties of the partially substituted species. To this end, a simple agglutination assay was used to determine the lectin inhibiting potential of the complex formed by the reaction of dirhodium tetratrifluoroacetate with sodium glucuronate. This assay verified that the presence of the dirhodium compound did not cause a decrease in the number of red blood cells that agglutinate compared with a positive and negative control. The results of this study suggest that the dirhodium complex does not inhibit lectin binding. This was shown by a hemagglutination assay with human erythrocytes in which concanavalin A (Con A) was used as the lectin (Figure 1).
Figure 1: Light microscopy images from an Olympus BX51 microscope taken in phase mode with a 40x objective lens:

(i) Human erythrocyte suspension in buffer with no lectin present. (ii) Erythrocytes in buffer with concanavalin A (Con A) lectin showing 68% agglutination. (iii) Erythrocytes, Con A, and dirhodium complex, showing 53% agglutination. (iv) An example of lectin inhibition, caused by the presence of mannose. (v) A control containing only erythrocytes and dirhodium complex, showing a lack of agglutination.

In contrast to the 2% of cells agglutinating with both the control (only cells) and a sugar (mannose) inhibited sample, the rhodium carboxylate allowed 53% of the red blood cells to agglutinate. This clearly shows that our product did not inhibit the lectin-induced binding. This is most likely the result of incomplete complexation with the glucose-modified acetates.

Conclusion

Of the investigated methods for preparing glucuronate complexes of dirhodium, there was no success when a Rh(III) precursor was used. That pathway was therefore abandoned in favor of using a starting material that already contained the rhodium-rhodium bond: dirhodium tetracetate. Incomplete conversion, as evidenced by UV-visible-, IR-, and NMR spectroscopies, led us to use more reactive species: sodium glucuronate and dirhodium tetratrifluoroacetate. This led to partial substitution of the products, which unfortunately were found to exhibit no lectin-inhibiting properties. Although partial substitution was accomplished with the dirhodium carboxylate compounds, there was no such success with the dirhodium acetamides. Different synthetic processes will be attempted to complex the dirhodium acetamide with sugars, including reacting $\text{Rh}_2(O\text{Ac})_4$ with the molten ligands. The presence of the hydroxyl groups leads to the undesirable decomposition of the sugars upon melting. This can be circumvented by acetylation of the hydroxyl groups on the N-acetyl glucosamine, which can then be used directly in a molten reaction. Following the metal complexation, these acetyl group can then be removed by treatment with NaOMe. The protecting acetyl groups help to stabilize the compounds both thermally and chemically so that they will not decompose upon melting. Alternatively, the protected acetamides can be deprotonated and reacted with RhCl$_3$ or Rh$_2$(OAc)$_4$.

Experimental Section

General Considerations

All chemicals and solvents were purchased from commercial sources and used without further purification,
including acetonitrile, diethyl ether, ethanol, isopropyl alcohol, and toluene. All visible spectra were gathered using a Hewlett-Packard 8543 diode-array spectrophotometer. Infrared spectroscopy was performed as between sodium chloride plates in a Nujol mull. \( ^{1} \) H- NMR studies were performed on either a 400 or a 500 MHz JEOL-ECX spectrometer. \( ^{19} \) F NMR spectrum was performed on a 400 MHz JEOL-ECX spectrometer with shifts reported relative to \( CCL_{2}F_{2} \).

**Synthesis of dirhodium carboxylate complexes**

**Method 1:** The literature method reported by De Souza Gil\(^{11}\) required mixing 0.100 g (0.44 mmol) of \( \text{RhCl}(\text{CH}_{3}\text{OH})_{2} \) with 0.216 g (0.92 mmol) of the sodium glucuronate or 0.179 g (0.92 mmol) of glucuronic acid. The reactions were performed under argon on a vacuum line using Schlenk techniques. 10 mL of 50% ethanol was added resulting in an orange-brown solution in both reactions. The sodium glucuronate reaction was stirred in a 70°C water bath for 6 hours. The glucuronic acid reaction was stirred in a 70°C water bath for 24 hours. A G25-40 Sephadex column was used in to purify the sodium glucuronate solution, and was eluded with a 50% methanol solution. A yellow solution came out of the column, and a darker green band was immobilized on the column and was later pulled through with deionized water. The resulting olive green solution was put through the column again, but did not separate into discrete bands.

**Method 2:** In a Soxhlet extractor whose thimble was filled with \( \text{CaCO}_{3} \), 0.100 g \( \text{Rh}_{2}(\text{OAc})_{4} \) and 0.4371 g \( \text{N-acetyl glucosamine} \) were mixed. 10 mL of toluene was added as a solvent, and the reaction was refluxed via heating mantle for 4 days. The resulting solution was pumped down and water was added, in to which the solid did not readily dissolve. The water decantings were then pumped down and acetonitrile was used to wash the solid resulting in a purple solution. This solution was decanted and the solvent was slowly evaporated to give a purple solid that became green in the presence of moisture. Spectral properties of the solid were consistent with those of dirhodium acetate.

**Attempted synthesis of dirhodium acetamide complexes**

In a Soxhlet extractor equipped with a cellulose thimble filled with \( \text{CaCO}_{3} \), 0.100 g \( \text{Rh}_{2}(\text{OAc})_{4} \) \( \text{CH}_{3}\text{OH} \) and 0.4371 g \( \text{N-acetyl glucosamine} \) were mixed. 10 mL of toluene was added as a solvent, and the reaction was refluxed via heating mantle for 4 days. The resulting solution was pumped down and water was added, into which the solid did not readily dissolve. The water decantings were then pumped down and acetonitrile was used to wash the solid resulting in a purple solution. This solution was decanted and the solvent was slowly evaporated to give a purple solid that became green in the presence of moisture. Spectral properties of the solid were consistent with those of dirhodium acetate.

**Agglutination Assay**

The concanavalin-A (Con-A) lectin was from jack bean and used as received from a commercial source (Modern Biology). The assay was performed in a buffer solution made up of 0.15 M NaCl, 0.1 mM MnSO\(_4\), 0.1 mM CaCl\(_2\), 0.2% BSA and 10 mM tris-HCl at a pH of 6.8. Two drops of
human blood were obtained and mixed with 2 mL of buffer resulting in an erythrocyte suspension. Five samples were prepared according to the following chart:

<table>
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<tr>
<th>Tube #</th>
<th>Erythrocyte Suspension (µL)</th>
<th>Buffer (µL)</th>
<th>Con A Lectin (µL)</th>
<th>Rhodium carboxylate complex (µL)</th>
<th>Mannose (µL)</th>
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The slides were incubated at room temperature for 45 minutes with gentle mixing approximately every 10 minutes. At the conclusion, a 10 µL sample from each tube was analyzed using light microscopy images from an Olympus BX51 microscope taken in phase mode with a 40X objective lens by counting 100 erythrocytes and the number agglutinated (touching each other) for each sample. Results were: tube 1, 2%; tube 2, 68%; tube 3, 53%; tube 4, 13%; tube 5, 2%.

Works Cited

The Initial Formation of Independent Cultural Consciousness in British Colonials in the Caribbean During the Eighteenth Century Through Poetry Written by Colonials in the Caribbean

BY ADAM STILGOE

The eighteenth century found the British Empire the ruler of the seas and quickly becoming the most powerful nation in the world. Nowhere else was this more evident than its few, but growing, number of Caribbean islands. Populated by poor farmers, adventurers, and hundreds of thousands of slaves, islands such as Barbados and St. Kitts were, in the mid-1700’s, concerned with only one thing. Sugarcane was easily the most profitable crop ever to have been grown in the Caribbean by British farmers and it rapidly skyrocketed the extremely poor to the upper middle class and sometimes beyond.

But explaining how a group of people viewed themselves hundreds of years ago proves much more difficult than a simple historic overview. Why did they change, and how quickly did they come to view themselves as a separate people and not as a group of farmers who were still British, but far from home? When did a British-Caribbean identity form, and how did the process continue? These questions must be asked for us to understand the condition and mentality of the Caribbean in the modern day, but it becomes unwieldy when asked alone. Slimming of the overall line of questioning must be done, but a proper medium for answering it is difficult to find in the eighteenth century from island records such as Barbados. Fortunately, men like Samuel Keimer collected poems and records written by Barbadian inhabitants concerning what their island [in a book entitled Caribbeana], and islands similarly concerned with growing and selling...
sugar cane, were going through in the 1730s and 1740s. And Samuel Grainger, who visited St. Kitts to research the means of producing sugar, returned to Britain with a long Georgic poem concerning it. Both men, unknowingly or not, helped not only to develop our understanding of how life in the British-controlled Caribbean worked, but also brought back to Britain a much better understanding of who colonials in the Caribbean were and the sometimes horrific lifestyle they were living at the time. Grainger especially shows us his thoughts on the British-Caribbean colonists as a separate people, and justly defends their right to remain so, the first and clearest attempt by someone who had traveled to the Caribbean to do so.

Historian Jack P. Greene's essay, "Changing Identity in the British Caribbean: Barbados as a Case Study" could not be better suited for helping identify some of the problems facing the Barbadians in the eighteenth century during the time *Caribbeana* was written, and for helping explicate the problems this thesis deals with. In addition to cataloguing important events from Barbados' settlement by English colonials to its gradual literary rebirth beginning in the 1740s, Greene lays down the fundamental stages through which an English colonial society develops a sense of its own identity, with conclusions that help to shape just why *Caribbeana* was so important, although his eventual end statements are rather too sociological to be of much use to the intellectual interested in literature.

Greene lays down the foundation of building a kind of 'societal consciousness' through four independent steps generally followed by British colonies, especially in the Americas. As we shall see, and as Greene attempts to make clear, Barbados is rather anomalous with regards to the first and last steps, due in large part to its literary contributions to the English-speaking world, a fact Greene quickly glosses over.

The first step that shapes a colony's sense of independent cultural identity refers primarily to the shape and content of the new landscape where the colonials arrived to build a new life. Islands like Jamaica and the Bermudas were unique in some of their environmental characteristics, which in turn led to colonists coming to a kind of understanding of themselves through their living environment, but the development of colonial identity in Barbados began much more auspiciously. During the first years of settlement Barbadians did not define themselves as a culture almost at all; it was almost entirely created by outside sources, the first but not the last time that outsiders would attempt to mold Barbadians into a people that the colonists knew they were not. Barbados was not considered to be prime territory by the English, who sent colonists there in 1627 after the rest of the European countries had ignored it for over 125 years. There was little in the way of public recognition of the event, as it was not considered a colony of much worth, either economically or otherwise. As with Virginia several years before and the Massachusetts Bay colonies several years later, Barbados slowly filled with farmers seeking a new life, whose primary goal, that of producing enough provisions to feed themselves and to make a small profit from, was admirably acquired in the first fifteen years of its existence as a royal colony. During this time there was little in the way of a colonial or cultural consciousness. Barbadian residents were primarily the people Britain did not want in the home islands. Scots made up the primary group of 'foreigners', while many landless or poor British men and women went to Barbados simply because it was an opportunity to escape poverty. No one felt they were anything more than British locked in a hellish island existence, and consequently the development of cultural consciousness was neither necessary nor expected by anyone. It was only with the arrival of sugarcane that Barbadians truly began to find themselves.

From 1640 to 1670 the sugar trade in Barbados (and throughout the Caribbean, with the French the main rival of the British in sugarcane production) grew exponentially, bringing back to Britain tales of easily-obtained wealth and
drawing adventurers and fortune seekers from around the
English world. Although Barbados was tiny, its soil was
almost untouched and in a very short time sugar production
grew to dominate Bridgetown and every other settlement in
Barbados, right down to the individual farmsteads. Sugar
was life and death for these people, and unfortunately,
it rapidly became death. Adding on to the tremendous
difficulties and loss of life of slaves and masters working in
the fields under the hot Caribbean sun, the island's "new
rich" began purchasing luxury goods that far outweighed
their means, disrupting the island's own economy and
sending necessary goods plummeting. Very little food
other than sugarcane was grown or raised on the island and
Barbados suffered considerably as its newly rich inhabitants
bought fancy carriages but were unable to afford bread and
mutton. Due to poor farming practices and the conversion
of every available acre to sugarcane production, the fertility
of the soil was rapidly eliminated; Jamaica quickly replaced
the smaller, less-fertile Barbados in sugar production, and by
1700 Barbados was in horrific economic decline.

The formation of cultural identity, non-existent before
1640 and the adoption of sugarcane as the main export of
the island, was rapidly developed by outsiders. They did
not follow the first stage forwarded by Greene, however;
instead they created Barbados as an economic, rather than
a physical, entity, and Barbadians as sugarcane farmers, and
nothing more. While it was certainly clear in the literature
produced by writers even somewhat familiar with Barbados
that it was indeed a Caribbean island, any descriptions of
Barbados began and ended with sugarcane and the means of
its agricultural growth. Barbados' population swelled post
1640s with people eager to make a quick fortune once the
vast economic potential of sugarcane was discovered, until
in Thomas Towne's words, sugarcane became 'the soul of
Trade' for the island itself.

With the vast fortunes made by middle and lower-class
colonials in Barbados came economic difficulties as well.
Luxury items were purchased non-stop by wealthy Barbadians
eager to outdo their neighbors, and with the complete focus
on sugarcane production (both to meet export needs and the
growing 'need' for luxury goods by the upper class located on
the island) animal husbandry and the growing of necessary
food crops were badly mistreated and often overlooked. The
island's main town, Bridgetown, consisted of poorly built
wooden huts and crude stone buildings often destroyed
by rain, wind, and the unpredictable Caribbean weather.
Likewise the development of music, dramatic performances,
and publishable literature slackened during this period;
Barbados was rapidly becoming a place of few morals and
fewer laws other than fisticuffs and drunken brawling, or so
it seemed to outside observers. The idea that Barbados was
nothing more than a slovenly refuse pit of scum and villains is
perhaps an exaggeration, but Barbadians did little to alleviate
this overwhelmingly negative view of themselves in any
reasonable fashion; church services continued to be ignored
for the most part, laws passed by judges could be revoked or
reinstated at any time, and overall 'the sins of Sodom' were
thought by outsiders to have descended wholesale on the
Barbadian people.

