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MCNAIR SCHOLARS JOURNAL

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GEORGIA SOUTHERN
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Who is Ronald Ervin McNair?

Ronald E. McNair, the second African American to fly in space, was born on October 12, 1950 in Lake City, South Carolina. He attended North Carolina A&T State University where he graduated Magna Cum Laude with a B.S. degree in physics in 1971. McNair then enrolled in the prestigious Massachusetts Institute of Technology. In 1976, at the age 26, he earned his Ph. D. in physics. McNair soon became a recognized expert in laser physics while working as a staff physicist with Hughes Research Laboratory. He was selected by NASA for the space shuttle program in 1978 and was a mission specialist aboard in the 1984 flight of the USS Challenger space shuttle.

After his death in the USS Challenger space shuttle accident in January 1986, members of Congress provided funding for the Ronald E. McNair Post-Baccalaureate Achievement Program. The goal is to encourage low-income, first generation students, as well as students who are traditionally under-represented in graduate schools, to expand their opportunities by pursuing doctoral studies.

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Director's Message



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January 29, 2001

Dear *McNair Research Journal* Reader:

The Georgia Southern University Ronald E. McNair Post-Baccalaureate Achievement Program is pleased to present this inaugural issue of the *McNair Research Journal*. This scholarly work contains the collective efforts of our first cohort of McNair Scholars who participated in the McNair Program Summer Research Institute, May 29 through June 30, 2000. The McNair Program began at Georgia Southern University on October 1, 2000 with the formal notification of the grant award from the U. S. Department of Education in the amount of \$760,000.00 for four years. Since that time, the program has enjoyed several important milestones such as the identification and selection of McNair participants, staff, and faculty mentors, and the development and implementation of activities designed to promote doctoral studies for undergraduate students.

I am indebted to a number of Georgia Southern University individuals who have helped to shape the direction of the program. First, Mrs. Angela Calhoun Carlyle, the first Coordinator of the McNair Program, did a great job setting the tone for the program. She guided the program from its inception to its present reality by formulating a dynamic set of goals, establishing priorities, and resources to address the objectives of the program. Second, I acknowledge the work of Mrs. Peggy Morgan, Secretary/Data Clerk for the McNair Program, faculty mentors, and the McNair Advisory Council members and a host of other University faculty and staff. They are to be commended for their dedication, and support over the past year. I appreciate Dr. Lane Van Tassell, Associate Vice President for Academic Affairs and Dean of Graduate Studies and Dr. John Diebolt, Associate Dean of Graduate Studies, and their staffs who have demonstrated a spirit of collaboration and cooperation that has been unequalled. Finally, I gratefully acknowledge the work of Ms. Hyeyoung Lee, Graduate Assistant in the Office of Graduate School Admissions for her organization, and design of this journal.

You are invited to comment, or make suggestions that may help to improve future issues of the *McNair Research Journal*. Direct any inquiries to me at (912) 486-7731 or via email at
Enjoy this inaugural issue of the *McNair Research Journal*.

Sincerely yours,

Randy Gunter, Ph. D.
Acting Associate Vice President for Student Affairs

Relationship Between a Precipitate Found in Ethanol Preserved Crustaceans and The Molt Cycle

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McNair Scholar

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pre-molt, freshwater and terrestrial crustaceans degrade their old exoskeletons, freeing up calcium in the blood stream before delivering it for storage in the stomach. Calcium is insoluble in ethanol. Thus, it is believed that if a freshwater or terrestrial crab is preserved during the pre-molt stage of its

stage specimens before preserving them, it simply addresses an enigma that has remained unsolved, even though alcohol has been used as a preservative since the mid-17th century. Further testing is needed to determine a suitable alternative to ethanol preservation for pre-molt



Abstract:

This study investigates the identity and cause of a mysterious white precipitate that sometimes forms on crustacean specimens preserved in ethanol. Although the appearance of the precipitate is rare, it is much more common on terrestrial and freshwater specimens than on marine. This experiment proposes that the precipitate is calcium, or a calcium complex, linked to the development and degradation of the exoskeleton during the molt cycle. The molt cycle is divided into four stages, molt, post-molt, inter-molt, and pre-molt. During the

molt cycle the free calcium will form a precipitate on the exterior of the crustacean. To test this hypothesis, fiddler crabs, *Uca pugilator*, were stimulated into a precocious molt by the removal of six of their walking legs. Care was taken to see that the crabs progressed to the different stages in their molt cycle. 20 individuals were preserved at each stage in 70% ethanol. Results confirmed the formation of the white precipitate in pre-molt fiddlers, and the lack of the latter in the inter-molt specimens. This study does not suggest that curators or scientists molt

freshwater and terrestrial decapods, and the possible correlation between calcium precipitates on decapods specimens and other crustaceans.

Introduction

There should be no question as to the physical difference between the two crabs in the picture above. Yet, as obvious as the precipitate encrusting the right crab is, most scientists in the field of carcinology do not know this condition even exists. The reason that many scientists are unaware that this formation may coat some

specimens of crustaceans is because it is so rare. The few who have encountered the precipitate have assumed it to be the result of mineral deposits in hard water, the failure to cleanse a specimen before preservation, or even the mixing of seawater and ethanol. None of these hypotheses has ever been formally investigated, but one preliminary study, meant to determine exactly how rare this precipitate is, found an interesting relationship among the small number of jars containing the precipitate (Harvey, pers.obs.).

require the recycling of calcium from their old exoskeletons.

The exoskeleton of decapods is composed of calcium carbonate in the form of calcite or poorly crystalline, amorphous calcium carbonate, which provides the structure's rigidity (Green and Neff, 1972; Greenaway, 1985; Roer and Dillaman, 1984; Skinner, 1962). Crustacean growth is constrained by this rigid exoskeleton. So, in order for the animals to increase their size they must discard their old shell for a brief period in which time the uptake of water

crustaceans acquire sufficient amounts of Ca from the ocean's high concentration of CaCO_3 , making it unnecessary to recycle their old shells (Neufeld and Cameron, 1993). Table I shows the terrestrial and freshwater crab's degradation and deposition of calcium that correlates with the different stages in its molt cycle. What is important to note from the table is that calcium is freed from the exoskeleton during the early pre-molt period, and reaches its peak concentration in the haemolymph just before ecdysis, the molt. The stages

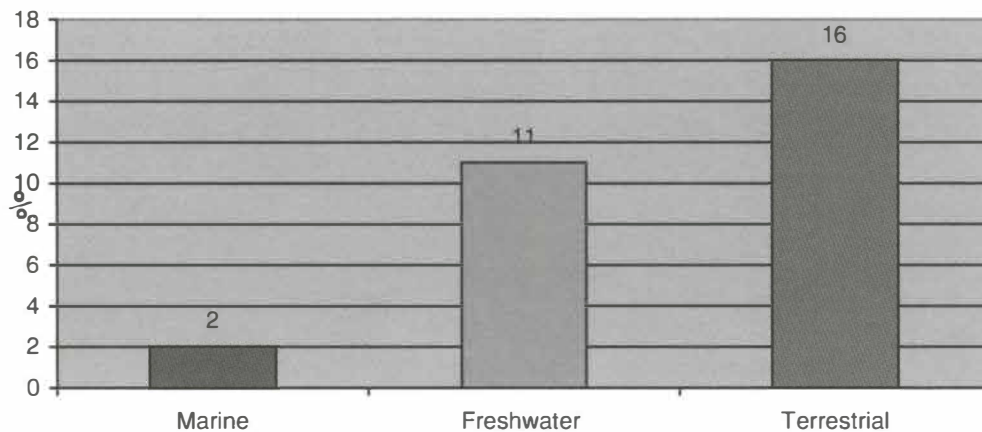


Fig1. The frequency of precipitate formed on decapods specimens preserved in 70% ethanol. Results of preliminary study done at the American Museum of Natural History.

Figure I shows the relationship between the percentages of jars found with the precipitate and the habitats from which the specimens were taken. More importantly than the rarity of the phenomena, these numbers indicate the tendency for the precipitate to occur more often in freshwater and terrestrial decapods than in marine. The most logical link between these species' environments, in relation to this project, that differentiates them from marine decapods, is that they

and air expands the animal's tissues. The outer layers of the new exoskeleton re-harden within a few days, and the animal resumes its normal lifestyle. Drach (1939) was the first to distinguish and describe these stages that were to become known as the crustacean's molt cycle.

As mentioned before, freshwater and terrestrial decapods must rely on a recycling system to provide the necessary calcium that their environment lacks (Greenaway, 1985). Marine

surrounding the molt, D, E, A, and B, account for only 34% of the animal's cycle. The remaining 66% of the crab's molt cycle, the inter-molt, maintains the calcium of the animal as mineral salts, and crystals, or as spherules surrounded by bound lipoproteins (Greenaway, 1985; Roer and Dillaman, 1984).

Although it is not completely understood, there is a relationship between bound lipids and tissue metabolism (Roer and Dillaman, 1984).

Table I. The separate stages of the crustacean molt cycle as they correlate to calcium resorption and deposition.