Yet despite negative statements about the abuse of
its workforce and the quality of its inhabitants' moral and
religious actions and beliefs, Barbados did have some things
going for it in the literature back in Britain. Firstly, its large
population helped alleviate some concerns held by the
British back home; anywhere from 20,000 to 50,000 colonials
dwelt in Barbados at any given time between 1640 and 1740,
a fact that not only gave Barbados a settled character but also
made it particularly defensible; no French or Spanish fleet
captain could take Barbados without a costly, major attack,
and in the heated days of European wars over the Caribbean,
this was a very large plus in Barbados' favor.

Secondly, no one in Britain or elsewhere found Barbados
to be anything but beautiful, if only in a well-cultivated,
pastoralist sense. By 1670 Barbados was so densely populated
and so devoted to sugar production that the entire 106,000 acres was either cultivated or inhabited, which also lent a more positive aspect to the island in the minds of intellectuals back home. Although this meant that adventure and fortune-seekers could no longer expect to travel to Barbados to ‘strike it rich’ it did bring Barbados to Greene’s second step of forming a cultural colonial identity; that of colonists defining themselves by how they organized their social and cultural landscapes and how those landscapes did or did not conform to how such landscapes should be. By creating a kind of ‘garden isle’ Barbados lost its natural beauty and gained cultivated, and therefore (by British standards) improved beauty instead. Combining a fully formed parish system and improving its standard of living as best it could, Barbadians up to 1700 began to improve the world’s view of them slowly but steadily. Unfortunately, this was not to last.

Barbadians suffered numerous setbacks to their development of a positive cultural identity from around 1680 to 1730. The exhaustion of their beautiful island’s soil disintegrated that positive facet: in light of the decline of the soil, the island’s economy suffered as well, bringing about a mass exodus of colonials to other, newer British colonies. Jamaica continued to outperform the sugar-growers of Barbados as well. Coupled with a major epidemic of yellow fever just before the turn of the century, Barbados lost a good deal of its population and therefore its ‘settled’ look, a major factor in garnering a positive image back home. The threat and arrival of devastating hurricanes and further outbreaks of disease ground down the settler’s images of themselves, as did a long string of corrupt governors placed in Barbados by an unwary or uncaring Britain. Out only to make a profit, these governors, with a few exceptions, were corrupt, dishonest, and completely uninterested in improving the Barbadian way of life, be it through development of infrastructure or the island’s cultural mores. Parliament’s imposition of a new set of duties on sugarcane production came at exactly the wrong time for Barbados, and plunged its economy into recession. While Barbados complained, the British government did nothing to alleviate this island that, to its officials, was nothing more than a means of garnering revenue. In the eyes of Europe, and especially Britain, Barbadians were not a separate culture, but rather ‘commanded as subjects, and...crushed as aliens’ in the words of Edward Littleton. Barbadians rapidly became a subpar society, not fully citizens in British eyes and seemingly unable to break free of this stigma. The normal means available to the public at large (as the governors were almost completely indifferent) might have rested in defending themselves through intellectual means: poetry, plays, or other forms of literary expression would present a unique and innovative intellectual front. What common cultural identity there was failed to meet this challenge, burdened through the ever-present stigma from the homeland, the danger of living in such a climate, and the overwhelming sense of being inferiority.

Grainger makes mention of slavery in a different light than usual, although he is not alone among poets of his time in his viewpoints. He reminds his readers that “Howe’er insensate some may deem their slaves, Nor bove the bestial rank; far other thoughts the muse, soft daughter of humanity! Will ever entertain. – The Ethiop knows, the Ethiop feels, when trealed like a man; Nor grudges, should necessity compel, By day, by night, to labour for his lord.” Grainger then goes on to make a very interesting point that shows he has learned more in the Caribbean than the first parts of his poem let on. He muses,

“Yet, planter let humanity prevail. –
Perhaps thy Negro, in his native land
Possest large fertile plains, and slaves, and herds:
Perhaps, whene’er he deign’d to walk abroad,
The richest silks, from where the Indus rolls,
His limbs invested in their gorgeous pleats:
Perhaps he wails his wife, his children, left
To struggle with adversity: Perhaps
Fortune, in battle for his country fought,
Gave him a captive to his deadliest foe;
Perhaps, incautious, in his native fields,
(On pleasurable scenes his mind intent)
All as he wandered; from the neighbouring grove,
Fell ambush drag'd him to the hated main. –
Were they even sold for crimes; ye polish'd, say!
Ye, to whom Learning opes her ampest page!
Ye, whom the knowledge of a living God
Should lead to virtue! Are ye free from crimes?
Ah pity, then, these uninstructed swains;
And still let mercy soften the decrees
Of rigid justice, with her lenient hand.
Oh, did the tender muse possess the power;
Which monarchs have, and monarchs oft abuse:
'Twould be the fond ambition of her soul,
To quell tyrannic sway; knock off the chains
Of heart-debasing slavery; give to man,
Of every colour and every clime,
Freedom, which stamps him image of his God,
Then laws, Oppression's scourge, fair Virtue's prop,
Offspring of Wisdom! Should impartial reign,
To knit the whole in well-accorded strife:
Servants, not slaves; of choice, and not compell'd;
The Blacks should cultivate the Cane-land isles.

Grainger's information about the practice of slavery here is quite extensive. He is aware not only of other Africans’ methods of finding slaves to sell to Europeans but even considers aloud the past lives of these Africans reduced to endless toil in the fields of sugar cane. “Above the bestial rank” indeed, perhaps; but what prevents Sugar Cane from being a simple economic handbook, and slaves from being just a gear in Grainger's ingenio?

His words are outspoken and direct, putting British and fellow colonials in a compromising position. Grainger, like Virgil, spends no time dodging around the point here, although guilty of such practice in his first three books at times. Those who ignore his words are going against his muse (and therefore against the higher laws of the universe) and have, in a sense, gone against the Biblical saying, ‘If your slate is clean, then you may throw stones” suggesting that they may have acquired a slave sold to them via improper means. It gives slaves not only a background life (something rarely considered by British subjects then) but also something of a questionable social status; their slave could have been noble or wealthy or both. This is coupled with the idea of what many assumed to be a kind of animal “wail his wife, his children, left to struggle with adversity,” giving the African slave compassion and devotion to the “civilized” idea of marriage as an unbreakable bond. Grainger also moves that the slave’s capture might not have been on the field of combat, and therefore quasi-legitimate due to its correlation with ancient Roman practices, but was, “Perhaps, incautious, in his native fields, (On pleasurable scenes his mind intent) All as he wandered; from the neighbouring grove, Fell ambush drag'd him to the hated main. – Were they even sold for crimes; ye polish'd, say!” The idea of a slave kidnapped from an African eden both beautiful and pleasurable by an ambushing pack of thieves only to be taken to the ocean and sold to white slavers for no reason other than the economy of the action is repulsive to anyone, and has to make the eighteenth century reader stop and think, at least. The word “polish'd” here is sarcastic and meant to offend. Grainger’s knowledge of how the slave trade works allows him to blame Europeans for expanding the slave trade to worldwide proportions to devastating effect.

Following this preliminary accusation Grainger attacks Europeans full-force, telling them that as Christians and technologically advanced people they should therefore be intelligent and virtuous; saying, “are ye free from crimes” cannot have a positive or affirmative answer for Europeans, as Grainger presents them. The lines, “Ah pity, then, these
uninstructed swains;/ And still let mercy soften the decrees
Of rigid justice, with her lenient hand," offer an insight
into what Grainger thought; his audience does not need to
answer his question about their accountability, because their
actions have already spoken for them. He tells his audience
to pity the slaves because Europeans, as masters, have a
responsibility both to instruct and be merciful.

This leads to an interesting situation in Grainger's writing
about slavery. The remainder of this section is quite clearly
anti-slavery:

Oh, did the tender muse possess the power;
Which monarchs have, and monarchs oft abuse:
"Twould be the fond ambition of her soul,
To quell tyrannic sway; knock off the chains
Of heart-debasing slavery; give to man,
Of every colour and every clime,
Freedom, which stamps him image of his God,
Then laws, Oppression's scourge, fair Virtue's prop,
Offspring of Wisdom! Should impartial reign,
To knit the whole in well-accorded strife:
Servants, not slaves; of choice, and not compell'd;
The Blacks should cultivate the Cane-land isles.

As an avatar of Grainger's thought, his muse's wish
to abolish slavery in all its forms - "give to man, of every
colour and every clime, Freedom" - is obviously his own.
But the word "monarch" seems strangely out of place here.
Every man is not a king, and certainly few farmers with one
or two slaves felt themselves to be one, although in effect
a slave had no rights against his master no matter who he
was. Nevertheless the word is a strange one, especially in
a time of royal divinity. Grainger suggests a monarch in
Wisdom, rather than a human one, to enact laws enabling
blacks (and, strangely, whites) to come to the Caribbean
freely to settle as servants and, "not compell'd", nevertheless
work for their white master. Although this quote can be
seen as an attempt to justify slavery on moral grounds,
previous lines have shown that this is not Grainger's intent.
He despises slavery enough to attack his fellow Europeans
over its prevalence and use, so he cannot be justifying it
here. I propose that, because Grainger knows he cannot
abolish slavery, he suggests a kind of "first step" towards
fixing the problem by making Africans servants, who even
then had the opportunity to advance their station and lot
in life through hard work and diligence. Certainly it is not
the same as freeing all slaves in the world, but it would have
been a good start; most importantly, it shows that Grainger
has not yet descended into fanciful longing as many poets
do, but is keeping his Georgic instructional even in the face
of philosophical dissent.

Yet even this particularly liberal view of slavery is not
Grainger's main topic of discussion here. The second half
of the above excerpt can be read out of context with slavery,
whereupon it acquires a very different, and to Grainger
a very dangerous meaning. As previously mentioned, the
men and women on the sugar cane islands had a very short
life expectancy no matter who they were or what they did;
and as many British subjects and bureaucracy members
assumed, these "sub-par British citizens" were only good
for one thing - growing sugarcane. British colonials were
of course furious with this representation, and while they
sought to change it via political means, Grainger takes a very
potent step here by disseminating this anger throughout the
British isles through poetry. Taken in context, it appears that
Grainger is bemoaning the condition of slaves in the British
Caribbean colonies in the excerpt above. But beginning
with the line, "Are ye free from crimes?" the rest of the
excerpt can be, and should be, seen as a defense not only of
African slaves but of the near-slavery suffered by Caribbean
colonials. Grainger's muse would destroy tyrannic power,
'so oft abused' by granting 'to man / of every colour and
every clime, Freedom' - freedom from abuse, freedom
from a deadly work environment designed solely to support
the British empire, and freedom from political hexes that infringed on the quality of life on the island. Grainger not only feels that blacks should be treated better as a general rule in the Caribbean but also that they "should cultivate the Cane-land isles," a clear indication that slaves, and not British farmers, should be living and dying for the sugarcane the British empire was so dependent upon. Although he does not immediately offer a rejoinder to this (instead touching upon the subject of removing tapeworms from slaves) the final stanza of his poem, does, with an even more profound moment of separation of interest – the poem's clearest mark of traversing Greene's steps.

The last stanza of "Sugar Cane" assumes an almost apocalyptic air; one is reminded less of the Caribbean and more of the Christian Book of the Revelation of John as Grainger ends his poem with power and a stunningly perceptive message.

Ah me, what thunders roll! The sky's on fire!
Now sudden darkness muffles up the pole!
Heavens! What wild scenes, before the affrighted sense,
Imperfect swim! - See! In that flaming scroll,
Which Time unfolds, the future germs bud forth,
Of mighty empires! Independent realms! -
And must Britannia, Neptune's favorite queen,
Protect'ress of true science, freedom, arts;
Must she, ah! Must she, to her offspring crouch?
Ah, must my Thames, old Ocean's favourite son,
Resign his trident to barbaric streams;
His banks neglected, and his waves unsought,
No bards to sing them, and no fleets to grace?
Again the fleecy clouds amuse the eye,
And sparkling stars the vast horizon gild –
She shall not crouch; if Wisdom guide the helm,
Wisdom that bade loud Fame, with justest praise,
Record her triumphs! Bade the lacquaying winds
Transport, to every quarter of the globe,

Her winged navies! Bade the scepter'd sons
Of earth acknowledge her pre-eminence! –
She shall not crouch; if these Cane ocean-isodes,
Isles which on Britain for their all depend,
And must for ever; still indulgent share
Her forstering smile: and other isles be given,
From vanquish'd foes. – And, see, another race!
A golden aera dazzles my fond sight!
That other race, that long'd for aera, hail!
The British George now reigns, the Patriot King!
Britain shall ever triumph o'er the main.