<u>STAGE</u>	<u>EVENT</u>	<u>Calcium Characteristics</u>
D ₀ -D ₁	Early Pre-molt	Resorption of ¾ of old exoskeleton. Calcium is delivered via blood for storage as gastroliths in the stomach lining (Greenaway, 1985, and Skinner, 1962).
D ₂ -D ₄	Late Pre-molt	Peak concentration of Ca in haemolymph, simultaneous increase in amount of organic material (Greenaway, 1985).
E	Molt	Brief period of inactivity as exoskeleton is shed. Calcium of shell is lost, unless later eaten by crab.
A	Early Post-molt	Dissolution of Ca deposits. Rapid calcification and tanning of exocuticle (Green and Neff, 1972). Decrease of Ca in blood (Neufeld and Cameron, 1993).
B	Late Post-molt	Continued deposition of stored Ca until all is utilized. Use of external sources for Ca supplement.
C	Inter-molt	Exoskeleton is fully calcified and animal is in equilibrium with its environment's calcium concentration.

As mentioned above, there is an abundance of free calcium during the pre-molt stage. An abundance of organic material is also freed up by the degradation of intraepidermal connective tissue, and the production of cuticular secreting cells (Green and Neff, 1972). Lipoproteins are freed from the degraded epicuticle, and connective tissue (Roer and Dillaman, 1984; Skinner, 1962). Lipids are easily dissolved in organic solutions, such as 70% ethanol. Lipids are even more easily withdrawn from a substrate when bound to calcium (Berenbaum, 1958).

Hypothesis

The unknown precipitate that forms on crustacean specimens preserved in 70% ethanol is the element calcium, possibly in the form of calcium carbonate, which is freed up during the pre-molt stage of freshwater and terrestrial decapod's molt cycles. The calcium binds with lipids, which are soluble in ethanol, and as the lipids

dissociate, the calcium is pulled into the external environment of ethanol, where it is insoluble.

Materials and Methods

The experimental animal, the sand fiddler crab or *Uca Pugilator*, was collected from the marshes of Glynn County, Georgia. These crabs are terrestrial, but they live in close contact with the ocean. A precocious molt was induced in male fiddler crabs by the autotomy of six walking legs (Skinner, 1962; Skinner and Holland, 1976; Vigh and Fingerman, 1985). Autotomy is a neural response that releases injured limbs without severe repercussions to the animal. The regenerating limbs grow out as buds that can be measured, along with the carapace width, to determine the molt stage of the animal. The equation

$$\frac{\text{Bud length}}{\text{carapace width}} \times 100 =$$

gives the 'R' value that correlates with the appropriate molt stage of the animal (Bliss,

1956). As the animals approached the four different stages D₀-D₁, D₂-D₄, A, and B, individuals were selected until twenty specimens of each stage were preserved in 70% ethanol.

Atomic absorbency was used to determine the calcium concentration of the precipitate. Due to a lack of time and the small amount of precipitate that formed from *Uca pugilator* specimens, a precipitate sample was scraped from two large hermit crab specimens on loan from the Harvard collection. The precipitate was dried and tested for calcium concentration.

Results

1. *Precipitate Formation*

The recreation of the unknown precipitate was successful in the laboratory setting. Although all of the specimens have not been preserved at this time, it is clear that the precipitate is a direct result of the morphological changes that occur during the pre-molt.

Table II. Frequency of precipitate in Crustacean molt stages

Stage	# of Specimens	# With Precipitate	% W/Precipitate
A	12	0	0%
B	20	1	5.3%
C	20	0	0%
D0-D1	28	22	79%
D2-D4	16	15	94%

Table II shows the percentages of specimens that formed the precipitate.

The precipitate became visible as quickly as one hour after specimens were preserved. The amount of substance formed varied, but it consistently formed on the setae and major cheliped of each crab. There were some specimens with additional amounts of the precipitate on the bottom of the jar. Early post-molt crabs, with the exception of one, showed no precipitate, but several of these specimens had small portions of insoluble material floating at the top of the jar. This material is believed to be tissue or fluid that escaped from animals whose carapace or abdomen had come unattached.

2. Atomic Absorbency Spectroscopy

The atomic absorbency spectroscopy conducted for this experiment confirmed the presence of calcium, but due to an error while recording the standard values, the concentration of calcium in the precipitate was not found.

Work in Progress

Further studies are needed to determine the exact concentration of calcium, per gram of precipitate. Atomic absorbency or atomic emission

spectroscopy will be used to determine the amount of calcium forming on the outside of the pre-molt animals. Paraffin smears or chemical analysis will be used to determine the amount of organic material bound in the precipitate. With these results, further conclusions can be drawn about the cause of the precipitate.

In the fall of 2000, data analysis will be taken from the Smithsonian Museum's crustacean collection in order to have a formal review of the percentages of animals forming the precipitate. This information will allow confirmation of earlier reports of the precipitate's abundance. If time allows, other crustacean specimens, such as Isopods, will also be examined to determine if there is a possible correlation between the precipitate and calcium-storing crustaceans.

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Main Influences of Perceived Gender Differences in Middle and High School Students: Unveiling the Curtain of Silence

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Abstract:

The present study, continuing a recent research trend, examined multiple influences on gender differences. The focus in this study is on the main influences that affect the way boys and girls perceive gender differences, especially among middle and high school students. The study included a survey of rural Georgia students from a variety of backgrounds. The survey was conducted in homeroom and history classes. Respondents ranged in age from eleven to eighteen, with the average age of fourteen. Since previous research indicated that there is disagreement among scholars on influences affecting perceived gender differences, this study provided direction for future research.

Introduction:

This project shall differ from many others in that the end result is the beginning of the research. I am a product of my home, culture, and environment, which makes the subject of my research matter more difficult for analysis and review without discovering bias. As a woman, I have had stereotypical beliefs instilled in my self-concept. This leads me to ask if I am the way that I am because of my experiences and values and because I have been culturally influenced in order to fulfill societal stereotyping as a female. Being an education major, I have continued to explore my fascination with adolescent behavior, and why children have particular belief systems, especially about sex role stereotypes. It was for this reason that I was determined to study the main influences on perceived gender differences in girls and boys. I elected to focus on middle and high school students because these ages are key ages in individual development. Yet, there are various factors that influence these perceptions on gender schema. I wanted to travel beyond the gender stereotype box that implies that boys believe themselves to be better at math. I wanted to seek enlightenment on the more minute and harmful gender stereotypes that are longer lasting and more widespread in various schools. Not only did I desire to find out who is that girl, and who is that boy, I wanted to research why that girl and that boy have these perceived gender beliefs. Being in a school setting during the Fall of 2000, will enable me

to continue both the quantitative and qualitative aspects of my study, in which I select and interview students who may help me understand where their beliefs originate. Research has informed us as to what to expect as cultural gender differences, but not how students perceive the main influences on their own gender schemas.

The time spent as a McNair scholar has given me a unique prospective on the various beliefs regarding gender from my panel of peers. The females in my group have the same determination and self-concept as the males with respect to scholastic success. This has made me curious as to whether they have always held these beliefs and what has influenced these beliefs. If these beliefs are in fact changeable, then those who influence adolescents have a social and personal obligation to navigate these children toward a more androgynous role or less biased role.

Literature Review:

Perceived gender differences play a vital role in adult socialization and often work as an ingredient in a recipe that creates success or failure in relationships, and in life experiences. Therefore, if the influences on these gender perceived differences can be clearly identified, changes in thinking and child rearing (inside and outside the educational setting) might be considered that could positively affect relationships and experiences that are influenced by set role stereotyping. Ideally, adults could develop their fullest

potential with little or no regard to what stereotyping says they should be. Perceived Gender Differences Among Middle School and High School Students

The foundation of understanding the effectiveness of taught gender difference is understanding what encompasses perceived gender differences. Directly through teaching, open statements or indirectly through actions taken or observed, sex role differences are perceived early and continuously in the life of a child. Gender differences are created by gender schemas that society reflects (Bem, 1994; Carter & Levy, 1991; Jacklin, 1989; Meehan, 1992/1993). Gender schemas refer to a body of knowledge of diverse information that a child acquires about gender (see Bem, 1994; Carter & Leevy, 1991; Jacklin, 1989; Meehan, 1992, 1993). "This information includes beliefs that link certain behaviors, attitudes, and feelings with each sex" (Jacklin, 1989, p.134). Gender schemas consist of previous experiences, what the child has been taught, and gender stereotypes that continue to surface from generation to generation, even in the midst of social change. Such cultural messages being sent would suggest that females would make better teachers due to their inert nurturing skills. These stereotypes are "culturally shared expectations about gender differences in personality traits, abilities, and appropriate behaviors prescribing how each sex ought to perform" (Bullen, Collis, & Ollilia, 1989, p. 123). Bem (1974) believes that the notion of strong versus weak is absent in the gender schema that is taught to girls, while the gender schema that is applied to boys misses the dimension of nurturance. This study will examine the influences that affect

gender role schema development in adolescents, how adolescents perceive these influences, and to what extent these schemas may be further influenced (Meehan, 1992/1993).