Two methods of interpreting the previous lines are possible. The first is the economic "pre-eminence" of the British Empire in the eighteenth century holding tight to its sovereignty with an iron fist based out of the Thames, the river sought after by every merchant vessel in Europe and much of the rest of the world. Grainger's words of warning and apocalypse – "the sky's on fire!" and, "the thunders roll" – mark the beginning of the passage as something to be feared by his readers. "Independent realms" of a "barbaric" nature are given to rise in the future, the "future germs...of mighty empires" are a threat to the Thames, which Grainger laments may have to "resign his trident to barbaric streams," rivers elsewhere in the world that lead to the capitols of other empires besides Britain's. But, Grainger replies to the fear now in his reader's mind, if the British empire works intelligently, with "Wisdom" guiding her, then "Britain shall ever triumph o'er the main", and "she shall not crouch" to these alien, barbaric empires. The poet hopes that Fame will "transport, to every quarter of the globe, her winged navies" and have "the scepter'd sons of earth acknowledge her pre-eminence," giving Britain an almost angelic personification, one destined by God to rule the earth and the "Cane ocean-isodes" that "on Britain for their all depend, and must for ever." At first glance, then, the ending of Sugar Cane appears to be simply a pro-expansionist, pro-British piece and little more.
Grainger is thus characterized as someone solely interested in economic development of St. Kitts and islands similar to it, a fiscal-minded slavedriver whose sole goal through the writing of this Georgic is to instruct others in keeping slaves and making profit.

The above analysis avoids, however, what else has been discussed in *Sugar Cane* with the ease offered by a quick glance. Grainger has already written about Wisdom, degrading his fellow Englishman through their improper treatment of slavery and its victims, urging them to be virtuous and to act as the world’s most highly developed civilization and not like barbarians. Grainger’s view of the world coming to an end through the development of independent realms is not meant to be solely viewed as other countries splitting up and conquering one another; Grainger speaks of India and Argentina and Britain’s countless other territories, including the Caribbean, breaking away because of their enslavement to the British empire through mercantilism and harsh parliamentary laws designed to keep them subdued. He foresees every race in the world rising up against a harsh oppressor which is in this case a Britain without Wisdom guiding the helm. As he sees it Britain is an empire solely focused on making money, and not with virtue or cultural development or the fair treatment of its subjects. We have already seen how Barbados and other islands growing sugar cane were under the thumb of the British empire. Grainger entreats Britain to function as a wise and benevolent ruler rather than a despot or a power-hungry monarch, visualizing a country ruled by such things being acknowledged for its pre-eminence among all the people of the world. The Caribbean islands owned by Britain he sees as constantly dependent on Britain for their livelihood, and in this period of history they undoubtedly were. But, if Britain were to recognize what Grainger does, that Barbados, Jamaica, St. Kitts, and their fellow islands and inhabitants represented a culture of their own that was more concerned with breaking their chains and reacquiring their right to exist as first-class British citizens, *Sugar Cane* feels that the British empire would constitute another race surrounded by a golden halo: a heaven on earth, devoid of slavery and submission and destined to become the world’s greatest wonder.

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**Works Cited**


Subjective bias and science/inspection privations and preferences in the face of data-driven fairness

by Mary C. Clark
Mary Cleary is a Senior at Bridgewater State College who is majoring in history with a minor in secondary education. She first became interested in this project in Professor Maragart Lowe’s fall “Women who Made a Difference” course. She received a grant from the Adrian Tinsley Program that allowed her to research the women in the study, with Professor Lowe as her mentor. This report is the result of that study. She hopes to teach high school history and attend graduate school where she would like to further investigate the women in the study.

Separate Lives and Shared Legacies: Privilege and Hardships in the Lives of Twenty Women who Made a Difference

by Mary Cleary

Dr. Nancy Larrick is not well known, but she should be. She as one of the most influential people who shaped children’s literature during the latter half of the twentieth century. She edited fourteen poetry anthologies for children, wrote A Parent’s Guide to Children’s Reading, founded the International Reading Association which surveys students of all ages to determine reading preferences, and in 1965 published an influential article, “The All White World of Children’s Literature,” that was highly critical of the publishing industry of the day. She lamented the fact that “integration might be the law of the land, but most of the books children see are all white.” Changes in society such as the introduction of more diverse children’s books are often taken for granted and the individuals that worked to make those transformations possible are often forgotten. In fact, Dr. Larrick’s work came to my attention in an unexpected manner.

Students in Professor Margaret Lowe’s fall 2004 women’s history course offered at Bridgewater State College were given a seemingly simple task: locate an obituary in the New York Times of a woman who died within the last two years and “made a difference” in American history. [Appendix A] Students then had to write an essay about her and present their findings to the class. The students responded enthusiastically and were soon asking if they could choose a woman who they had read about in other newspapers, or saying that they wanted to reserve a certain woman even if their presentation was not scheduled for another month. Questions arose about the similarities and differences among the women, including their educational level, age at death, participation in sports and whether they married or had children. With the assistance of the Adrian Tinsley Research Program for Undergraduate Research, I have been able to discover a great deal about these women. A qualitative and quantitative analysis of the students’ reports has revealed two distinct patterns in the women’s lives:
one group consisted of women who came from privileged backgrounds where they received a great deal of support and encouragement; the other consisted of women who endured economic and social hardships. An examination of two of the women’s lives illustrates the two distinct patterns.

Dr. Nancy Larrick and Gloria Anzaldúa came from two very different walks of life. Larrick, born in 1910 to a lawyer and his homemaker wife, remembered her hometown of Winchester, Virginia as a place where everybody, including children, were treated with respect. She remembered a man who required a megaphone to hear, but still took the time to have lengthy conversations with her. Winchester was a tolerant place where snacks were served at the local jail, and the Civil War was not referred to in the common southern parlance as The War of Northern Aggression, but simply as “The War.”

Her 1978 poetry anthology *Crazy to be Alive in such a Strange and Wonderful World* was dedicated “In memory of my father Herbert S. Larrick who led me to appreciate the diversity and the beauty of human nature.”

If Larrick’s description of her early years contradicts many common assumptions about a socially stratified southern town where children were encouraged to remain quiet, Anzaldúa’s harrowing account of her experience as the oldest daughter of Texas migrant workers fits our standard view of the hardships and oppression that one normally associates with such a life.

Anzaldúa remembered her past in her 1987 book, *Borderlands/LaFrontera*. Her mother gave birth to her when she was sixteen, her father died at age thirty-eight, and as a result she harvested vegetables in the fields from the time she was four and into her college years. This passage from *Borderlands/La Frontera* describes her feelings about her childhood.

Some of my pain was cultural in origin—you know about being Mexican—some of it was because of my gender, so about being a girl who wasn’t supposed to be as important as my brothers, even though I was older. Part of this suffering was related to the fact that I was in pain most of the time because I was born with a hormonal imbalance, which meant that that I went into puberty very early on. I remember I was always made to feel ashamed because I was having a period and had breasts when I was six years old. Then I was this freak who was very sensitive. My way of dealing with the world was to read, to escape through reading.

Her medical condition was made worse by a lack of medical care or privacy. Despite the harsh conditions in which she lived, her love of books did propel her to become the first one in her neighborhood to attend college.

The adult lives of both women were as divergent as their early years. Larrick became the ultimate insider. After graduating from Goucher College at nineteen, she returned to her hometown to teach English. She returned to school twice: she received a graduate degree from Columbia in 1936 and a Ph.D. from New York University in 1955 at the age of forty-five. She was hired by Random House, where she was not pleased with the quality of workbooks for children. This set her on a mission to survey children about their reading preferences. In her 1964 poetry anthology, *Piping Down the River Wild*, she advised parents that “today’s children are not interested in poems about farms,” and instead recommended authors such as Robert Frost and Langston Hughes. She attributed her ability to develop new research methods to her own childhood. She said in *Crazy to be Alive in Such a Strange and Wonderful World*: “Now I look back and marvel at the respect given to me when I was a child. I just thought it was natural then.”


In contrast to Larrick, Anzaldúa became the ultimate outsider. In addition to being Mexican and poor, she also
had a debilitating type of diabetes. Though she was admitted to the Ph.D. program at the University of Texas in 1977, she left the program after “the advisor told me that Chicana literature was not a legitimate discipline, that it didn’t exist, and that women’s studies was not something I should do—And so, in a lot of those classes, I felt silenced.” This was in spite of the fact that the number of women’s studies courses offered in colleges had grown exponentially during that time, from 600 courses in 1972 to 3,000 by 1982.8 When she moved to California she was dismayed to learn that her fellow feminist activists thought she should “not have a culture.” 9 While continuing to work as an activist she wrote poetry and prose books such as *A Bridge Called My Back*.

Back that were published by small independent presses. Anzaldua returned to graduate school to again pursue her Ph.D. at the University of Santa Cruz. Unfortunately, she died as a result of complications of diabetes just as she was about to finish her dissertation.

This sample of twenty women who “made a difference” is small, but also quite diverse. Five of them were women of color, including Elma Lewis, the daughter of West Indian immigrants, who worked as an advocate for children’s art education in Boston, and Patsy Mink, an Asian American congresswoman who wrote the groundbreaking Title IX legislation. Their economic and social backgrounds varied considerably. The cookbook author and television personality Julia Child came from a wealthy family and had ancestors who had come to America on the Mayflower. Mink’s father was an engineer, and the tennis champion Althea Gibson’s parents were unskilled laborers.

It is difficult to sort out exactly why the sample is so diverse. Perhaps it attests to the fact that newspapers now give a wider range of women recognition for their accomplishments. Or it could be due to the fact that the students who selected the women were aware that people from all walks of life have made contributions to society and recognized that in their work. The background of the class could also play a part. Most Bridgewater State College students are from the surrounding area of small towns and mid-size cities, and the working or middle class. If the same assignment were given to students at either a state college in a large city or at a private institution the make up of the individuals chosen might change considerably. In any event, the women selected by the students provide a more varied view of twentieth-century women than a more homogenous group would, and their similarities and differences are well worth exploring.

The majority of the women had long life spans that enabled them to accomplish a great deal. Anzaldua died at 64, and Jenifer Estess, who founded Project ALS and succumbed to the disease at the age of 44, were the only two who did not achieve the biblical full life standard of three score and ten. Gertrude Dunn, a member of the All American Girls Professional Baseball League and the United States Women’s Field Hockey Team, was the only woman who died as a result of an accident when she perished because her single engine plane crashed when she sought a pilot’s license at the age of 71. Still, nine out of twenty of the women lived to be at least ninety. This allowed them to have quite long careers, even though some of them chose to take time off to attend to loved ones. For example, Katharine Hepburn accepted very little work for seven years during the 1960’s because Spencer Tracy, her long term lover, was seriously ill, but she still had a film career that spanned an incredible sixty two years from 1932’s *A Bill of Divorcement* (1932) to *Love Affair* (1994).

Obtaining an education was also a very important factor for most of these women, but a few faced barriers that made pursuing a higher education nearly impossible. Rose Gacioch, a member of the All American Girls Professional Baseball League, often missed high school to care for her cancer stricken mother who died when Gacioch was sixteen. Her father had died in a coal mining accident before she was born, and so she moved in with her sister and took a job in a factory. The aviatrix, Margaret Thomas Warren also left
high school after the apartment her widowed father rented in rural Texas burned down and the family members were dispersed. She described the aftermath of the incident in her autobiography *Taking Off*.

After mother had been dead for several years, I thought how fortunate she was to have died when she did; now she was free. But I always remembered that plane flying overhead.  

She often referred to this airplane that she had seen flying overhead when she was in first grade. The memory sustained her through a difficult childhood. Margaret Kelly, the dance troop leader, who was abandoned in an orphanage as an infant also left school early.

Some of the other woman did manage to attend college despite hardships. They employed different strategies in order to reach their educational goals. Althea Gibson managed to attend Florida A & M University because the school made the then unusual decision to offer a woman an athletic scholarship. Similarly, Gertrude Dunn rode her athletic talent to college by using the money she earned playing with the league between 1950 and 1954 to finance her education. Anzaldúa and Estess relied on student loans and financial aid.

One fascinating aspect of the privileged women's academic lives is that so many of them attended the same colleges. Four of them found their way to Columbia including both Gretchen Schuyler, a captain in the United States Lacrosse Team, and Nancy Larrick, who attended graduate school there. Rosemary Park was the president of Barnard, the women's college affiliated with Columbia, from 1962 until 1967. Frederica de Laguna, an anthropologist and author of sixteen books completed post graduate work at Columbia University after receiving her undergraduate degree from Bryn Mawr. Katharine Hepburn also received an undergraduate degree from Bryn Mawr, and Mildred Jeffrey, a union and civil rights activist, earned a graduate degree there. The cookbook author and television personality Julia Child received an undergraduate degree from Smith College, and the sports historian and Olympic Committee member Joanna Davenport attended graduate school there.

It is not a mere coincidence that these "women who made a difference" attended these schools. They not only provided a first rate education, but their faculties stressed their belief in the intellectual capacities of women. Bryn Mawr, established in 1885, set a new standard for academic excellence under the leadership of M. Carey Thomas, who was the first woman in the world to earn a Ph.D. She was a fierce advocate for women's rights. William Chafe describes her impassioned response to those who opposed the Equal Rights Amendment in his book *The American Woman*:

> It is strangely unsympathetic for opponents of an Equal Rights Amendment to suggest removing the thousands of inequalities and injustices by slow and piecemeal work...while women are being born, living their lives and dying without the justice which they have been waiting for since the time of the cave man.  

Smith College, established in 1875, also maintained high academic standards. Additionally, the college decided not to allow any sororities on campus, so that wealthy students such as Julia Child were not socially insulated. Barnard College was established in 1889, and more women earned Ph.D's from Columbia between 1920 and 1974 than at any other university in the country. The institution was also far ahead of the curve on gender studies. Glenda Riley indicates in *Inventing the American Woman* that Leta Hollingsworth confirmed that "male and female intellectual capacities were similar" while doing graduate studies at Columbia in the 1890's, and Barnard Dean Emily Putnum, analyzed women's roles throughout history in studies such as her 1910 work "The Lady: Studies of Certain Significant Phases in Her History."
Another very intriguing aspect of these women's lives is that at least five of them had mothers who received at least an undergraduate degree. These were Hepburn, Park, de Laguna, Child, and Jeffrey. Even though women made inroads in higher education by the late 1800's, their children were a very exclusive group. The first generation of college women married in very small numbers, and focused on their relationships with other women and on improving society. For example, just 45% of Bryn Mawr graduates prior to 1900 married. As a result, very few girls who were born in the United States in the early twentieth century had mothers who had a college degree.

It is impressive that this small cohort produced women who made important impacts in such diverse fields as entertainment, civil rights, and anthropology. It would be well worth exploring the lives of a larger group of women whose mothers received college degrees in the late nineteenth or early twentieth to discover if a pattern of high achievement is revealed.

Many of the women in the sample also pursued careers in higher education and challenged gender assumptions. In an era when full professorships were unusual for women, Fredericka de Laguna founded the anthropology department at Bryn Mawr. Her parents both taught at the school and her father, Theodore De Laguna, supported academic freedom at the institution by being amongst the professors at the college who sought greater classroom autonomy in 1916. The fact that she was very well respected as evidenced by the fact that her archeology expeditions attracted both male and female students from as far away as the University of Southern California. She also donated numerous artifacts to the school's museum. Rosemary Park was an innovative leader who questioned the value of rote memorization while teaching at Connecticut College and reduced the course load from five each semester to four in order to encourage "this strange kind of process we call thinking." When she was president of Barnard she insisted that the college obtain its own science laboratories rather than use Columbia's lest it "send a signal that it did not believe in science for women.

Gretchen Schuyler and Johanna Davenport both advocated on behalf of women athletes. Schuyler was proper enough to be hired as a teacher and athletic director at the prestigious Chapin School in Manhattan where she "had the fun of teaching a young Jackie Kennedy." Yet, she still pushed young women to excel in sports when she worked at Boston University. Ann Coakley, a professor emeritus at Bridgewater State College who followed Schuyler to the Lacrosse Hall of Fame said of Schuyler that "She led us to bigger and better things." Boston University awards the Gretchen Schuyler Award to its top female athlete and scholar each year. Davenport proved the value of the Title IX legislation by working as the women's athletic director at Auburn University from 1976 until 1987. She ended the practice of female and male athletes eating in separate dining halls, and was the first visiting professor of physical education at West Point. She also delved into sports history and published articles such as "The Normal Schools: Exploring our Heritage" that discussed the education of gym teachers in the early twentieth century.

While some women in the sample utilized their connections with elite universities to effect change, Elma Lewis created opportunities for others because of lingering anger over her own early struggles. The Boston Globe reported that after Lewis was dismayed to find her nursery school records that described her "as an exceptional 3 year old whose mental development as measured by IQ is probably, as is usual with members of her race, at a higher peak now than it will be when she grows older." She started a performing arts school in Boston, and was instrumental in starting the Museum of the National Center of Afro-American artists in Boston. She developed a reputation for anger but had a ready answer for critics: "If you are black and you are not angry, you belong in a mental institution."
She forged ahead with the arts programs even when money was scarce, and was one of the women in the sample who never married or had children.

The martial and romantic lives of the women varied considerably. Eight never married, nine were either widowed or were survived by their husbands, and three of them were divorced. The tennis champion Althea Gibson was the only one to be divorced twice, but Margaret Thomas Warren and Jean Hay, who was a disc jockey during World War II, both divorced their first husbands but had lasting second marriages. In some cases the women chose between career and marriage. de Laguna and Gacioch both broken engagements because their prospective husbands did not expect them to pursue their careers after the wedding. Julia Child found a more supportive spouse in her husband Paul who collaborated on her television and speaking tours and described himself and Julia as "twinnings in our reactions and tastes." The only disappointment she faced in her marriage was her inability to have children.

Infertility is only one possible explanation as to why fourteen out of the twenty women in the sample did not have children. Birth control devices were widely available in the United States by the early twentieth century. Katharine Hepburn greatly admired her mother's activism to promote birth control and decided not to have children. Estess had a "diaphragm in her purse" when it was needed thanks to the assistance of an older sister. Her plans to eventually have children were shattered when she was diagnosed with ALS at the age of thirty five. Anzaldua was a lesbian and other women in the sample might have been as well. Due to social constraints, lesbians rarely openly had children with their partners until the 1980s, when most of these women were well past their child bearing years.

Still, having children did not prevent six of the women from "making a difference" in public life. Dr. Elizabeth Kubler Ross, physician and author of the groundbreaking book *On Death and Dying*, had two children. With children in tow, she criss-crossed the nation on book selling tours. Perhaps, she felt determined to make a name for herself to overcome the fact that she had been a triplet whose unique qualities had ended up being buried. As she lamented in her book *Life Lessons*:

> In those days triplets were dressed alike, given the same toys, enrolled in the same activities and so on. People even responded to you not as individuals, but as a set. No matter how good we were in school, I quickly learned whether I tried or not, I would always get C's. One of us earned A's and another F's. Teachers always confused us, so it was safer to give us all C's. Sometimes I would sit on my father's lap. I know he did not know which one I was. Can you imagine what that does to our identity? 24

Jean Hay, who had three children, was more closely nurtured by her mother who traveled with her while she worked as a disc jockey and model. Hay later earned the designation of one of the nation's "Thousand Points of Light" by George Bush the elder for her work with the charitable organization Direct Relief International.

The personal lives of the women sampled only provide a partial answer to the question of how they were able to 'make a difference.' As a group they married less and had fewer children than the average American women of this particular time period. However, several of them did have long term relationships or marriages, and a few had children. Therefore, a review of the historical forces that shaped their lives, and how they responded to them is indicated. During the Great Depression, the gulf between the experiences of the better off group of women in the sample, and the less fortunate was extremely wide.

Despite the fact that unemployment was rampant and the standard of living for most Americans fell precipitously, some of the women were scarcely affected by the Great Depression. Hepburn and Child continued to receive allowances from...
their families. Child used her ties with fellow Smith graduates to prosper during those years. She shared an apartment with two of them, and conducted business with a few others who worked as buyers for large department stores in her job at an advertising agency. de Laguna began her pioneering studies in Alaska, in 1930, and managed to sustain her studies throughout this tumultuous decade. Schuyler played on the United States Women's Lacrosse Team in 1935, and Mildred Jeffrey obtained her graduate degree from Bryn Mawr that same year. Jeffrey, whose mother was the first female pharmacist in Iowa, was one of the first African Americans to graduate from that college that admitted its first African American student in 1931. She used her education to "make a difference" by working as a recruiter for the Amalgamated Clothing Workers of America at a time when unskilled or semiskilled workers faced reduced wages and harsh working conditions.

In contrast, several of the women in the sample faced formidable challenges during the Great Depression. Althea Gibson developed the tough skin that would serve her well when she faced resistance to her attempts at integrating tennis and golf at the national level. The Harlem that her family fled to when they could not survive as farmers, was particularly effected by the economic downturn. She also endured her father's frequent beatings, but as Francis Gray explains in her book *Born to Win, The Authorized Biography of Althea Gibson*, Althea reacted stoically.

No matter how hard he whipped her Althea always refused to cry. Even when he punched her that time, she pulled herself off the floor, socked him in the jaw, and made use of all the boxing lessons he had given her by fighting him as if she really were the boy he wanted for his first born.

When her plans to be a "lady boxer" were foiled because the trend died down, she relied on "lifting ice cream, fruit or potatoes for roasting" for sustenance. Sometimes she rode subway cars "like a zombie" when she could not find a place to sleep.

Margaret Thomas Warren endured unbearable hardship while living in New York during this period. A series of misfortunes nearly led to a tragedy after she lost her job selling airplanes. She was unable to pay the rent even in a cockroach infested room and reluctantly moved in with friends. She fell into despair and took an overdose of sleeping pills. Fortunately, she was saved when her friend woke up in the middle of the night and noticed something awry. Desperate for relief from her pain, she made a second suicide attempt by jumping out of a car that was transferring her to Islip State Hospital.

It was there that she turned things around. Warren was dismayed to see patients who were force fed, talked to themselves or received no visitors. A volunteer, Teresa Smyth, really listened to her and provided constant encouragement. The experience prompted Warren to help found the first Samaritan Group in the United States. Clearly, motivated by her traumatic experience, she explained the purpose of the group as "providing a friend to people who were contemplating suicide." Warren joined many other people throughout the world who have used personal tragedy as an impetuous to help others.

Rose Gacioch also experienced a set back in the 1930's. First the success; She performed so well in her company's sponsored softball league that the plant manager arranged for her to audition with the Ranger Girls, one of the Bloomer league teams. The Bloomer leagues had started in the late nineteenth century, and were staffed by working class girls whose attire and mannerism did not conform to gender ideals of the era. The bloomer leagues arguably offered the first opportunity for women in the United States to obtain recognition for and earn a living by playing sports. When the leagues closed down due to the financial pressures of the Great Depression, Gacioch had no choice but to return home to eek out a living as a production worker. She did this for several years, until World War II changed her life, along with that of legions of other women.
Gacioch's luck changed when she responded to a newspaper article about the American Girls Professional Baseball League and decided to try out. Her less than supportive co-workers told her she was "full of s-, she was twenty eight years old." However, she had withstood beatings and punishments such as kneeling on rice by her mother who detested her love for baseball. She learned to withstand any amount of criticism, and wasn't deterred when she was fired from the South Bend team because she "used poor English." One of her teammates later said that the "loss of Gacioch was felt for years to come." She performed quite well on the Rockford Peaches after being traded and had her best year in 1950.

The sociologist Susan Johnson called Gacioch an "important link between the Bloomer Leagues and the AAGPBL." This is vital point as otherwise the younger players on the team might not have realized that women's baseball did in fact have a rich history, even if some were promoting it as a temporary war measure.

The All American Girls Baseball League, which tried to distance itself from the bloomer leagues, functioned on the home front during World War II in several ways. In order to appease those who objected to what they perceived as 'masculine' behavior in the bloomer leagues the AAGPBL required linen skirted uniforms, make-up lessons, and mandatory charm school classes. The AAGPBL games were very popular and were generally played in minor league parks. This worked out well for the public that had money due to booming war time employment, but could not travel to major league parks due to gas rationing. The notion that the leagues were seen solely as entertainment is called into question by this statement made by Art. Mayeroff. The AAGPBL has "produced more sandlot activity among boys and girls than any influence of the last 25 years." The players also profited financially earning $50.00 to $125.00 a week when the average female factory worker earned $10.00 a week.

Gacioch furthered both the nation's and her own interest during World War II. This type of symbiotic relationship where both the nations and the women's goals were furthered was quite common during the conflict. Emily Yellin summarized the effects of women's participation in the war in her book Our Mother's War: Women at Home and on the Front During World War II.

Throughout the twentieth century women made strides as never before. When World War II broke out in the middle of the century, women already pioneering in fields such as politics, journalism, law, medicine, and science found career opportunities that during peacetime they may never have dreamed possible. In the same way that industry and the military opened up for women during the war, women with professional aspirations also made gains while the men were away at war. The urgent need for workers expanded recruitment efforts. For example, Lillian Faderman cites a Fleischman's yeast advertisement in her book, Odd Girls and Twilight Lovers: A History of Lesbian Life in Twentieth Century America that featured a women on a motorcycle who said "this is no time to be frail the dainty days are gone for the duration." One third of American women were either employed on the home front or enlisted in the military during World War II. However, of the twelve women in this sample a statistically astounding number of 8 out of 12 who were born before 1930, or seventy five percent, participated.

Margaret Thomas Warren's experience as a flyer made her an excellent candidate for war work, but she still had to overcome obstacles to make her contribution. As she explained in her book Taking Off that as aviation became more complicated and cost more money, opportunities for women decreased. This was not because of lack of interest but because "men did not welcome the competition." Women who wanted to join the WASP (Women Airforce Service Pilots) also faced resistance. The physical requirements were unduly strenuous and 50% of women who took the
test failed. When this happened to Warren, she took a job inspecting planes. She faced much less resistance in this endeavor, as 40% of the workers in aircraft factories during the war were women.

Mildred Jeffrey looked out for the interest of these women in her job as head of the Women's Bureau Branch of the United Automobile, Aerospace, and Agricultural Implement Workers of America. African Americans like her faced the double bind of racial and gender bias which Pauli Murray aptly called "Jane Crow." African American worked at good paying factory jobs for the first time during the war. Before that unskilled African American women had been mostly relegated to domestic work or the lowest paying and most undesirable industrial jobs in tobacco plants or steam laundries. Jeffrey not only joined the NAACP during the war, but also organized the first UAW women's conference that dealt with the plight of women who lost their jobs to returning veterans.

The women who Katharine Hepburn portrayed on screen during the war had little in common, at least on the surface, with those who toiled in war industries. The phenomenal success of the 1939 movie, *A Philadelphia Story*, which the playwright Phillip Barry based on Hepburn and her family, revived Hepburn's uneven career. Beginning in 1941 with *Women of the Year*, Hepburn starred in a series of 1940s movies that featured strong women characters like the powerhouse journalist she played in that film. In case anyone missed the point being made by fictional characters, more overt tactics were employed. Emily Yellin indicates that the actress played herself in the 1943 film *Stage Door Canteen*. In the film, she tells young women, Eileen, who is despondent because her fiancé had to ship out unexpectedly, that she must keep working in the canteen for his sake.

We're in a war and we've got to win. And we're going to win. And that's why the boy you love is going overseas. And isn't that why you're going to go back in there and get on the job?

Hepburn's advice to the fictional Eileen to remain working at a canteen to help the war effort soundly supported the government's efforts to draw women into war work.