In order to determine the most recent ideas regarding perceived gender differences in children, several studies and surveys have investigated gender identity. One particularly well-known instrument is the Bem Sex Role Inventory (BSRI) (Bem, 1974), an assessment that attempts to indicate the degree to which a person is culturally influenced by gender roles. More recent are studies performed to reflect how children actively perceive gender difference while going through the process of developing gender schemas. Trepanier-Street and Romatowski (1986) studied children's creative literature (grades 1-12) in order to determine how possible gender differences were manifested. They found that boys were more likely to characterize themselves as animals that are strong, dangerous, or wild. Conversely, girls tended to choose animals that are weak, safe, or domestic. Students were given an androgynous premier sentence from which to write creative literature. This story starter was structured so that the researchers could determine whether either sex would write differently about the same sex versus the opposite sex. From Trepanier-Street and Romatowski's study of 85 participants, only three female characters in the males' writings were assigned professions: two teachers and a witch. Trepanier-Street and Romatowski found that stereotypical thinking did exist among the students. Students (at every grade), both male and female, tended to have the male character lead the problem solving more independently than the female character. This study

also discovered that by sixth grade, gender stereotypes peaked, and the stereotype of boys being independent, competent, and dominant and girls as dependent, passive, and nurturing only became more entrenched in males as their ages increased. The use of violence in male created stories increased thirty-four percent from grades three to six. In contrast, female violence inclusion in writing increased thirty-five percent. The initiators of the violence in all circumstances were men. This indicated that both sexes internalized men having positions of power (mental and physical) by grade six. Children's writing across grade level suggested that sex role stereotype schema manifested early and continued to change moving from more androgynous notions in earlier grades to more distinct manifestations of change in later grades. Development of Perceived Gender Differences

Gender differences among middle and high school students are developed at an early age (Witt, 1997). As children grow and develop, the gender stereotypes that they are exposed to at home are reinforced by other elements in their environment and are thus continued throughout childhood and on into adolescence (Martin, Wood, & Little, 1990). A child's self-concept is a result of the multiple ideas, attitudes, behaviors, and beliefs to which he or she is exposed (Santrock, 1994). Many of these beliefs that the child faces date back to the nineteenth century. According to the Victorian ideal of separate spheres (Coltrane, 1997), frail but morally pure women found true fulfillment in their domestic roles as wives and mothers, and rugged men left home to earn a family wage. The ideal woman was supposed to tend children and

humanize husbands, providing them respite from the cruel and competitive world beyond the home (Coltrane, 1997). Even though actively teaching this ideal to children seems harmful and difficult, its romantic imagery is manifested in literature and society. This is what passes on to children (Witt, 1997). Through a myriad of activities, opportunities, encouragement, discouragement, overt behaviors, covert suggestions, and various forms of guidance, children experience the process of gender role socialization (Witt, 1997). Through parental influence, peers, school, and media, children learn gender stereotyped behavior (Alfieri, Higgings, & Ruble, 1997; Basow, 1992; Witt, 1997). As the child grows, these beliefs become enriched truths, in which the child will deny the reality of what he or she are seeing when it does not conform to their gender expectations (i.e., a child whose mother is a doctor but indirectly infers that only men are doctors) (Sheldon, 1990). Differentiation in gender beliefs decrease with age into early adolescence, but then increases again during late adolescence. This makes the transition to middle school significant because this is the point when gender difference seems powerful, as opposed to early development during elementary grades (Alfieri, Ruble, & Higgins, 1996).

The perceived gender influences on children have been shown to be biological, parental, and social (Alfieri, Ruble, and Higgings, 1996; Bem, 1974; Witt, 1997). Many of these studies indicate that the main influence on gender role identification is the parent (Witt, 1997). According to Bem (1974), gender expression is formed by both biological development and culture. The greatest influence of

gender role development occurs within the family setting, with parents passing on, both overtly and covertly, their own beliefs about gender (Witt, 1997). Thus, my research shall focus on cultural influences, particularly parental and social. A child's earliest exposure to what it means to be male or female comes from parents (Kaplan, 1991; Lauer & Lauer, 1994; Santrock, 1994). Before the moment of conception, parents treat sons and daughters differently, buying gender-specific clothing, gender-differentiated toys, and expecting different behavior from boys and girls (Throne, 1993). Parents encourage their sons and daughters to participate in sex-typed activities, such as doll playing and engaging in housekeeping activities for girls and playing with trucks and engaging in sports activities for boys (Eccles, Jacobs, & Harold, 1990). Children's toy preference is also altered due to parental sex-typing (Etaugh & Liss, 1992; Henshaw, Kelly & Gratton, 1992; Paretto & Sydney, 1984), with parents providing gender-differentiated toys and rewarding play behavior that is gender stereotyped (Carter, 1987). Boys are more likely to have maintenance chores such as painting and mowing the lawn, while girls are more likely to have domestic chores such as cooking and doing the laundry (Basow, 1992). This distribution of chores only leads children to perceive certain types of work as gender related. While both parents contribute to gender stereotyping, fathers have been found to reinforce gender stereotypes more often than mothers, independent to the sex of the child (Ruble, 1988). Males have an advantage as far as parental preference for children is concerned, preferring male children (Basow, 1992). The

preference for male children is more magnified by the finding that parents are more likely to continue producing children if they have only girls as opposed to initially having boys (Hoffman, 1977). This preference is linked to the previously discussed Victorian ideal. Reasons for preference from women included having sons to please their husbands, to carry on a family name, and to be a companion for their husband (Hoffman, 1977).

It is important to note that not all research leads to the conclusion that parents are the greatest influence on gender difference. Some studies have suggested that parental shaping as a socializing factor has little impact on a child's sex role development (Lytton & Romney, 1991; Maccoby & Jacklin, 1980). On the other hand, other studies suggest that parents are the primary influence on gender role development during the early years of life (Ballard-Reish & Newman, 1993; Kaplan, 1991; Miller and Lane as cited in Berryman-Fink,; Santrock, 1994). In any circumstance, this process of self-identification is a two-way interaction, requiring reciprocation on both sides, including parent and child (Santrock, 1994). Also, development is influenced by many social factors, and children may best be understood in terms of their environment (Bronfenbrenner, Alvarz, and Henderson, 1984).

Other powerful influences are peers in and out of the school environment. In the educational setting, students have a wider variety of peers and begin to form new gender-related behavior such as dating. It is in this setting that previous attitudes may be challenged with introductions to various cultures with differentiating opinions on gender roles such as racial,

religious, and homosexual. As children are in school, they enter life phases that are important for changes in gender beliefs (Higgins and Parsons, 1983). Clearly, parental shaping is an important factor among a number of factors. It is also clear that as children move to adolescence other factors increase their effect, especially peer shaping. One of the goals of this project is to determine to what extent adolescents understand these influences and how these influences elicit changes in their beliefs.

To determine exactly when influences on gender differences are first perceived would be difficult, if not impossible. One study indicated that parents have different expectations and goals for sons and daughter within 24 hours after birth (Rubin, Provenzano, & Luria, 1974). Children interpret the messages from their parents regarding gender as early as two years of age (Weinraub, Jaeger, & Hoffman, 1984). Other studies found that children of two and a half years of age used gender stereotypes to negotiate and manipulate various activities, objects, and occupations (Cowan & Hoffman, 1986; Fagot, Leinbach, & O'Boyle, 1992). These studies suggest that children's familial surroundings only encourage gender stereotypical messages. From birth until adulthood, studies show that girls' rooms tend to have more pink, doll, and manipulative toys; boys' rooms have more blue, sports equipment, tools, and vehicles (Pomerleau, Bolduc, Malcuit, & Cosette, 1992). By the time the child reaches late adolescence, the effects of gender differences and gender stereotypes have created a well-constructed schema that is difficult to alter, even when challenging

circumstances arise to sway the previous knowledge. Since gender stereotypes and "rules" are established in early childhood, messages about what is appropriate based on sex role strong, that even when children and adults are exposed to different attitudes and experiences, they still revert to earlier gender stereotyped choices (Haslett, Geis, & Carter, 1992). Parental influence and attitudes appear to have the strongest impact on a child's developing sense of gender, gender difference, and self-esteem, with parental warmth and support of actions being the key factors (Richards, Gitelson, Peterson, & Hartig, 1991). However, subtle messages sent by parents regarding gender and what is acceptable for each is often challenged by direct messages sent by peers in adolescence (Alfieri, Higgins, & Ruble, 1996). The most influential presence in this circumstance regresses to the strength of the parental influence during developmental years (Arliss, 1991). The parental influence regarding perceived gender difference appears to be the most permanent because the parent-child relationship has effects on development that last well into adulthood (Berryman-Fink, 1993).

As children move through elementary school holding largely parental shaped gender schemas, emergence into adolescence begins with peer shaped schemas gaining influence. Literature has shown that 8th graders held more flexible beliefs regarding characteristics about gender. In contrast, other researchers have suggested that gender-related flexibility decreases as a child enters adolescence (Galambos, Almeida, & Peterson, 1990; Guttentag & Longfellow, 1977;

Hill & Lynch, 1983). Middle and high school students have been chosen for this research project because middle school sets the beginning of adolescence, which demarks the range of years where peers become the dominant influence. The transition from elementary to middle school is likely to be an important life phase for changes in gender beliefs (Higgins & Parsons, 1983; Meece, 1987). These two groups reflect the majority of the adolescent population and are the most responsive to influence from various peer factors during this period. In three studies examining beliefs about gender difference, 7th and 8th graders were more flexible or open, where as older, high-school-aged adolescents were more rigid (Sigelman, Carr, & Begley, 1986; Ullian, 1986; Urberg, 1979). Other studies represent similar findings. For example, Simmons and Blyth (1987) found a decrease in gender cross-over behavior in adolescents between the grades 6th and 10th. This indicates that traditional, stereotyped gender behavior increases during early to late adolescence.

The reasoning for this change of perception of gender roles can include various factors. One explanation by Galambos (1990) was that the onset of the pubertal status signals both a biological and cultural change. The onset of pressure on individuals to be attractive as sexual relationships begin is the main reasons for the rigid differences between the sexes (Eccles, 1987; Hill & Lynch, 1983). Changes in social structure are likely to also explain the flexibility of gender beliefs. This transition includes having more male teachers, wider variety of peers and opinions, and the beginning of dating (Alfieri, Higgins, & Ruble, 1996).