The United States military sought highly educated women to fill its relatively small quota of women. This was a quite severe restriction at the time, as in 1940 only 5% of American women held undergraduate degrees. One possible explanation is that because the United States had a pressing need for women to work in munitions factories, there was no impetuous to recruit them to enlist as soldiers. WAVES (Women Accepted for Volunteer Emergency Services) trained at Hunter College in New York and were recruited by Professor Elizabeth Raynard at Barnard.

The war was a major turning point for Julia Child who joined the OSS (Office of Strategic Services). This was an opportunity that was only available to women "from wealthy families and did not need the money. Hence, they were not briable," according to Noel Fitch Riley. Her duties in China included devising an elaborate coding system for files, and also handing over brown opium filled envelopes to contacts. On a personal note, this is when she met her husband Paul. They began to sample the local Chinese food that they preferred to the cafeteria fare of jello and instant potatoes, even though it was fertilized with "night soil" or human wastes. The couple married after the war, moved to France due to Paul's career, and she began her career with cooking lessons at the Cordon Bleu.

Gretchen Schuyler's background qualified her for her work in the Red Cross. Applicants were required to be at least twenty-five and to have a college degree. Her experience as a coach paid off when she served as a captain in charge of thirty-two volunteers. Red Cross workers had the highest casualty rates of any women in World War II due to their proximity to the frontline. Schuyler's experience reflected this hazard: she served in Normandy, and won a bronze star by ferrying out mail from Belgium during the Battle of the Bulge.
Margaret Kelly also performed heroically in the face of war. A dancer who founded the dance troupe dance troupe the Blue Belles, Kelly was no stranger to adversity when World War II broke out. When her parents did not retrieve her from the orphanage where they had left her, she was raised by a nurse, Mary Murphy who Kelly later said "always made sure I had enough jam butties to eat." She began dancing lessons, with money earned from odd jobs, at the age of twelve to correct problems with her legs. Still, nothing could have prepared her for what happened next. She was imprisoned by the Vichy government in France with her Jewish husband Marcel Leibovici. The couple risked an escape from France, possibly because she was expecting her first child born just before they were apprehended. The Irish Ambassador was able to win her release because she was a citizen of Ireland, and her husband escaped. She hid him in a hotel room in Paris for the next few years. During that time they had to survive on the meager rations for one adult, and bribe the women who ran the hotel so she would not turn her husband over to the authorities.

Another women's war related death had a profound effect on two of the women in this study. Jean Hay was considering quitting her "Reveille with Beverly" radio show, when she heard that the actress Carole Lombard perished in an airplane crash while selling war bonds. After the death of her favorite actress Hay indicates that "I had pretty much decided I had to stick to my microphone." Her show, which was broadcast from Colorado, was later moved to California to air first nationally and later internationally. She would not even consider leaving the job to take the role in the movie version of her show because the soldiers enjoyed the broadcast. One recalled that she "had a sense of humor as strong as jail house coffee," and Captain Francis Fleet, the attache to George Patton stated "I remember when the war first started ....the guys had only a few things in common....the uniform, the lousy chow and Beverly." The 1939 Wimbledon tennis champion, Alice Marble, was also devastated by her friend Lombard's death and decided to take action. At the Stage Door Canteen in New York City she sang and played table tennis with soldiers. She also met and married Army Captain Joseph Crowley who was an intelligence officer. Sadly, she suffered a miscarriage when her car was hit by a drunk driver when she was on her way home from entertaining troops. A few days later she received a Christmas Eve telegram informing her that Crowley had been killed in action. The Intelligence Service asked the widow to obtain information from Hans Steinmetz, a former boyfriend. She complied, but narrowly escaped being discovered and killed. She received some satisfaction when some of the men who were listed in a ledger she had stolen were later charged with war crimes. However, her heroic days were by no means over. When Gibson's attempts to play at Forest Hills were rebuffed, it was Marble who shook the tennis world with this stinging rebuke:

I think it is time we faced a few facts. If tennis is a game for ladies and gentlemen, it's also time we acted more like gentle persons and less like sanctimonious hypocrites. The plea for tolerance from the war widow, heroine, and tennis champ was just the break that Gibson and her backers needed. Members of the Cosmopolitan Club, a group of wealthy and influential African Americans, sponsored Gibson in the hope that she would be the one who would finally integrate the tennis world. Cosmopolitan Club members were part of the Sugar Hill elite of wealthy Harlem residents whose ideals sometimes clashed with Gibson, who sometimes resented their middle class ideals. She recalled:

The Cosmopolitan members were the highest class of people and they had set ideas about what was socially acceptable behavior. They were probably stricter than most white people of similar position. But, I wasn't exactly ready to start studying how to be a fine lady. She accepted their admonitions when she realized she was still able to "fight like a tiger." While her supporters picked
up Marble's call and wrote letters that appealed to the ladies and gentlemen of the tennis world, Althea remained focused on winning. As Rosemary Durben said: "Althea was like a horse with blinders on. She kept her eye on the ball." 55

Gibson's ability to concentrate on her goals despite the controversy raging around her paid off handsomely. She made it to Forest Hills in 1950 and continued to hone her skills. She described the success of her efforts in Francis Gray's book Born to Win: The Authorized Biography of Althea Gibson;

After 56 nobody could beat me. I had the best serve in tennis, I had the best overhead in women's tennis, and I had the most killing volley in women's tennis. 56

The proof of this statement was found in her 1957 and 1958 victories in what is now called the United States Open. However, her crowning achievement was her historic victory at Wimbledon in 1957. She noted that "shaking hands with the Queen of England was a long way from being forced to sit in the colored section." 57

Gibson's jubilance was shared by many. The Associated Negro Press quipped that "If the negro can be Gibson hearted in his fight for his rights his triumph is only a matter of time." 58

Gibson's experience is not the only one that contradicts the traditional image of the 1950's as a placid time. Certainly some continued to prescribe a subservient role for women even in the face of atomic warfare. Elaine Tyler May describes civil defense plans in her book Homeward Bound: American Families in the Cold War Era.

A major goal of civil defense strategies was to infuse the traditional role of women with new meaning and importance, which would help fortify that home as a place of security amid the cold war. Even in the ultimate chaos of an atomic attack, appropriate gender roles would need to prevail. A 1950 civil defense plan put men in charge of such duties as fire fighting, rescue work, street clearing, and rebuilding, while women were to attend to child care, hospital work, social work, and emergency feeding. 59 However, there were others that challenged such gender specific limitations. de Laguna researched Tlingit Native American culture in the 1950's and when tribal members asked who she was she told them "I was a teacher from "back east" who wanted to learn to teach about the Indians, so my students and others would learn to respect them." 60 She described Tlingit efforts to secure civil rights:

The most important developments of recent years have been the extension to the Alaska natives of full citizenship and the legislation abolishing certain discriminatory practices. These have been won largely through the Tlingits' own efforts, especially by the Alaska Native Brotherhood and its affiliated sisterhood 61

Other women in this sample also rejected the common expectation of the 1950's that women's employment only served to supplement their families income, and had no intrinsic value. Larrick earned her Ph.D. in 1955, was hired by Random House, and published her book Reading in Action in 1957. Julia Child tested recipes for her cookbook throughout the decade.

Child had a much too close look at the worse abuses of the 1950's anti-communism when her husband Paul was investigated for communist sympathies and homosexuality. She had taken a firm stand against unwarranted suspicion when Smith College sent a letter to its alumnae explaining that some of its teachers were being investigated for communist sympathies. Child's blistering reply to the letter is recounted in her authorized biography:

According to proper democratic methods, charges of this grave nature should first be brought to the Board of Trustees. You have assumed a responsibility for which you were not appointed. It is clear that you do not trust elected officials and that you do not have confidence in democratic procedures. ...In Russia today, as a method of getting rid of opposition,
an unsubstantiated implication of treason, such as yours, is often used. But it should never be used in the United States. 62

The issue hit close to home when investigators focused on Paul. After a grueling interrogation, in which he was asked to lower his pants, he was cleared of being either a communist or homosexual. Julia was questioned about her longstanding friendship with Jane Foster, who had also served in the OSS, and told them curtly “I don’t think somebody that disorganized could be a spy.” 63

Although not every woman was as directly challenged by the excesses of the decade as Child, many of them shared her resolve to prevail. In Joyce Follet’s film Step by Step: Building a Feminist Movement 1941-1977 union leader Addie Wyatt states: “When I speak to young women about the road we have traveled they have no idea.” 64 As an example she explains that in one plant women were paid fourteen cents less an hour than men and “most of the women thought that was OK.” 65 Women like Wyatt supported the election of John F. Kennedy in record numbers both as campaigners and as voters. But, when he failed to deliver on a campaign promise to hire a woman cabinet member, he was confronted at a news conference and admitted: “I probably haven’t done enough.” 66 He subsequently appointed the Commission on the status of Women that was headed by Eleanor Roosevelt and called for “equality for women at all levels.” 67

This was a lofty goal that would require many years of hard work to accomplish. Women fought for inclusion in the 1964 Civil Rights Act which President Lyndon Johnson said would “eliminate the last vestiges of inequality in our beloved country.” 68 However, many women found that enforcing Title VII of the act was more difficult. The Equal Opportunity Commission, focused on racial equality and would not offer assistance even with flagrant violations of the law such as sex segregated employment ads in newspapers. These and other abuses led to the formation of the National Organization for Women in 1966. NOW initially had a broader membership than one might suspect. One quarter of the charter members were union working class women who sought reforms such as a higher minimum wage.69

The pursuit of equality was complicated by disagreements on just what it meant. Betty Friedan’s 1963 book The Feminine Mystique discussed the dilemma of the housewife who needed a career to find personal fulfillment. Many women were inspired by Friedan’s message but some took exception. Shelia Rowbotham describes some of the women who did not wholeheartedly embrace Friedan’s message in her book A Century of Women: The History of Women in Britain and in the United States:

There was real substance to the thwarted unhappiness that Friedan uncovered and her book was to have a formative effect on 1960’s radicalism. On the other hand, Betty Friedan missed the nuances of suburban middle class life which did not fit so neatly into the case she was making; she thus crystallized an experience which was only part of the truth and did not bother with contrary material. There were plenty of women who were extremely busy and active outside the home even though they were not in paid employment, while others preferred time at home when the children were young and paid work as they grew older. 70

If women disagreed sometimes on just what feminism meant, and this sometimes led to unproductive infighting amongst them, the ability to have a dialogue on contested issues was beneficial in the long run. The only alternative would have been to replace the 1950’s ideal of the homemaker with a new model of a career women that every woman was expected to abide by regardless of her inclination.

The women in this sample made inroads on several fronts in the ensuing decades. Marge Schott used inherited money to finance her battle to be the first woman allowed to own a General Motors dealership in a major metropolitan area. Patsy Mink became the first non-white women elected
to Congress in 1965. The first woman to graduate from the University of Chicago law school in 1951, she was dismayed to be turned away from the House gym, and wrote the Title IX legislation. She also detested the stereotypes about Asian Americans such as they were "inscrutable" and railed against the Vietnam War. Elizabeth Kubler-Ross published On Death and Dying in 1969 and followed this up with several other books that questioned the way the medical community dealt with death. Her books made a lasting impression on society, and almost thirty years later Jenifer Estess received a copy of On Death and Dying after she was diagnosed with ALS.

Estess was not interested in stoically accepting her fate. Her family life had been thrown into a tailspin when she was a teenager and her father left the family and in her words "acted like he was in the witness protection program" and was never seen again. Their mother "went to bed for two years" and she and her sisters Valerie and Meredith supported each other financially and otherwise. Meredith states in the documentary film "Three Sisters in Search of a Cure" that they knew from that experience that "work was the way to solve problems" when Jennifer became ill. They founded Project ALS, an organization that the actor Richard Kind described as a "twenty million dollar company started with an Ikea and two milk crates." The unique aspect of the organization is that it encourages doctors working on the disease to network with each other. This avoids the situation where in Meredith's words "we have a smart guy here and a smart gal there but nobody is talking to each other." Estess condition deteriorated quite markedly soon after Project ALS was founded, and she realized that a cure would not come in time for her. Her resolve to find a cure was not dampened and her sisters continued to work for the foundation after her death in December of 2003.

Estess was one of several women in the sample whose ability to "make a difference" can be traced to their having overcome serious obstacles. She lacked parental guidance at a very young age as did Warren, Kelly and Gacioch. They needed to support themselves financially, and developed the self reliance needed to survive in trying conditions. When they later had to cope with serious difficulties they had the skills necessary to triumph. The ability to deal with adversity can be critical to success in trying circumstances.

Gibson might not have been able to integrate tennis and golf on a national level, if she had not dealt with the consequences of racism and poverty. Dr. Robert Coles studied students who were placed in southern schools during the first years of school desegregation in the late 1950’s. It was not uncommon for students who had been "handpicked" as the first student to enter a school on criteria such as being "polite and neatly dressed" to be unable to withstand the stress. On the other hand he found that some children who came from tougher backgrounds: "draw in tough times upon a sense of humor or a relaxed disposition which might not be ingratiating to others, but may be quite resilient and enduring."

On the other end of the spectrum Fredericka de Laguna is an example of somebody who was able to thrive because she was insulated from cultural norms about gender. With her parents and her own career at Bryn Mawr she was nearly always in an environment where female achievement was respected. Additionally, the anthropology field was open to women before many other disciplines were. As a result de Laguna had several female colleagues, such as Margaret Mead and Ruth Benedict, when she began her work in the 1930’s. Similarly, Katharine Hepburn's mother campaigned against prostitution and for birth control, but her father also addressed the consequences of unchecked male sexuality in his efforts to educate the public about the dangers of venereal disease. She was not exposed to a double standard of behavior and grew up to be an independent woman herself, as well as to support the emancipation of other women.

Considering the strides that women continue to make, it is inevitable that some day a woman will be elected president.
of the United States. When that day comes, surely there will be many people who will look back on this woman’s early life. Most likely what they will find is that she started out with a lot of advantages and received a great deal of help along the way. However, the experience of the women in the study suggest another possibility. It is feasible that out first female chief executive will be motivated to assist others because she understands the plight of the disadvantaged only too well.

(Endnotes)

2. Nancy Larrick, Crazy to be alive in such a Strange World: Poems about People (New York: Lippincott, 1977), V.
3. Ibid.
5. Nancy Larrick, Piping Down the Rivers Wild a Merry Mix of Poems for all Ages (New York: Doubleday, 1968), VIII.
6. Nancy Larrick, Crazy to be , VI.
17. Ibid.
19. Ibid.
21. Ibid.
26. Ibid., 21.
27. Ibid.,2.
28. Ibid.,23.
31. Ibid.,211.
32. Ibid.
33. Ibid.,41.
34. Ibid.,34.
37. Ibid.,120.
39. Emily Yellin, Mother’s War , 152.
40. Emily Yellin, Mother’s War , 49.
41. Ibid.,201.
42. Ibid.,212.
44. Ibid., 84.
45. Ibid., 91.
46. Some sources indicate that Julia Child developed a shark repellent to protect sailors during World War II. Since this is not included in Noel Fitch Riley’s exhaustive
biography of Child, I have doubts as to its credibility. It is more likely that her work in the “fish squeezing unit” in which new OSS recruits tried to determine how long stranded sailors could survive on water that they sucked out of fish was simply exaggerated over the years. Riley relates a similar incident in which Julia dropped a perch and picked it up while filming her television show. Over the years stories circulated that it had been a chicken, leg of lamb or side of beef.

47 Emily Yellin, Mother’s War, 175.
49 Emily Yellin, Mother’s War, 76.
51 Ibid.
52 Francis Gray, Yarnick Rice Lamb Yarnick, Born to Win, 53.
53 Ibid., 30-31.
54 Ibid., 34
55 Ibid., 63.
56 Ibid., 94.
57 Ibid., 97.
58 Ibid., 107.
61 Ibid., 8.
62 Noel Fitch Riley: Appetite for Life, 204.
63 Ibid., 226.
65 Ibid.
66 Ibid.
67 Ibid.
68 Ibid.
69 Ibid.
71 Deborah Gillan Straub, Asian American Voices (Detroit: UXL, 1997), 166.
72 There are conflicting accounts concerning why Dr. Kubler-Ross decided to become a psychiatrist. One source indicates it was because she saw death first hand while working at in a death camp after WWII, and another that she was denied an internship as a pediatrician because she was pregnant.
73 Valerie Estess, Jenifer Estess, Tales from the Bed, 41.
74 Ibid.
76 Valerie Estess, Jenifer Estess, Tales from the Bed, 173.
77 Joseph Lovett, “Three Sisters”.
Bibliography


Appendix A

*List of Women*

Anzuldua, Gloria: (1942-2004)
Prize winning poet and prose author who explored issues of race, economic conditions and sexual orientation

Child, Julia: (1912-2004)
Espionage worker during World War II, cookbook author and television personality
Davenport, Joanna: (1933-2004)
Sports historian, coach and advocate for women athletes

De Laguna, Frederica: (1906-2004)
Anthropologist and educator noted for her work on Alaskan Indians, and for founding the anthropology department at Bryn Mawr

Dunn, Gerturde: (1933-2004)
All American Girls Professional Baseball League member, United States field hockey team member, teacher and business women who sold field hockey uniforms to colleges.

Estess, Jenifer: (1957-2003)
Produces and ALS victim who founded Project ALS, a charitable and advocacy organization for persons with ALS and related conditions

Gacioch, Rose M. (1915-2004)
Member of the all American Girls Professional Baseball League, and Bloomer League player

Gibson, Althea: (1927-2004)
Tennis champion and golfer who integrated both sports at the national level

Hay, Jean: (1917-2004)
World War II disc jockey and spokesperson for Direct Relief International

Hepburn, Katharine: (1907-2003)
Academy ward wining actress who was noted for her portrayal of strong women

Jeffrey, Mildred: (1911-2004)
Civil rights advocate and union organizer

Kelly, Margaret: (1910-2004)
Dancer and dance troop leader

Kubler-ross, Elizabeth: (1926-2004)
Psychiatrist and author who dealt with issues of terminal illness and death when they were not generally openly discussed

Larrick, Nancy: (1910-2004)
Children's book editor who advocated for diversity and quality in children's literature

Lewis Elma, (1922-2003)
Advocate for the education of African Americans and founder of the Elma Lewis school for the performing arts

Mink, Patsy: (1927-2002)
First Asian American congresswomen and strong proponent of civil liberties who drafted the Title IX legislation
Park, Rosemary: (1907-2004)
Educator and president of Barnard who worked for better educational opportunities for women and teacher candidates

Schott, Marge: (1928-2004)
Businesswoman who owned the Cincinnati Reds, was the first woman to run a GM dealership and donated to numerous charities

Schulyer, Gretchen: (1911-2002)
Captain of the first United States Olympic Lacrosse team and captain of the Red Cross in World War II, coach and educator

Warren Thomas Margaret: (1912-2004)
Aviator and inspector of airplane plants during World War II, co-founder of the first Samaritan organization in the United States
Monosaccharide Interactions with Rh(III) cis-Bipyridine Complexes

BY SARAH M. LANE

Abstract

Carbohydrates are extensively involved in a variety of cell-cell interactions, including cell-cell recognition communication, adhesion, and signaling. The ability to manipulate these carbohydrate activities could have numerous medical applications, such as treatments for cancer or infectious diseases. We are currently examining the ability of metal complexes to selectively bind to the specific saccharides, d-glucose and d-mannose. In particular, we are interested in preparing solvated cis-bis-chelates of Rh(III). Reaction of [Rh(bpy)₂Cl]PF₆ with two equivalents of AgBF₄ does not give the expected disubstituted species, [Rh(bpy)₄(DMF)₂]³⁺. Instead, the monosubstituted complex, [Rh(bpy)₂(DMF)Cl]BF₄ was obtained in a 34% yield. The ¹H NMR spectrum of [Rh(bpy)₂(DMF)Cl]³⁺ confirmed the adjacent position of the DMF and Cl⁻ groups. Likewise, reaction of [Rh(bpy)₂Cl]PF₆ with neat triflic acid produces cis-[Rh(bpy)₂(OTf)Cl]OTf instead of the expected bis-chelate complex. ¹H NMR of the product reveals a mixture of isomers. Both cis-[Rh(bpy)₂(DMF)Cl]³⁺ and cis-[Rh(bpy)₂(OTf)Cl]⁺ react with glucose in basic solutions. Preliminary titrations studies of these compounds with simple monosaccharides reveal that complexation between rhodium and monosaccharides occur as evidenced by UV-vis spectral changes.

The interactions between metals and carbohydrates have been a subject of recent notice in chemistry.¹ This is due to the important roles metals carry out in the biochemical processes of oligosaccharides. These processes are carried out by the binding of oligosaccharides to specific proteins called lectins.
are involved in cell-cell interaction, including binding of glycoproteins, which take part in viral replication, cell recognition, and cell growth. The association of lectins and saccharides is primarily via hydrogen bonding; consequently, such interactions tend to be weak. Therefore, interfering with the functions of oligosaccharides, by replacing its hydrogen bonding with lectins for a more stable metal-saccharide bond, could lead to the ability to control the physiological processes of cellular interactions.

There are a limited number of well characterized metal-sugar complexes; therefore it is crucial to establish the conditions needed to bind simple monosaccharides to a metal. The circumstances under which this takes place can then be applied to a future goal of building a polymetallic system capable of targeting specific carbohydrates. Of relevance to this goal is studying simple monometallic-saccharide interactions, in an effort to provide information on the binding sites of the sugar and the affinity of various sugars to a metal (figure 1). The binding sites on a monosaccharide are hard to predict because their fixed orientation limits the ways in which the hydroxyl groups on the sugar can coordinate to a metal. In addition, monosaccharides change conformation in solution, which hinders their interactions with metals.

![Figure 1. Possible binding sites of monosaccharides to metal.](image)

Nevertheless, some researchers have been successful in complexing monosaccharides to metals, including sodium, calcium, and lanthanide compounds. Palladium, a second row transition metal, has been successfully bonded to a series of five carbon sugar rings and six carbon sugar rings. There are, however, a limited numbers of second and third row transition metal-monosaccharide complexes, and no known rhodium-monosaccharide complexes. Herein we report on our efforts to examine the ability of rhodium bis-bipyridine complexes to bind simple monosaccharides.

**Results and Discussion**

Our initial efforts have focused on the synthesis of cis-[Rh(bpy),(DMF)] where bpy = 2,2-bipyridine and DMF = dimethylformamide. Bipyridine complexes of rhodium were selected as starting materials because of the stability such chelating ligands afforded. The cis-orientation of the bipyridine ligands will create two adjacent coordination sites that may accommodate the hydroxyl groups of a monosaccharide (figure 2).
The coordinated solvent molecules are expected to be weakly held and therefore readily replaced by an incoming sugar. In addition the overall 3+ charge of the complex should further promote sugar complexation.

To prepare the target compound we chose cis-[Rh(bpy)$_2$Cl$_2$]PF$_6$ as our starting point. In 2001, Kim et al. successfully displaced the chloride ions of [Rh(bpy)$_2$Cl$_2$]PF$_6$ with bipyridine and H$_2$O using Ag$^+$ under thermal conditions. The Ag$^+$ ion reacts with the coordinated Cl$^-$ ions to produce AgCl which precipitated from the solution. Accordingly we reacted [Rh(bpy)$_2$Cl$_2$]PF$_6$ with two equivalents of AgBF$_4$ in DMF. Stirring at room temperature for 24 hours provides an orange/yellow solution and a grey precipitate. Filtration of the solution followed by slow addition of toluene yields a pale colored solid.

The $^1$H NMR of the solid shows a series of resonances from 7.70 ppm to 9.91 ppm that corresponds to the aromatic bipyridine protons (Figure 3).
Integration of this region indicates that there are a total of 16 magnetically inequivalent protons. Based upon its symmetry a $^1$H NMR spectrum of the compound cis-[Rh(bpy)$_2$(DMF)$_2$] is expected to have eight signals from the bipyridine protons in the aromatic region. Each bipyridine has a total of eight protons, with four protons on each ring. A cis conformation of the DMF ligands would create two sets of inequivalent bipyridine rings. One bipyridine ring would be trans to the coordinated DMF while the second ring is cis to the DMF. Such an arrangement would produce a total of eight inequivalent protons. However, the presence of sixteen protons signals indicates that two different groups occupy the remaining coordination sites. In other words the spectrum suggests that only partial substitution occurred to give the monosubstituted DMF complex, cis-[Rh(bpy)$_2$(DMF)Cl]$^+$

This would cause the two bipyridines to become inequivalent, with one bipyridine ring trans to a chloride and the second bipyridine ring trans to the DMF group. The presence of coordinated DMF is readily evident from the $^1$H NMR spectrum and appears as 3 signals at 2.98 ppm and 3.17 ppm for the inequivalent methyl groups, and 8.12 ppm for the formyl protons. Integration of these resonances confirms that there is only one DMF complexed. The IR spectrum of cis-[Rh(bpy)$_2$(DMF)Cl]$^+$ further supports the presence of coordinated DMF. A strong carbon oxygen double bond appears at 1651 cm$^{-1}$ corresponding to the carbonyl group of the DMF. This absorption appears at lower energy than in free DMF and is indicative of oxygen bound DMF. A strong broad band attributed to the B-F stretch of a BF$_4$ counter ion appears at 1060 cm$^{-1}$, confirming the formation of Rh(III) cationic species. The UV-vis spectrum of cis-[Rh(bpy)$_2$(DMF)Cl]$^+$ shows a single band at 314 nm that gradually tails into the visible spectrum.

When the synthesis of cis-[Rh(bpy)$_2$(DMF)Cl]$^+$ proved to be problematic, the focus was turned to the compound [Rh(bpy)$_2$(OTf)$_2$]OTf$^-$

Triflate (OTf = CF$_3$SO$_3$) is a very labile ligand, and is readily displaced in favor of other ligands. Synthesis of the triflate complex [Rh(bpy)$_2$(OTf)$_2$]OTf was attempted by reacting two equivalents of triflic acid with [Rh(bpy)$_2$Cl)$_2$]PF$_6$ in ortho-dichlorobenzene, and heating just below reflux (figure 4).
Figure 4. Synthesis of cis-[Rh(bpy)$_2$(OTf)Cl]$^+$.  
During the course of the reaction, the neat triflic acid protonates the chloride ion producing HCl. The HCl then escapes as a gas from the solution. After heating the reaction for a total of five hours an off white solid was precipitated by addition of diethyl ether. The $^1$H NMR spectrum of the solid, shown in figure 5, clearly indicates that the solid is composed of two components.

A resonances: [Rh(bpy)$_2$(OTf)(Cl)]$^+$; 16 protons indicate this complex is present.
B resonances: trans-[Rh(bpy)$_2$(Cl)$_2]^+$ or trans-[Rh(bpy)$_2$(OTf)$_2]^+$; 4 protons indicate one of these complexes is present.