Differentiation in gender beliefs decrease with age into early adolescence but increase again into late adolescence (Alfieri, Higgins, & Ruble, 1996). Flexible beliefs of middle school students would indicate that the most receptive time period to affect gender beliefs is the beginning of middle school. Effects of Perceived Gender Differences

There may be some positive effects to adhering to strict gender role stereotyping among them providing a sense of security and facilitating decision-making. There are also costs involved in creating this curtain of illusion. These costs are in the limiting of opportunities for both boys and girls, ignoring talent, and perpetuating unfairness in our society (Beal, 1994). It is for this reason that women are seen as self-sacrificing and emotionally sensitive, making them ideal for childcare, serving men, and keeping house. Men, in contrast, are to be seen competitive protectors and providers, enabling them to ensure their rightful position as "head of household" (Coltrane, 1997). Society lately has provided easier opportunities for females to cross the gender line and play with trucks, wear pants, and get dirty. Such androgynous play has led to more androgynous individuals who have been found to have a higher self-esteem (Heilbrun, 1981; Lundy & Rosenberg, 1987; Shaw, 1983), and more flexibility in dating and love relationships (DeLucia, 1987). Families with one or more androgynous parents, have been found to score highest in parental warmth and support (Sedney, 1977; Spence & Helmreich, 1980). However, boys face negative responses and are labeled sissies if they cry, retreat from aggression, play with dolls, or manifest feminine characteristics (Hetherington and

Parke, 1986. Students who overcome certain beliefs appear to favor a more androgynous role where there may be repercussions to face such as labeling and isolation from peers. A review of the literature has determined the major influences on sex role stereotyping and their effects. This review has also noted the flexibility of these beliefs and boundaries and has outlined a need for further research in pushing the boundaries of these beliefs to determine if sex role stereotypical beliefs in middle and high school grades might be positively influenced. The focus of this project is to determine if middle and high school students understand the source of their own gender beliefs and if these beliefs have changed. This study will identify through the Bem Sex Role Inventory, a broad cross section of middle and high school students and their beliefs to determine how rigid sex role stereotyping is and to examine the flexibility of these beliefs.

Research Questions:

1. What are the culturally perceived gender differences among middle and high school students?
2. What are the influences on these perceived differences?
3. What are the results of a gender role survey (traditional, median, androgynous) on a select group of Southeastern middle and high school students?
4. How openly do students acknowledge stereotypical gender roles?
5. Are gender roles changeable in adolescent students?
6. What do adolescents perceive as the main influence for their own gender beliefs?
7. Are there other environmental factors that influence perceived adolescent's gender beliefs?
8. Are there differences in the influences on traditional, rigid

adolescent beliefs as opposed to the beliefs of more androgynous students?

Research Method:

In phase one of this project, the Bem Sex Role Inventory (Bem, 1974) will be administered to a sample of middle and high school students at my student teaching site in the Fall of 2000. I will test those students to which I have direct access. The BSRI test is an indirect measure of gender identity and attempts to indicate the degree to which a person's gender roles are culturally influenced. The BSRI will be administered according to the test manual. The BSRI is a psychometrically acknowledged instrument with strong reliability. The BSRI will be used to identify three students who reflect three distinct places on the sex role continuum. One student will be chosen from the low or androgynous level, one from the median level, and one from the high or distinct sex role level. These students will be the focus of phase two of the project, the qualitative aspect. The BSRI is a widely used psychometrically acceptable measurer of sex role identification. Instrument

The BSRI is the product of Sandra Lipsitz Bem. This test attempts to indicate the degree to which a person is culturally influenced by gender roles. The participant responds to a list of various gender-influenced characteristics on a scale ranging from one to seven (See Table 1). One represents never or almost never true, while seven is significant to always or almost always true.

The semi-structured interview that shall follow is based to obtain student perceived influences on their gender schema. There will be three sets

of questions. The first five questions will solicit demographic information: schooling, race, age, socio-economic status, and parents in household. The next set of questions will be based on how the students responded on the BSRI. I will ask each student who reported a one or a seven on any item on the BSRI. If a student responded to number one, "self reliant" by indicating a 1 (never or almost never true) or a 7 (always or almost always true). I will follow up with these questions.

1. Why do you think you are very or not very self-reliant?
2. Has anyone ever told you that you were very or not very self-reliant?
3. Have you always been very or not very self-reliant?

The final set of interview questions will explore gender role beliefs.

1. What are gender beliefs?
2. What are your gender beliefs?
3. Have you always held these beliefs or have they changed?
4. Who has been the most influential on your beliefs?

Data Collection:

These semi-structured, audiotape interviews are planned for each of the three students. The initial interview will be to explain the project, answer questions and gather demographic data: age, schooling, sex, family background, socio-economic status, and race.

The second and third interviews will explore students' responses on the BSRI in order to determine where the influences for the responses originate.

Finally, students will also be asked to initialize a

journal writing exercise. This exercise is based on a study by Trepanier-Street and Romatowski (1986), in which students were given an androgynous writing prompt of: "Her/His first thought as s/he woke up was, "Today is the day." And "S/He looked around to see what made the noise""(Schlegel & Schlegel, 1996). "The relation between thought and word is a living process; thought is born through words" (Shuman, 1990, p.90). Second, by examining the creative literature of the students in my study, I shall obtain a better understanding of the schemas that create wide development of gender-stereotyped behaviors in our society.

Additionally, I will keep field notes of the interviews and student writing samples.

Data Analysis:

Data sources will be used to focus on perceptions and continual factors affecting gender schema development. Data will be annotated, sorted, categorized and themes will be "triangulated" in order to present the data from different perspectives (Denzin, 1978). Data will then be used to examine the constructs of each research question. For the BSRI, raw scores will be used to classify students into three categories based on BSRI guidelines reported in the test manual. The three BSRI categories will be cross-tabulated with conjunction of select demographic characteristics. For example, in number 8 of the BSRI, respondents are asked to note how characteristics describe you on a scale. Number eight is shy. The purpose for the semi-structured interview is to determine whether or not one subject understands and can relate

the origin of this influence on shyness. Qualitative data (e.g. interview notes) will be content analyzed for trends and patterns. Anticipated Results

After indicating which students represent the low, median, and high range of gender beliefs from the BSRI, and selecting three students for further study, I believe that my results will present the findings of my literary review. I anticipate to find that gender role beliefs shall become more rigid and permanent as a child continues into late adolescents. If this were so, the turning point for change in the individual would be during the middle school grades. This creates opportunities for school systems to potentially alter the beliefs of the students toward a more androgynous role for greater success of the student. I expect to find that the majority of androgynous individuals have a working mother in the household, with parents who have strong egalitarian values (Weisner & Wilson-Mitchell, 1990). From the demographics from these interviews, I anticipate to find that race, sex, and socio-economic status also reflect the parental influence, which I determine to be the greatest early influence of the child. However, this study potentially shall manifest that peer influence has the most strength and power to deter a child from prior beliefs. This effect is only temporary, as I expect the students to regress to their primary influence's beliefs once outside the peer influenced setting. Through qualitative analysis, I shall further explore the isolation and mimicking of those who dare to cross the gender-line.

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The Sagittal Suture in Homo Sapiens: Is It Fractal?

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Abstract:

Growth patterns of cranial sutures are poorly understood. The amount of information necessary to dictate the spatial position and function of every cell is more than can be possibly stored by DNA. Current research suggests that the pattern of some biological structures are fractal or self-similar. Data was collected from 107 skulls of the Terry collection at the Smithsonian Institute. A digitizing pen was employed to trace the sagittal suture, producing S, Y, and Z coordinates. Utilizing a computer program (mathematica) the data will be analyzed to determine the fractal nature of the suture.

Introduction

Biologic structures attest to the complexity of nature, for example, the outline of a tree or a coastline. In particular, the sagittal suture of modern Homo sapiens presents a brilliant example. What is at the root of this unique growth pattern? How can it be measured? Growth of cranial vault bones (those that encase the brain) and their joints (sutures) is poorly understood. It has been suggested that the complexity of certain anatomical structures is far greater than what could be determined by specific genetic instruction and that this complexity is not simply the result of random growth. Therefore, rather than having a gene that codes for each particular feature of say, the branching structure of arteries, some believe there might exist a general set of parameters with which cells work. More specifically, some argue that the set of parameters could be described by fractal analysis (Liebovitch, 1998).

A fractal is an irregular, non-linear object that has a fractal dimension, and is at the core of a relatively new form of math that seeks to explain complex geometric forms (Goldberger and West, 1987; Mandelbrot, 1983). The average person is familiar with Euclidian geometry that deals with lines, planes and cubes, representing three dimensions in space. In contrast to these straightforward shapes are fractal objects which have a dimension greater than a 1 dimensional line, but less than a 2 dimensional plane. As a result, the definition may be further

refined as an object whose fractal dimension is greater than its topological dimension (Cross, 1993, 1997).

Mandelbrot (1983) asserts that the defining characteristics of fractal objects are heterogeneity, self-similarity and absence of a defined scale of length. This raises an interesting question that must be asked to understand the concept of fractal. How can an object that displays self-similarity also be heterogeneous? A fractal object, when magnified at different levels will reveal different degrees of complexity which are not homogenous. However, the newly revealed small scale features resembles the large scale feature representing self-similarity. Finally, the multiple levels of self-similarity make it impossible to assign a length at any given scale. (Goldberger and West, 1987).

Nainar (1990) suggests that the self-similar nature of fractal objects provides the underlying morphogenetic principle governing the construction of highly complex, irregular structures. Since the conception and realization of the utility of fractal objects in studying complex shapes, many have applied this tool to the study of human anatomy and physiology. Cross, et al (1997) provide an example of how fractal analysis can be applied to anatomy. They wanted to know if the renal arterial tree in the kidney is fractal and if there was any correlation with sex, age, systolic and diastolic pressure. The sample consisted of 52 necropsy cases. In each case the renal tree was filled with barium

sulphate. The kidneys were then radiographed and the resulting images digitized using a video camera. The fractal dimension was then calculated by the box counting method. A control group consisting of a circle, square, and a quadric Koch island with known fractal dimensions were also analyzed to test the accuracy of the method. The renal arterial tree was determined to be fractal. No correlation between sex age, systolic and diastolic pressure was discovered. However, as multiple scaling is an essential component to fractal objects, it is possible that other levels of magnification will result in different fractal dimensions, offering correlation. Cross et al affirm that this type of methodology could be applicable to analyzing other vascular trees in the body.

Katz (1988), in an effort to quantify waveforms, provides an equation to measure their fractal dimension. The given equation is $D = \log(L) / \log(d)$. The equation was then used to measure random binary waveforms, a straight line, saw-toothed binary waveforms, random walk waveforms and a square waveform. These results were then compared to fractal analysis conducted on electrocardiograms (EKG's) and electroencephalograms (EEG's). The complex and variable wave patterns produced by EKG's and EEG's are fractal. Therefore, fractal dimensions can be used to identify different cardiac pathologies and various states of brain function.

A pioneer study by Long (1985) offers the first look at the fractal analysis of sutures. Sutures of white-tailed deer (*Odocoileus virginianus*) and fossil ammonites (*Placenticerus meeki*) were analyzed. Of

particular interest is the analysis of the complex dorsal cranial suture of the white-tailed deer. Three skulls (1 male, 2 females) comprised the sample. Comparing the sutures to coastlines and the Von Koch curve, Long utilized the yardstick method to measure for a fractal dimension. Long determined the sutures are fractal. Furthermore, Long and Long (1992) provide more evidence of the fractal nature of sutures while critiquing a fractal analysis performed on human sutures by a group of Japanese scientists. 2 human skulls were analyzed. Once again utilizing the yardstick method, the sagittal and lambdoid, and lambdoid of the respective skull were measured. In both cases the respective sutures were found to be fractal.

Goldberger and West (1987) identified other anatomical structures displaying the aforementioned fractal criteria. Structures such as the pancreatic ducts, urinary collecting system, pectinate muscle, chordae tendinae, His-purkinje system and pulmonary tree are just but a few of self-similar branching structures in humans. In addition, studies by Majumdar et al (1993) and Chung (1994) reveal the fractal structure of trabecular bone. Perhaps then, fractal objects can provide the answers to craniofacial growth and description (1990).

Purpose

Cranial sutures resemble not only the waveform of EKG's and EEG's, but coastlines as well. As discussed early, these three phenomena are fractal. Others have found fractal structures in the human body, such as the renal arterial trees of the kidney, and trabecular bone. As previously discussed, Long and Long revealed possible fractal

dimensions of cranial sutures (3 white-tailed deer and 2 humans). Further research by Japanese scientists also indicate a fractal dimension in human cranial sutures. However, the data collection and analysis in both instances were quite rudimentary. Long utilize the yardstick method of measurement, while the Japanese traced sutures by hand and relied on the box counting method. Therefore, the purpose of this study is to examine human cranial sutures (sagittal) using data collected from a digitizing pen for the existence of a fractal dimension.

Methods and Materials

107 skulls were selected from the Terry collection at the Smithsonian Institute in Washington D.C. The Terry collection contains approximately 1700 black and white skeletons, that were collected from cadavers used as teaching specimens at the Missouri Medical College in St. Louis, Missouri at the turn of the century. Donated to the Smithsonian in 1967, the skeletons are unique in that age, sex, ancestry, cause of death, and in some cases, place of birth and vocation are documented (Trotter, 1981). The 107 skulls were categorized into 30 African-American males, 30 African-American females, 26 white females and 21 white males. In order to obtain a large sample size the age range was selected for 17 to 60. However, sutures with partial fusion were eliminated. Utilizing a Polhemus 3Draw Pro model, electromagnetic three-dimensional digitizing pen, the entire sagittal suture was traced anterior to posterior at a scale of .2mm. Therefore, the pen collected a point every .2mm. The resulting data were stored in a database as x, y, and z

coordinates. For purposes of dimension the following equation was used: $D = \log(L)/\log(d)$ where L is the sum of distances between the consecutive points and d is the maximum of distances from the first point to every other point in the set. The solution was obtained utilizing "Mathematica" software.

Results

For purposes of this study, data from specimens T592, T594 and T595 were analyzed to determine whether or not a fractal dimension existed. Furthermore, in an effort to reduce the chance that differences in fractal dimension were the result of differing sex, age, or ancestry, all three specimens are of a similar biologic profile (black male, mid 20's). Specimen T592 produced a (L) of 48.7115 and a (d) of 11.2533 for a fractal dimension of 1.60531. Specimen T594 produced a (L) of 94.0077 and a (d) of 11.0481 for a fractal dimension of 1.89129. Finally, specimen T595 produced a (L) of 270.301 and a (d) of 10.7429 for a fractal dimension of 2.35845. Table 1 summarizes the results.

Discussion and Conclusions

The purpose of this study was to study the sagittal suture of modern Homo sapiens for the existence of a fractal dimension. As discussed earlier the criteria of a fractal object are heterogeneity, self-similarity and an indefinable scale of length. Illustration of these criteria is an

object of fractal dimension D, analyzing the data for a where D is $1 < D < 2$. The results, although preliminary, are very positive, strongly revealing a fractal dimension of the sagittal suture. Although the three specimens are of similar biologic profile, the results produced a widely divergent fractal dimension. Having only analyzed the three sutures it is difficult to offer an explanation. However, one possible solution can be owed simply to variation which is so prevalent in human growth. It will be necessary to analyze the remaining 104 sutures to say for certain that the sagittal suture is fractal as well as answer the question of variation. If the sutures are fractal this will provide profound evidence and insight of the genetic mechanisms governing cellular growth patterns. Having a fractal dimension might reveal that DNA codes for the process and not the individual action of each cell. Resolution of the existence of a fractal dimension of the sagittal suture paves the way for future research. At present I am interested in seeking correlation between a fractal dimension, and sex and ancestry. Identification of such correlations could serve to enhance biologic profiling within the science of Forensic Anthropology. In addition, I would like to examine the fractal dimension of the cranial structure as evolutionary markers.

Table 1. Fractal dimension of specimens

Specimen	length (L)	diameter (d)	fractal dimension
T592	48.7115	11.2533	1.60531
T594	94.0077	11.0481	1.89129
T595	270.301	10.7429	2.35845

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The Black Elite in Atlanta, Georgia: Perpetuating an Idealistic Society

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Abstract:

The study of the *Atlanta Independent*, examines a black society within a larger frame. The newspaper perpetuates the black upper elite class and endorses their values, morals, politics, and education. Although the newspaper is ideally for the entire black community, the independent seems to have a bias perception. Why does the *Atlanta Independent* choose one class over another? What is unique about the elite African-Americans in Atlanta, Georgia? How is this class able to set the standard for the race? From where did their authoritative attitude derive? Including various sources, primary and secondary, a conclusion has been made that the total context of this class originates from the peculiar institution of slavery. The *Atlanta Independent* also has a relationship with the most prominent Negro leader of the time, Booker T. Washington. Results of this study show that his philosophy was definitely a presence in the black community in Atlanta. Information collected will further refine material that already exists. In particular, the historiography of the city of Atlanta and the black community during the Progressive Era.

With any society, social structure is a central element. Whose at the bottom or at the top determines the politics, religion, economics, and language of a nation. In the United States, African-Americans have been cast as the subordinate group; therefore, they have been placed at the lowest level of the hierarchy. However, as the famous black sociologist E. Franklin Frazier states, the black community is a "nation within a nation". The black society is a complex social order that cannot be denied nor ignored; an exploration of the African-American community's stratification furthers our understanding of institutions, social behavior, and political views of the present-day. In particular, the black elite in the community has evolved over an extensive period of time. This study will reveal how the earliest multifaceted black upper class, in Atlanta, Georgia, had become an eminent presence by setting the standard in religion, education, residential area, etc. for the entire race. By looking at the *Atlanta Independent*, a black newspaper during the years of 1904-1923, one can see how this class defined themselves in every walk of life. The study will also scrutinize prominent national and local leaders who have influenced the black upper class. It is imperative to note that this well-to-do class in Atlanta, has been explored, but not at the level that gives this class justice. It is not my intent to discredit other academics, but to further refine materials that are in existence in order to understand change within

the elite, the relationship between national leaders and influence on the elite and the emerging, prominent figures that rise from this class.

Examining the earliest historiography of the Negro upper class provides a greater insight why there is a hierarchy within the African-American population. Several scholars determine that free blacks created an elite class of their own after the American Revolution. By the accumulation of wealth, through small businesses and skilled labor, many were able to enjoy the luxury of owning their own property. Like their white counterparts, some blacks also owned slaves.¹ Other researchers refer back to the peculiar institution of slavery to comprehend why classes exist in the black community. During slavery, the slave master set a division of labor, which included the few, and relatively privileged domestic/skilled workers and the far more common field laborers. Some suggest that the fair skinned blacks worked the former and therefore could draw on its status, while the blacks with a darker complexion labored in the latter. The legacy of skin color will carry over into class division after Emancipation.