Figure 5. $^1$H NMR of cis-[Rh(bpy)$_2$(OTf)Cl]$^+$. 
The major component (labeled as A resonances) is believed to be the partially substituted triflate complex, [Rh(bpy)$_2$(OTf)Cl]$^+$. This conclusion is justified by the presence of sixteen inequivalent bipyridine protons in the aromatic region. The second product (labeled as B resonances) is believed to be trans-[Rh(bpy)$_2$(L)$_2$]$^+$, where L represents either Cl$^-$ or OTf. Because each ring of the bipyridine is equivalent, only four signals appear in the spectrum corresponding to the four unique protons. The relative intensities for aromatic resonances suggests that 73% of the sample corresponds to the cis-[Rh(bpy)$_2$(OTf)Cl]OTf isomer.

The UV vis of the triflate complex in DMF shows a split band in the UV region. Over a period of 12 hours the two bands coalesced into a single absorption at 311 nm. This strongly indicates that the triflate ligand was displaced by DMF, but the process is slow. After taking into account the minor impurities the spectrum is identical to that of the cis-[Rh(bpy)$_2$(DMF)Cl]$^{2-}$ compound. The similarity of these spectra is more evidence that the chloride substitution was incomplete and the major product of the triflate synthesis is cis-[Rh(bpy)$_2$(OTf)Cl]$^+$.  

Reactions of [Rh(bpy)$_2$(Cl)L]$^{n-}$ (L=DMF, OTf) with Monosaccharides:

The reactivity of the monosubstituted DMF compounds with d-glucose and d-mannose was analyzed through a series of titrations. The titrations were performed in DMF by adding increasing amounts of d-glucose and d-mannose in a strongly basic solution (pH=12). The reactions were monitored by UV-vis spectroscopy (figure 6). The type of spectral change differed between the two rhodium compounds used. For example, upon addition of increasing quantities of sugar to the compound [Rh(bpy)$_2$(DMF)Cl]$^{2-}$, a split band formed as a downward shift in absorbance occurred (Figure 6).
Figure 6. UV-vis spectrum of the compound cis-[Rh(bpy)$_2$(DMF)Cl]$_2^+$ titrated with glucose (top) and mannose (bottom).

Whereas the spectrum of the complex [Rh(bpy)$_2$(OTf)Cl]$^+$ showed a downward shift in absorbance (Figure 7), but the spectrum of the complex started off with a split band, which would mask any similar effects as the sugar had on the rhodium-DMF compound. In both instances the addition of increasing amounts of sugar produced spectral changes.

Figure 7. UV-vis spectrum of the compound cis-[Rh(bpy)$_2$(OTf)Cl]$^+$ titrated with d-glucose.

The cause of the spectral changes will be further analyzed, but based upon the results a hypothesis is formed that the deprotonated hydroxyl groups of the sugar are a strong enough donor to replace both the DMF and Cl$_-$ ions. Attempts will also be made to isolate the products in the solution for further characterization. Further reactions between d-glucose and [Rh(bpy)$_2$(DMF)Cl]$^+$ in DMF took place under inert atmosphere. A color change occurred upon heating, but thus far no solid has been isolated.

Conclusion

The attempted synthesis of the disubstituted rhodium compounds cis-[Rh(bpy)$_2$(DMF)$_2$]$^{1+}$ and cis-[Rh(bpy)$_2$(OTf)$_2$]$^+$ did not fully work. The second chloride is more difficult to remove, creating the monosubstituted compounds cis-[Rh(bpy)$_2$(DMF)Cl]$^{2+}$ and cis-[Rh(bpy)$_2$(OTf)Cl]$^+$. The monosubstituted compounds still showed some reactions with sugar, as evidenced by the spectral shifts in the UV-vis. We are currently trying to isolate any rhodium-monosaccharide complexes that may be present in these solutions and characterizing them, using IR and $^1$H NMR spectroscopy, and ultimately x-ray diffraction. Concurrently, we are examining additional routes to the disubstituted solvated rhodium complexes and monitoring their reactions with simple monosaccharides.

Experimental

General Considerations: All reactions were performed under an inert atmosphere in a drybox, or on a double-manifold vacuum line using standard schlenk techniques. All solvents were purchased from commercial sources including DMF, toluene, tetrahydrofuran (THF), diethyl ether, and ortho-dichlorobenzene. In addition the reagents AgBF$_4$, triflic acid, d-glucose, and d-mannose were also purchased from commercial sources. The starting material [Rh(bpy)$_2$Cl]$_2^{2+}$ was synthesized according to literature preparation.$^7$ All UV
visible spectra were collected using a Hewlett-Packard 8543
diode-array spectrophotometer. Infrared spectroscopy was
performed as a nujol mull between sodium chloride plates.
$^1$H NMR studies were performed on a 400 MHz JEOL-ECX
spectrometer.

**Synthesis of cis-[Rh(bpy)$_2$(DMF)Cl]:** In a 20mL vial, 0.200 g (3.96 x 10$^{-4}$ mol) of [cis-Rh(bpy)$_2$$_{2}$]-Cl$^{2-}$ was reacted
with (0.189 g) of AgBF$_4$ in 3mL of DMF. This reaction
was left to stir for approximately 24 hours. The resulting
dark silver chloride precipitate was removed by filtration.
Following filtration, the solution was transferred to a 125 mL
Erlenmeyer flask and toluene was slowly added to bring the
volume up to 50 mL. The resulting light grey precipitate was
isolated by decanting off the colorless solution. The solid
was washed twice with 2 mL of tetrahydrofuran (THF). Yield,
34%. $^1$H NMR (400 MHz, CD$_2$D-DMF, $^1$H), 9.91 (d, 1H), 9.27(d, 1H), 9.14(t, 2H), 9.01(q, 2H), 8.79(m, 2H), 8.52(t, 1H), 8.46(t, 1H), 8.31(q, 2H), 8.25(d, 1H ), 8.12(s, 1H, HCO), 8.00(d, 2H), 7.80(t, 1H), 7.70(t, 1H), 3.17(s, 3H, -CH$_3$), 2.98(s, 3H, -CH$_3$).

**Synthesis of cis-[Rh(bpy)$_2$(OTf)Cl]:** In a 250mL
schlenk flask 0.500g (7.92 x 10$^{-4}$ mol) of the rhodium-
dichloride is dissolved in 50mL of ortho-dichlorobenzene.
The reaction stirred at room temperature for 25 minutes.
Then 2.11 mL of neat triflic acid was syringed in and the
reaction was stirred while cooling on ice for 15 minutes. The
reaction was then heated just below reflux for 2.5 hours. Then
the reaction was cooled on an ice bath, while stirring, for 20
minutes. Another 2.11mL of triflic acid was syringed in and
the reaction continued to stir in the ice bath for 15 minutes.
The reaction was then heated below reflux for another 2.5
hours. The reaction was then cooled for 30 minutes on an
ice bath, and 80 mL of diethyl ether was added while the
reaction continued stirring. An off white solid precipitated
and was filtered under argon. The solid was stored under
argon in the drybox. 0.83 grams was isolated. $^1$H NMR (400
MHz, D$_2$-DMF, $^1$H), 9.29 (d, 2H), 9.11 (d, 2H), 9.10 (s, 1H), 8.94
(d, 2H), 8.79 (t, 2H), 8.56 (t, 1H), 8.41 (t, 4H), 8.13 (d, 1H), 7.98 (d, 2H), 7.92 (s, 5H), 7.81 (t, 1H), 7.64 (t, 2H), 7.35 (m, 3H), 7.32 (m, 3H), 3.30 (m, 2H), 2.82 (s, 2H), 2.66 (s, 2H).

**Reactions of [Rh(bpy)$_2$(Cl)L]$^{2+}$ (L = DMF, OTf
 ) with d-glucose and d-mannose:** Titration studies
of [Rh(bpy)$_2$(DMF)Cl]$^{2+}$ and [Rh(bpy)$_2$(OTf)Cl]$^{+}$ were
monitored using Uv-vis spectroscopy. The same cuvette was
used the duration of each titration. In the cuvette 200 µL of
4.5x10$^{-4}$ M [Rh(bpy)$_2$(L)Cl]$^{2+}$ (L = DMF or OTf ) was added
to varying amounts ( about 0.3-15 equivalents) of 0.01M d-
glucose, and (about 0.3-10 equivalents) 0.01M d-mannose in
a 0.01M NaOH solution. DMF was added to bring the total
volume to 2 mL. Once prepared the electronic spectrum of
each solution was measured immediately.

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Endnotes


Origin of Gabbroic Xenoliths within the Lone Mountain Dacite Intrusion, Big Sky, Montana: A Field and Petrographic Analysis

BY EMILY CLEMENT

Abstract

Lone Mountain represents a dacite laccolith that intruded in Late Cretaceous time ~68 Ma. This intrusion resulted in contact metamorphism of the sedimentary country rock resulting in formation of a thin zone of black hornfels. Field work reveals the presence of abundant, 1-9 cm sized gabbro xenoliths and lesser amounts of siltstone inclusions within the dacite intrusion. Compositionaly, the Lone Mountain dacite consists of hornblende + plagioclase + biotite + quartz + opaques. Whereas the gabbroic xenoliths consist of pyroxene + hornblende + plagioclase + minor chlorite.

This study is concerned with the origin of the gabbroic xenoliths and their relation to the dacite intrusion. A major question we answer is, does the gabbro and dacite represent magmatic differentiation of an initial mafic magma or are the xenoliths an older crystallized mafic pluton intruded by a younger intermediate composition Lone Mountain dacite? Petrographic evidence suggest the two may be related based on their similar mineral assemblages.

INTRODUCTION

The geology of southwest Montana has involved a long and complex history of magmatic activity spanning tens of millions of years. Igneous rocks found within the Gallatin Range record just a small piece of a much larger geologic story. This portion of Montana was intruded by a series of medium-sized plutons related to the subduction of the Farallon tectonic plate beneath western North America some 70-50 million years ago. This was a time of intense and compositionally diverse magmatism that affected a large area of the North American Cordilleras (Feeley, 2003). Current models for the origin and evolution of these magmatic bodies involve either; 1) the generation of mantle-derived mafic mag-
mas that differentiate and change composition over time, or 2) magma mixing of a mafic magma with a felsic, crustal component resulting in a hybrid magma (Feeley, 2003; Feeley & Cosca, 2003).

Lone Mountain represents a large laccolith or mushroom shaped pluton that intruded and crystallized ~70 Ma (Kellogg & Harlan, unpublished data, 1994; Tysdal et al., 1986). It intruded a sequence of Cambrian to Cretaceous-aged sedimentary rocks that consist of sandstone, siltstone, and shale. The goal of this project is to determine the mineralogy and compositional variation in these rocks. In addition, we attempt to explain the presence of gabbroic xenoliths found within the Lone Mountain dacite.

MESOSCOPIC ANALYSIS

The core of the mountain is composed of predominantly igneous dacite with the flanks of the mountain composed of moderately dipping sedimentary rocks. Samples were collected mainly along the southern, eastern, and northeastern sides of the mountain (Figure 1). Due to the presence of >3 feet of snow, much of the mountain was closed off due to possible avalanche threats.

Most samples of the Lone Mountain dacite contained hornblende and plagioclase crystals set in a fine-grain matrix or groundmass. The dacite intrusion is completely undeformed and possesses an original, igneous porphyritic texture. On the east side of the mountain at lower elevations, sedimentary strata is tilted with an average strike and dip of bedding being N33E/53NW. This unit consists of alternating layers of fine-grained, tan colored siltstone and white volcanic ash (Figure 2). A minor fault cutting this sedimentary sequence was observed and had an orientation of N33E/53NW. Beyond the intrusion zone, there was an outcrop with black siltstone, sandstone, and some more volcanic ash. This was at a higher elevation with a strike and dip of N20E/19SE. The alternating bedding measurements with units dipping towards the NW and SE suggest the sedimentary rocks were deformed into a broad anticline syncline structure, prior to the intrusion of the Lone Mountain dacite. Emplacement of the dacite may have additionally uplifted the surrounding sedimentary strata.

PETROGRAPHIC ANALYSIS

Dacite Intrusion

Samples were collected from the dacite intrusion along the on the east and southeast side of Lone Mountain (Figure 4). The matrix consists of an aphanitic to porphyritic texture. Samples analyzed contain minerals such as plagioclase + hornblende + biotite + quartz + opaques. Plagioclase occurs as subhedral phenocrysts within a finer grained groundmass. It exhibits albite twinning with grains approximately 1 -6 mm in size. Hornblende is found as subhedral crystals approximately 1-3 mm in size (Figures 5 and 6). Biotite crystals were found to be anhedral and only about 1-2 mm in size. Quartz occurs as anhedral grains with a much smaller grain size than that observed in plagioclase. Grain size typically varies between 1-2 mm. Figure 5 shows a representation of the distinct contact between the fine-grained dacite and a larger coarse-grained gabbroic xenolith. Figure 6 displays a fine-grained dacite with plagioclase, quartz, biotite, and hornblende minerals.

Gabbroic Xenoliths

Samples of dacite containing abundant mafic xenoliths were collected along the east and northeast side of Lone Mountain (Figure 1). The gabbroic xenoliths are found to be predominantly phaneritic in texture (Figure 7). Pyroxene is the most abundant mineral present and occurs as subhedral to anhedral grains 0.5-1 cm in size (Figure 8). Hornblende
occurs as 0.5 to 0.7 cm in size. Minor amounts of chlorite are also present as subhedral grains. Subhedral plagioclase crystals with albite twinning are present as 1-4 mm grains (Figure 9).

Two samples collected from the southeast side of Lone Mountain also contain coarse-grained xenoliths with similar mineralogy. Figure 10 shows exsolution textures in plagioclase grains. Minerals present include subhedral plagioclase, occurring as 4-6 mm in size, euhedral pyroxene, approximately 2-4 mm in size, and finally minimal quartz and biotite grains that were anhedral and only 1-2 mm in size.