For the African-Americans in Atlanta, Georgia, one can see various reasons why the upper class develops. A combination of accumulation of

¹ E. Franklin Frazier, *Black Bourgeoisie* (New York, NY: MacMillan Publishing Co. Inc., 1957), 31.

wealth and the partition of work explains the foundation of the black elite. Many blacks in Atlanta, like other newly freedmen, continued to work and live near their former slave owners. Those who had this opportunity were of mixed heritage, Negro and Anglo-Saxon, and thought of themselves in another category than Negro². Using physical appearance as a barrier between the mulattoes and the darker skinned "Negroes", most mulattos began to isolate themselves residentially from the rest of the black population. Although they segregated themselves from the Negro masses, they could not engage in the white society in which they had formed close ties. Hence, they created their own community (consisting of houses, businesses, land) with the assistance of the advantages they acquired through former slave owners.³

During the Progressive Era (1890-1920), Atlanta, Georgia was no different from the rest of the United States. There were many characteristics during this period that were universal. The growth of cities was one element of the Progressive Era. In Atlanta, the population steady increases, in particular, the rise of the black population climbs consistently through each decade of this time. With the expansion of both races in Atlanta, race and class became a relevant issue. This is also a characteristic of the

² David Lewis and August Meier, "History of Negro Upper Class in Atlanta, Georgia, 1890-1958," *Journal of Negro Education* (1959): 130.

³ E. Franklin Frazier, *Black Bourgeoisie* (New York, NY: MacMillan Publishing Co. Inc., 1957), 120-125.

time. Race relations in the country were deteriorating; thus, discrimination against the black population increased. One form of segregation occurred with a Supreme Court ruling. *Plessy vs. Ferguson, 1896*, declared that blacks and whites were equal, but any institution in America could have separate accommodations. The phrase was coined, "Separate but equal". The decision encouraged many southern states to pass an incentive for many of the Jim Crow laws (discrimination de jure laws) that were in place.

In the twentieth-century, these discriminatory laws will become known as the American Dilemma or the "Negro" problem. What exactly was the "Negro" problem? The African-American dilemma was co-existing with their white counterpart, while receiving the same rights under the Constitution. In particular, the turn of the century black upper class in Atlanta believed that the two races could live in harmony. The emergence of the black bourgeoisie reflected another element of the Progressive Era, the rise of the middle class. This new black elite thought that they were the "better class" of the race and therefore could be the shining examples for the race to be included within the larger frame of society. Many blacks of this flourishing class, made individual strides to reveal that their class was the best.

A product of this prosperous community was Benjamin Davis Sr., the editor of the *Atlanta Independent*. Davis was a devout Republican and endorsed the participation of other blacks in this party, especially at the state level on the various committees. A colleague of Davis, John Calhoun, stated, "Davis was a fearless man. He would attack anything that looked

like discrimination or segregation. He was a fearless man, I never will forget."⁴ However, for the race, engaging in politics was a goal to obtain, but there were many objectives to reach this level of civil rights.

In an emancipation oration in Rochelle, Georgia, in 1905, Benjamin Davis focused fearlessly on the "race problem from an economic and industrial standpoint". The black community was in the midst of the 42nd freedom anniversary. Although many gave reverence to the 'Great Emancipator', Abraham Lincoln, Davis encouraged the audience to take advantage of their freedom by being responsible for their individual actions; this was the greatest honor the race could bestow to their hero. Davis further explained that being a responsible Negro led to civilization; and the basis of civilization was economics, industry, and agriculture. Other contributing factors were character, intelligence, respectability, and wealth. Acquiring these characteristics would ultimately lead to equal rights and participation in the government. Elements of Benjamin Davis's speech would be a common theme throughout the *Atlanta Independent* and guiding principles for his fellow elite cohorts.⁵

⁴ Clifford M. Kuhn, Harlon E. Joye, and E. Bernard West, *Living Atlanta: An Oral History of the City, 1914-1948* (Atlanta, Georgia: The University of Georgia Press), 331.

⁵ *Atlanta Independent* (Atlanta, Georgia), 14 January 1905.

Benjamin Davis' *Independent*, did follow traditional newspaper patterns, published local and nation events and advertisements, but it also had a frequently, self-conscious published mission statement. The *Atlanta Independent's* mission declared that the greatest feat of the newspaper was to immerse itself in aiding in the development "of all people" for the better good of the entire country.⁶ The newspaper went on to state that their main interest was "principles not men". At the forefront of its' journey would be the struggle for "manhood and equal political and civil rights of the race". Ideally, this weekly paper would have a profound connection with the entire race regardless of economic and/or political standing. However, the newspaper reiterated the social stratification of the black community.

The thinly veiled editorial biasness of the *Atlanta Independent* perpetuates the ideals of respectability and morality held so dear by Atlanta's turn-of-century elite blacks. So what is respectability? For the black bourgeoisie of Atlanta, before one could earn the honor of respectability, one had to show it with a great deal of wealth: associations with various organizations, churches, political party; and intelligence. Respectability was a perception of others, mainly the upper class at least in their minds. The upper class prided themselves because they had valuable service skills that were useful to the city of Atlanta. Whether it was being a barber, draymen, or small entrepreneur, their clientele was primarily white.

Although during this period, economic opportunities were limited, wealth was a factor,

⁶ Ibid, 30 January 1904.

but more importantly, hard work, religion, cleanliness, and respect for the dominant society's mannerisms and morals were at the center of attention.⁷ The elite attended the best churches, First Congregational, Friendship Baptist, and Wheat Street Baptist. One editorial read, "Religion reform is an imperative demand among the coloured people".⁸ Many of the upper class believed that the "coloured people's" church was too emotional and that it demonstrated a lack of self-discipline. The black upper class congregation had a passive and "moderate" service.⁹ This suggests that other places of worship that the elite class did not attend needed to be restructured. For they were the "better class" and alterations in their institutions were not needed.

Looking at the *Independent*, a plethora of distinguished males, was present. These men, leaders in their respective fields (ministers, entrepreneurs, physicians, lawyers, and educators) were the

⁷ Evelyn Higgobotham, *Righteous Discontent: The Women's Movement in the Black Baptist Church, 1880-1920* (Cambridge, Massachusetts: Harvard University Press, 1993) 205.

⁸ *Atlanta Independent* (Atlanta, Georgia), 30 January 1904.

⁹ Georgina Hickey, "From Auburn Avenue to Buttermilk Bottom: Class and Community Dynamics Among Atlanta's Blacks," *African-Americans in the Industrial City: Historical Roots of the Contemporary Urban Crisis, 1900-1950* (August 2000), 5.

epitome of what "the best" Negro should be. The black elite male participated in Masonic organizations (Odd Fellows) and social organizations (Boule of the Sigma Pi Phi and Twenty-Seven Club).¹⁰ These leaders of the race were men of noble character. These exclusive clubs indicated the maturity of the class, but also revealed the division within the class. For instance, if a family had been around since the 1880s and 1890s, they might not have the same wealth as the turn of the century elite. Therefore, because of their family name, socially they were still in the elite class, economically they were at the fringes of the upper class.

They were often mentioned as men who came from a good family background and a person who had many friends. Mingling was an essential activity. The black, male bourgeoisie adamantly believed "that what was good for the middle class was good for all".¹¹ The attitudes of these men were an imitation of what they saw in white society. The man was the sole breadwinner for the family; leaving the woman to her 'cult of domesticity' (a sign of

¹⁰ David Lewis and August Meier, "History of Negro Upper Class in Atlanta, Georgia, 1890-1958," *Journal of Negro Education* (1959): 132-133.

¹¹ Georgina Hickey, "From Auburn Avenue to Buttermilk Bottom: Class and Community Dynamics Among Atlanta's Blacks," *African-Americans in the Industrial City: Historical Roots of the Contemporary Urban Crisis, 1900-1950* (August 2000), 2.

wealth and prosperity). Such ideologies of the dominant, black, elite male, often maligned the working class and women of black society.¹²

The elite woman was to stay home and take care of the children and she also had to look the part. However, she did have other obligations such as church events and social clubs and gatherings. The Twelve, a social club, and the Chautauqua Circle, a literary society, were the most prominent organizations.¹³ The *Independent* regularly published social events that different elite organizations had. The editorials encouraged women to participate in balls.¹⁴ Women were also expected to participate in the social arena, like having parties. This was important because she was the director of the social events. She was to display the culture and taste of her elite class. This performance by the bourgeoisie class was to show the white society and the "Negro masses" of the class' refinement. To this end, the *Independent* printed every event, even to the minute detail of the celebration such as the menu and/or decorations.¹⁵

The standard of respectability and high morals set by the black bourgeoisie had nothing to do with making the "Negro masses" better

¹² Ibid, 4.

¹³ David Lewis and August Meier, "History of Negro Upper Class in Atlanta, Georgia, 1890-1958," *Journal of Negro Education* (1959): 132-133.

¹⁴ *Atlanta Independent* (Atlanta, Georgia) 21 May 1904.

¹⁵ Ibid. 23 January 1904.

individuals; rather, the characteristics of civility had everything to do with being accepted into the white society. Another editorial read, "Moral courage is a fundamental necessity of our citizenship."¹⁶ Of course, the black elite was the epitome of an outstanding citizen; while his poor working class brother, could use a few lessons in what it takes to become a cultured individual. Another editorial reads, "If the Negro paid as much attention to building up character and respectability as he does grumbling about privileges denied him, he would obtain many rights denied him."¹⁷ At the turn of the century, southern whites had made it crystal clear that all African-Americans were the same, uncivilized, and they used Jim Crow laws to make their opinion more profound. Acquiring social acceptance from the white counter parts often meant an alteration in speech patterns, mannerisms, and morals.¹⁸ The elite youth were taught to speak grammatically, not use dialect of the Negro masses and to always speak courteously.¹⁹ During this era, Booker T. Washington was the dominant Negro leader or as

¹⁶ Ibid. 6 February 1904.

¹⁷ Ibid. 20 August 1904.

¹⁸ Evelyn Higginbotham, *Righteous Discontent: The Women's Movement in the Black Baptist Church, 1880-1920* (Cambridge, Massachusetts: Harvard University Press, 1993) 210.

¹⁹E. Franklin Frazier, *Black Bourgeoisie* (New York, NY: MacMillian Publishing Co. Inc., 1957), 70.

the *Independent* stated, "Our Natural Leader".

In Washington's famous 1895 Atlanta cotton Exposition speech, he referred to African-Americans as Negro. This became a politically correct and respectable term to use for blacks. For other blacks that wanted to be recognized as Afro-Americans or African-Americans, this became unacceptable.

The growing prominence of Booker T. Washington's philosophy of uplift encouraged a focus of morality of Atlanta's elite. Although morality is deeply rooted in respectability, cleanliness had close ties to morality. The upper class viewed the morality/cleanliness of a person by their residential area. Living in area such as Buttermilk Bottom, Beaver Slide, and Darktown, was not acceptable. These areas lacked every conventional elements that today we take for granted. Paved roads, electricity, and private toilets were denied in these areas. Regardless of race, these areas were considered "of a lower income or lower standard of moral behavior or patterns of life."²⁰ Dissipated acts such as prostitution, bootlegging, and crime were associated with these areas of the working class²¹. An¹

²⁰ Georgina Hickey, "From Auburn Avenue to Buttermilk Bottom: Class and Community Dynamics Among Atlanta's Blacks," *African-Americans in the Industrial City: Historical Roots of the Contemporary Urban Crisis, 1900-1950* (August 2000),

²¹ Tera Hunter, *To 'Joy My Freedom: Southern Black Women's Lives and Labors After the Civil War*

editorial stated that “ The only Negro cure for crime and immorality is employment”.²² Although the working class was making the best money they could, they were encouraged to work harder to reach the level of respectability. Unlike this immoral class, the black elite lived in stylish Auburn Avenue or the Westside closer to Atlanta University. Auburn Avenue became the place for many commercial businesses, especially after the Race Riot of 1906. Auburn Avenue or Sweet Auburn was seen as the place to be. “Sweet Auburn” had a national and local reputation of black economic success.

In further research, I would like to explore the transition of the elites from skilled labors to educators and entrepreneurs or the transition of Booker T. Washington school of thought, industrial to John Hope of Atlanta and W.E. B. DuBois school of thought, higher education. I want to understand other shifts within the community, particularly the rise of the westside as an elite enclave to rival that of Auburn Avenue. Finally, I would also like to look at the next generations of black elites, that followed the path laid by Atlanta’s turn of the century black elite, The Dobbs and King Family to examine where the city’s first black mayor, Maynard Jackson and the national figure, Martin Luther King, Jr. originated.

(Cambridge, Massachusetts: Harvard University Press, 1997), 101.

²² *Atlanta Independent* (Atlanta, Georgia) 16 July 1910.

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The Quarterman Incident: The Albany Movement Pushed Back to Strength

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Abstract:

This research project sought to examine the struggle for civil rights in one small, rural town in southwest Georgia. Albany, Georgia was one of many locations in which the battle for civil rights was fought. The local African American population gathered along with college students from the area to protest the segregation laws that dictated their lives. Dr. Martin Luther King, Jr. traveled to the small town to assist in the struggle. His name brought national attention to the area, but his involvement did not bear any fruit. Ola Mae Quarterman, a freshman at Albany State College in 1962, also played an important role in the struggle towards racial equality in Albany. Her refusal to give up her bus seat landed her thirty days in jail. Ola Mae's story is similar to that of Rosa Parks, yet she did not receive the national publicity that Parks has earned. Her refusal prompted the Albany Movement to continue their protests after King had left town in defeat. This study analyses the Quarterman incident and attempts to determine the direct effect that her actions had on the Albany Movement. This study is also concerned with the question of why such as heroine has gone

practically unknown for the past thirty-eight years. The Quarterman incident provoked one of the largest Black protests in Albany during the Civil Rights Era. Information contained in this research will give local Albany citizens and Quarterman the recognition that they deserved for their contributions to the Civil Rights Movement.

Many historians have approached the civil rights demonstrations in Albany, Georgia with the idea that nothing significant occurred, that is, if Albany is even mentioned at all in their research. Adam Fairclough's Martin Luther King, Jr. depicts the movement there as a bitter defeat. He refers to the situation as "a minor local difficulty that could safely be ignored." Those who were present and took active participation in the numerous marches and demonstrations tend to have a very different opinion. Charles Sherrod, leader of the SNCC (Student Non-violent Coordinating Committee) organizations in Albany, declares that "writers have taken the 'sexy' parts of the movement and headlined them." It would be more meaningful to say nothing *sensational* occurred in Albany according to Sherrod, who later explained in our conversation that "No buses were burned, no people were killed in Albany, so of course no one will remember."

Albany, Georgia is a small, quite town in Southwest

Georgia. Having lived in the "Good Life City" for several years, I was aware that there had been a movement of sorts and that Dr. King had graced the city with his presence. That is were the story ends for many of the local residence, including myself until recently. Through the agent of research and motivated by mere curiosity, a new version of the story has emerged. Albany was taken by storm by it's African American community in 1961. Many were actively involved in the efforts against segregation, but there is one individual who is often over looked in the history books. She alone helped to carry the movement along when the people were both emotionally and physically drained. This is the story of Ms. Ola Mae Quarterman. Though her actions with the Albany Movement proved to be most beneficial, her story is not acknowledged even by local residence. She carried the movement on her back, but has received very little recognition. Through my research I hope to rectify this neglect and bring to light one of many "unsung" heroes of the Civil Rights Movement.

To understand the role that Quarterman played in the movement, one must have sufficient background of events that led to the incident in order to create a context in which to evaluate the matter. The Albany movement was initiated due to several other circumstances. Those who were key in its formation initially had other plans for the city, but realized that there were more serious issues to be dealt with. It was August of 1961

and SCNN had decided to focus its efforts toward voter registration in Albany along with other surrounding counties. They sent two field secretaries, Charles Sherrod and Cordell Reagon to organize and recruit supporters for the program. The two college aged men were not received very well. The local sentiment was mixed. Many of the citizens were very reluctant to work with them. Many believed that these men should move along and leave Albany to handle its own problems. Others, mostly students from local high schools and historically Black Albany State College, were very interested in finding a new agent for social change. After months of recruiting and active voter registration drives, the SNCC representatives found the area to be much more hostile than expected. The surrounding counties, Terrell, Mitchell, and Sumter were much more resistant to their efforts. Sherrod and fellow SNCC members decided to change the focus of their involvement in the area toward desegregation of the bus terminals with the primary target being Albany since it was the largest city in the area. It was November 1, 1961 when students gathered and decided to test the compliance of the Cities Transit, Inc. bus station with the 1955 Interstate Commerce Commission's (ICC) ban on the segregation of trains and buses across state lines. The ruling was to go in effect that day. The students were lead by Sherrod and Reagon. This demonstration at the "white only" waiting room resulted in the first Albany sit-in.

As more local civic groups became involved in the protests, the organizational aspects were slowly being buried under the different purposes and values of the groups. Almost

three weeks after the first demonstration, the organizations collectively decided to assemble under one "umbrella organization" in which their plans to desegregate Albany could be facilitated. The Albany Movement, a local African American coalition group, was formed. The organization was made up of such social groups as the Negro Voters League, NAACP, the Criterion Club (a group of Black Professionals) and The Women's Clubs. Under the Albany Movement more demonstrations were organized and soon the members were being arrested for ludicrous charges of trespassing and disturbing the peace. After the arrest of five students, the first mass march was held. Over four hundred people marched in protest and petitioned the expulsion of the students by Albany State College President, Dr. William Dennis. On December 10, eleven Freedom Riders arrived in Albany and were taken in custody upon trying to exit the station. The integrated group was also testing the stations compliance with the ICC ruling, so as they unloaded off the bus, the White riders used the 'colored' waiting room and the Black riders used the 'white' exit. They were arrested immediately.

The Movement had no real experience with protest and certainly none with mass arrests. The ball was still in their court, but no one knew how to call the next play. At the next mass meeting held at Mt. Zion Baptist Church, the leaders who had not been jailed made the decision to ask Dr. Martin Luther King to join them in their struggle. The decision was a split one. Many thought that Albany did not need the national attention that King would surely bring with him. Others believed it was just what the city needed. There was much

discussion about the invitation, however, no one could think of a better way to address the situation. On December 15, 1961 Dr. William Anderson, the President of the Albany Movement made a personal phone call to Dr. King inviting him to make a speech for the members. As King traveled the miles to Albany, more protests occurred and whispers of negotiations were in the air. The Movement wanted a biracial committee in which would oversee the negotiations. This was granted and soon the demands were placed on the table. The City wanted the immediate halt of all demonstrations. The city was ready to promise the desegregation of the bus and train stations within thirty days, given the protesting would stop. In return, the Movement demanded that further negotiations be held with the formation of a formal biracial committee and that the demonstrators be released from jail with a dismissal of all charges. This is where the discrepancy came into play. The city would not make any such concessions.