Sedimentary Country Rocks

Several samples were collected from the sedimentary country rock in order to evaluate the effects of thermal metamorphism related to the intrusion of the Lone Mountain dacite (Figures 11-13). One sample was collected from an interlayered sequence of cross-bedded sandstone and shale. Petrographic analysis reveals a very fine-grained matrix with quartz, plagioclase, minor orthoclase, and opaque minerals. Grains were well rounded and moderate to moderately-sorted (Figures 12). Little petrographic evidence was observed indicating these rocks experienced any significant thermal effects.

A sample collected on the eastern side of Lone Mountain was composed almost entirely of fine-grained quartz with minor plagioclase feldspar. This quartz sandstone consists of angular grains approximately 1-3 mm in size (Figure 13). The furthest sample collected from the intrusion was a fine-grained sandstone composed almost entirely of rounded, anhedral quartz. Grains range in size from 1-2 mm and are cross-cut by quartz veins.

Ultramafic Rock

A small body of ultramafic rock was collected east of Lone Mountain at the lowest elevations. It contains plagioclase + hornblende + clinopyroxene + minor chlorite. Plagioclase has albite twinning and occurs as subhedral grains 2-4 mm in size. Hornblende is subhedral with clasts from 3-6 mm in size. Clinopyroxene grains are subhedral with clasts 2-7 mm in size. The minor chlorite is found around the edges of the plagioclase grains suggesting secondary alteration (Figure 14). The significance of this unit is beyond the scope of this project, but it could represent an even older phase of more mafic magmatism.

DISCUSSION

Based on petrographic analysis of 20 thin sections, it can be determined that the mineralogy of the Lone Mountain dacite contains plagioclase, hornblende, quartz, and biotite. The gabbroic xenoliths found within the dacite contain plagioclase, hornblende, and pyroxene. The igneous textures preserved in the dacite and xenoliths are distinguishable from one another. The dacite is mainly aphanitic to porphyritic whereas the xenolith is commonly phaneritic. On the basis of mineralogy, the Lone Mountain laccolith is classified compositionally as a dacite whereas the xenoliths are gabbros.

The question remains whether these gabbroic xenoliths represent an early magmatic differentiation from an initial magma, or if these xenoliths are an older plutonic rock later intruded by dacitic magma. Magmatic differentiation is the process in which magma can change composition by crystallizing and segregating different minerals over time, thus affecting the compositions of the residual magma. Some possible magmatic differentiation events that could have happened on Lone Mountain are assimilation; the mixing of two or more magmas; various degrees of partial melting from the same source; or two distinct melting events from two distinct sources.

On the basis of mineral assemblages, both the dacite and gabbro xenoliths are similar, with only minor differences suggesting they may in fact be genetically related. The next step in our project is to pursue a geochemical approach this upcoming year and investigate the chemistry of these rocks,
in an effort to determine if a genetic relation exists.

FUTURE WORK

During the fall 2005 and spring 2006 semesters I will be preparing samples for geochemical analysis. Samples of Lone Mountain dacite and gabbroic xenoliths will be analyzed for major and trace elements using x-ray fluorescence at Hartwick College in New York. The goal will be to determine bulk rock chemical signatures of the xenoliths and dacite, and see if they are similar. Similar chemical signatures, especially trace elements, would tend to support our hypothesis that the Lone Mountain dacite represents a magmatic differentiate of an initially mafic magma with the gabbroic xenoliths being the early crystallized phase.

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FIGURE 1: Portion of the a 7½ minute topographic map showing Lone Mountain and sample locations used in this study.

FIGURE 2: Photograph of deformed and tilted layers of alternating siltstone and volcanic ash layers in country rock adjacent to the Lone Mountain dacite intrusion.

FIGURE 3: Photograph of a coarse-grained conglomerate that is part of the Cretaceous-aged country rock intruded by the Lone Mountain dacite.

FIGURE 4: Photograph of typical open horseshoe pit exposure of dacite pluton.
FIGURE 5: Photomicrograph of fine-grained dacite and larger coarse-grained gabbroic xenolith within dacite intrusion.

FIGURE 6: Photomicrograph of fine-grained dacite that consists of plagioclase, quartz, biotite, and hornblende.

FIGURE 7: Photograph of mafic xenolith within a dacite rock.

FIGURE 8: Photomicrograph of coarse-grained gabbroic xenolith (left) and fine-grained dacite (right). Xenolith consists of mainly pyroxene and plagioclase, whereas dacitic rocks consist of plagioclase and hornblende with minor pyroxene.
FIGURE 9: Photomicrograph of a large plagioclase phenocryst within a sample of gabbroic xenolith (LM-4-04).

FIGURE 10: Photomicrograph of fine-grained plagioclase and larger hornblende phenocrysts.

FIGURE 11: Photomicrograph of the sedimentary country rock adjacent to the dacite intrusion. Angular shaped quartz grains are cut by brittle fractures from top left to lower right.
FIGURE 12: Photomicrograph of extremely fine-grained clay-rich matrix with rounded quartz, plagioclase, and opaque grains. Sample is from the sedimentary sandstone country rock.

FIGURE 13: Photomicrograph of a quartz vein cutting a quartz-rich siltstone of the country rock.

FIGURE 14: Photomicrograph of an ultramafic body that contains crystals of plagioclase (gray) and clinopyroxene (bright blue interference colors).
References Cited


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Abstract

The Narragansett Basin is a Pennsylvanian-age transtensional basin that formed within the Avalon Terrane approximately 320 Ma. The Narragansett Basin consists of different stratigraphic units, with the Rhode Island Formation being the most extensive (Towe, 1959). Following deposition and lithification, the Rhode Island Formation experienced several phases of intense deformation and metamorphism as a result of Africa colliding with the eastern margin of North America. The Alleghanian Orogeny created the supercontinent Pangea, culminating around 280 Ma (Winstch et al., 1992).

This project investigated the lithologic and microstructural characteristics of the lower portion of a 1500 foot deep drill core obtained along the eastern margin of the Narragansett Basin near Somerset, MA. The core consists of a sequence of alternating layers of sandstone and siltstone, with minor amounts of coal.

Microstructural analysis reveals evidence of both low temperature and higher temperature deformation episodes that affected the Rhode Island Formation. The low temperature episode is defined by a dominant pressure solution cleavage and locally developed pressure fibers. The presumably older, high temperature episode is dominated by crystal-plastic deformation that is preserved as statically recrystallized quartz. Mineral assemblages near the bottom of the core contain abundant biotite and biotite/chlorite pseudomorphs after garnet. This suggests metamorphic temperatures in excess of ~450-500°C for the lower portion of the core in agreement with the quartz microstructures.
Introduction

This paper examined the lower portion of a drill core from Somerset, MA (from a depth of 750 feet to a depth of 1500 feet) obtained along the eastern margin of the Narragansett Basin (Fig. 1). We document the microstructures preserved in rocks of the Rhode Island Formation and identify the types of deformation mechanisms that operated during an intense phase of the Alleghanian Orogeny. Rocks and minerals respond to deformation in various ways depending on the dominant deformation mechanism. By studying the microstructures we were able to decipher the type of mechanism(s) that operated during deformation and metamorphism. On the basis of the type of microstructures and mineral assemblages present, we can infer the temperature-pressure conditions that existed during this episode of deformation.

The predominant deformation mechanism was pressure solution. Pressure solution is a selective process that involves the dissolution, transport, and re-precipitation of material through an intergranular fluid, in response to high compressive stresses (Davis and Reynolds, 1996).

Surficial studies have documented the style of deformation that affected rock of the Narragansett Basin mainly in Rhode Island (e.g. Mosher et al., 1987). Mosher et al. (1987) showed that rocks in the southern portion of the Narragansett Basin in Rhode Island experienced intense deformation and high grade metamorphism.

Little attention has been paid to the rocks of the Narragansett Basin in eastern Massachusetts and in particular within the subsurface. Our results have helped to provide new information concerning the mechanisms and conditions of deformation and metamorphism that occurred during this intense period of tectonic activity. Ultimately our results will help refine current tectonic models for the geologic evolution of eastern Massachusetts.

Geologic setting

The Narragansett Basin is a Pennsylvanian-age basin that formed within a transtensional tectonic environment approximately 320 Ma (Fig. 1). The Narragansett Basin consists of a variety of lithostratigraphic units, of which the Rhode Island Formation is the most extensive in terms of thickness (Towe, 1959). The basin was a locus of sedimentation as material was transported from the northeast via rivers and streams. Deposition resulted in an accumulation of >15,000 feet of clastic sediment. Following deposition and lithification, the basin experienced several phases of intense deformation and metamorphism during the Alleghanian Orogeny. This event was a result of the collision between Africa and the eastern margin of North America, creating the supercontinent Pangaea, about 280 Ma (Winston et al., 1992).

Methodology

The drill core studied was extracted in Somerset, MA and is approximately 1500 feet in length. This research project concentrated on the lower 750 feet of drill core, while the upper 750 feet of drill core was examined by a fellow Bridgewater State College student, Ashlee Kirkwood. Lithologies were logged and a stratigraphic column was constructed that displays rock type and thickness versus depth (Fig. 2). During mesoscopic analysis, samples were selected for petrographic study based on their appearance and textures. Samples were cut using a diamond-tipped rock saw and trimmed into small rectangular chips. After being polished, these chips were sent to a commercial laboratory where they were mounted to glass slides and ground to a thickness of 30 microns.

Results

Mesoscopic Lithologic Analysis

The lower portion of the drill core contained a sequence of alternating layers of sandstone and siltstone, with minor amounts of coal (Fig. 2). Sedimentary bedding is inclined about
Figure 1. Generalized tectonostratigraphic map of eastern New England.
Figure 2 - Generalized stratigraphic column of Somerset drill core.
15-20° from the horizontal. Sandstone that is present is typically fine-grained with siltstone being extremely fine-grained. Thicknesses of individual units ranged from only inches to 10's or 100's of feet. Several calcite veins occur throughout the core and crosscut sedimentary layering at relatively high angles.

**Petrographic Analysis**

The following data reflects the mineralogy and microstructures obtained through petrographic analysis of samples that provide information pertaining to the geologic evolution of the Narragansett Basin; photomicrographs accompany the data to provide a visual example. XPL = crossed polarized light; PPL = plane polarized light.

**Sample SOM-56-1:**

This sample is a fine-grained, well sorted sandstone obtained from a depth of 872' that contains quartz and an abundance of opaque grains. Figure 3 shows an example of slaty cleavage and pressure fibers developed on an opaque grain.

**Sample SOM-83-1:**

This sample is a fine-grained, well sorted sandstone obtained from a depth of 1269' that contains quartz, muscovite, and biotite. Figure 4 shows an example of well-developed crenulation cleavage within the mica-rich layers, and considerably less within quartz-rich layers.

**Sample SOM-86-1:**

This sample is a very fine-grained siltstone obtained from a depth of 1317' that contains quartz, biotite, and opaque grains. Figure 5 shows pressure fibers surrounding an opaque grain which indicates low temperature metamorphism and deformation. Biotite is present in figure 6 which is generally indicative of higher temperature metamorphic conditions. Therefore, there may have been two distinct temperature changes or events that occurred to have both characteristics present in the same sample. One can infer that the rock was brought up to a very high temperature (~350°C - 500°C) at which the biotite began to grow and as the rocks were cooled the pressure fibers developed during compression.
Sample SOM-96-2:

This sample is a fine-grained, well sorted sandstone obtained from a depth of 1424' that contains quartz, biotite, and chlorite. Figure 7 shows chlorite pseudomorphs after garnet that also display an asymmetric shear fabric. In this sample the low temperature pressure solution overprints the high temperature fabric. Figure 8 shows chlorite and biotite after garnet. The presence of the pseudomorphs in both Figures 7 and 8 is indicative of retrogression following high temperature metamorphism.

Sample SOM-96-3:

This sample is a fine-grained, well sorted sandstone obtained from a depth of 1422' that contains quartz, biotite, clay, and opaque grains. Figure 9 shows a biotite skeleton that is breaking down, as well as parasitic folds. The folds bend around the biotite, indicating that the biotite was there first. One could infer that the biotite was originally a garnet and was later converted; after the rocks were heated up to a temperature where garnet could grow, they began to cool and the folds formed on the retrograde side of the cooling path.
Conclusion

The lower portion of the Somerset, MA core preserved evidence for two distinct thermal events. A high temperature metamorphic event that locally achieved garnet-grade conditions, and a low temperature deformation episode that is defined by locally developed pressure fibers and a dominant pressure solution cleavage.

After conducting a mesoscopic analysis of the drill core lithology and a detailed petrographic analysis of the mineralogy and microstructures we conclude that the lower portion of the core (from a depth of ~750 feet to a depth of 1500 feet) experienced both low temperature and high temperature deformation and metamorphism.

Low temperature deformation is identified by locally developed pressure fibers and the presence of a well-developed crenulation cleavage. The high temperature metamorphism is recognized by the abundance of biotite as well as biotite/chlorite pseudomorphs after garnet. In addition, the presence of statically recrystallized quartz also suggests elevated temperatures persisted after the high temperature metamorphism. The presence of garnet, a metamorphic mineral, suggests that temperatures in these rocks exceeded 450°C - 500°C.

The high temperature metamorphism is presumably older than the low temperature metamorphism. The relative ages of these events can be established on the basis of the preserved mineral assemblages and microstructures. The low temperature event records evidence of pressure solution and development of a crenulation cleavage. These features would most likely have been obliterated when subjected to higher temperatures. However, the biotite/chlorite pseudomorphs suggest temperatures were high enough to grow garnet and upon cooling retrograded to biotite/chlorite. It is unclear whether these events represent separate episodes of deformation and metamorphism or if they reflect a transition from high temperature metamorphism to lower temperatures during cooling, but continued deformation.

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