Dr. King arrived in time to hear the latest on the failed negotiations. He addressed the members of the Movement and found himself more involved than originally planned. The next day he and Ralph Abernathy led a mass march to city hall to protest and over 400 people were arrested, King included. The jails were quickly being filled. Laurie Prichett, the police chief, was sending the demonstrators to jails in neighboring countries as a counter attack against the Movement. He refused to succumb to the demands of the demonstrators and used his political position to secure victory. He made phone calls and

preserved the authority to fill as many jail cells within a fifty mile radius. King vowed not to accept bail. Prichett, who had been warned about King's arrival, knew that this could mean trouble for his city. In preparation of King's visit, the police chief vigorously read the teachings and philosophy of non-violence that King was noted for practicing. He decided that the best way to stop King was to kill him with kindness. He trained his men to be 'non-violent' in the way they handled the African American citizens. He would not allow the national media to bash the public opinion of Albany by sending dogs and water hoses to suppress the protestors. As a result, no one was the victim of police brutality or violence. This prevented the Federal government from becoming involved. Prichett had stopped the effectiveness of King's strategies by using them against him.

While more arrests had been made, the negotiations continued. After much deliberation, the city offered the Black community a deal. The bus and train stations would be desegregated at the end of thirty days if all demonstrations ceased. Secondly, the city would release all those who were jailed without receiving payment of any cash bond. The formation of the biracial committee would be considered after the thirty days, but before sixty days passed. The main concern for the organization was to get the members out of jail. The deal was not satisfactory by any means, however, there seemed not to be much choice. The Movement agreed to the deal. Days later, because the deal was not documented in writing, the city released the protestors, but denied any knowledge of this 'deal' to make concessions to its

Black citizens. King's fines were mysteriously paid off at the order of some city official and upon his release, he left town quickly and quietly.

The Movement seemed to have lost the game. King had left town and the 'deal' that had been agreed to was suddenly non-existent. Prichett and his non-violent retaliation against the organization appeared to be effective. The national attention that Albany had attracted slowly withered away. The President's office and other political offices were calling to congratulate Mayor Asa Kelly on a job well done. He, along with the other political sharks of Albany, had kept the need for federal intervention at a minimum. Though King had contact with President Kennedy several times, the presence of the national guard was not a necessity in the small rural town. As a result of the situation, the anguish of the movement members was evident. Sherrod recalls, "We were drained emotionally". The black community would be correct in taking the devastating blow to heart. King, who was revered as the fearless leader, had left town, just as Prichett probably desired. The media was unsympathetic in the way that the situation was depicted. The 'double cross' deal was spread over every major newspaper and the next question asked was what was the purpose of King traveling to Albany? It is logical to assume that this was the root of further negative publicity that Albany was to receive. Historians and critics alike seize this moment to exploit the story. It wasn't long before the situation rectified itself.

The energy that once flowed through the veins of the activists now only gave a faint pulse. The holiday season was

upon them and many found their support groups and most active members going home to their families, as many of them were college students. This left somewhat of a void. Hope was not lost, but definitely something that was scarred. The next move for the demonstrators was uncertain, but soon they received more motivation than perhaps King could have ever provided them. Her name was Ola Mae Quarterman.

Ola Mae was just an eighteen year old freshman in the winter of 1962. She had picked cotton as a means to finance her college career. She had plans of being a social worker after graduating from Albany State College, however, the events that followed would have a disastrous effect on her life. It was January 12, 1962 and Ola Mae caught the bus into town as she did everyday. She paid her fare and searched the bus to find a seat. The bus driver, a white male, was busy conversing with another passenger and paid little attention to Ms. Quarterman. Seeing that both Black and White passengers were scattered throughout the bus and not in any particular seating arrangement, Ola Mae found comfort in the second seat from the front of the bus. Ola Mae picked this seat because the view of the winter country side was incredible. She recalls fondly looking at the trees with their bare branches. She was mesmerized by the scene and remained in her daze throughout the remainder of the ride. It wasn't until the bus entered the city limit that the bus driver pulled over and demanded that Quarterman give up her seat. When she refused, audaciously proclaiming "I paid my damn ten cents, I'll sit where I please", the enraged driver forcefully grabbed Quarterman and threw her on the

floor. An officer was called to the bus and Quarterman was arrested immediately.

After being sentenced to thirty days in jail and fined one hundred dollars, Quarterman had unknowingly rekindled the flame within the ranks of the Movement. Shortly thereafter, protests were being organized. The Movement used a different approach to provoke the attention of the city. The bus station, which was supported by the black community, would be the target of a city-wide boycott. The black community provided between seventy-five and eighty-percent of the total patronage of the city bus system. The loss of this revenue would prove to be detrimental. Car pools were organized and not even a full month had passed before the station felt the wrath of the activists.

Ola Mae admits, "I never knew I had so many friends". The support she received was heartwarming. She had been a quit activist in the movement, but soon everyone was familiar with the name Quarterman. Upon questioning Sherrod about the correlation between Quarterman's rebellion and the progress of the Movement, he commented, "It came at a good time, the emotional energy had left us and she reinvigorated everyone to get involved." Quarterman's story probably sounds familiar in a sense. It closely resembles that of Rosa Parks, a nationally recognized participant in the Civil Rights Movement. So, why is it so hard to find a sentence, much less a paragraph, covering the role that she played in Albany? Perhaps the media had had enough of black women refusing to give up their bus seats. It had occurred once before Quarterman's defiance and

probably would happen again. The life that Ola Mae was to lead after her arrest may also be a determining factor.

The Albany Movement was very productive in its new strategy for protest. By February, Cities Transit, Inc. found itself shutting down its services due to lack of revenue. The company was ready to comply with any demand that the Movement placed on them, including desegregation, but the city was not. The City Commission refused to pledge a non-interference stand on the issue, so the negotiations between the two groups were null and void. This went on for the next month. The City Commission was adamant about not giving in to the demands of the Albany Movement. By early March the bus company was moving equipment to its headquarters in Tallahassee. The Albany movement succeeded in shutting down the station and was ready to continue their efforts. The movement continued. The next boycott was on the merchants downtown who refused to employ or accept the applications from African Americans. The downtown area became a place that was not 'safe' for the white community due to the mass demonstrations and violence that may have occurred as a result. The Mayor grew tired of his town falling to shambles at the hands of these "uppity Negroes". He tried to contest the decision of the city commission, but was claimed to have been threaten by the other members. Sources indicate that he would have suffered public disgrace if he continued to go against the majority. The internal conflicts of the Albany political sphere soon became public knowledge. What is important to understand here is the process in which this internal conflict came

into existence. By one young woman raising her voice on a public transit system, the whole history of Albany was altered. The members of the Movement were in search of new motivation after King's departure. Ola Mae provided the motivation they needed. It can be assumed that perhaps if Quarterman had not reacted the way that she did, there would not have been any Albany bus boycott. Had their not been a boycott, the station would have remained in business and the Albany Movement would not have held the economic status of the city in their hands. The cause and effect relationship that the Quarterman incident had with the late progress of the Albany Civil Rights Movement is obvious. The records indicate the relationship is mediocre at best, however, the degree to which Quarterman suffered speaks to a deeper, more concrete connection. She sacrificed a great deal of herself being the Movements much needed catalyst.

It was about three years after the run-in with the city bus driver that Ola Mae suffered from what has been noted as a nervous breakdown. Her education came to an halt. Ola Mae was expelled from Albany State College. Other students received scholarships to attend other institutions and were able to proceed with their education, but Quarterman's economic status would not allow for her to transfer to another institution. Though she recalls the community not totally ostracizing her for the incident, life was more than likely still a struggle for her. Given the time period and the culture of the generation, it is probable that the elders of the community looked down on Quarterman for her use of profanity. Her mother often

suffered more hardships on her job for her daughter's uprising. Further more, after a difficult labor, Quarterman gave birth to a son which was another set back on her health and finances. After this mysterious "breakdown" Quarterman was shipped to Central State Hospital in Milledgeville, Georgia. She spent thirty three years being institutionalized under extreme conditions. The hospital was notorious for its cruel treatment.

Recently, Ola Mae returned to her home and was welcomed with open arms by the few who recognized her story. The city held a reception for her and she was praised for her role in assisting Albany with its battle for civil rights. Quarterman, who was very surprised at the mention of anyone doing research on her, was more than happy to tell the story that had turned her life upside down. On reflecting on the long term effects, Quarterman's smile and enthusiasm was hidden behind eyes of sorrow: "I missed out on life . . . my education, my family ... I came back and all my friends were retired from teaching and had families". Ola Mae had to sacrifice a major portion of her life as a result of her actions on that bus in 1962. She does acknowledge the fact that if she would have had the support of the white community as well as the Black, she would do all over again.

Many details are yet to be discovered about how this heroine survived through the struggles she was faced with. There are many questions that may or may not have the answers that society wants to hear. The fact remains that Ms. Quarterman gave up a very significant part of her life which will never be recovered. The Albany Movement found strength in Ola

Mae. Ola Mae found strength from them, also, but only for a while. The civil rights era probably produced more heroes and heroines than any other part of American history. Unfortunately, many of them, like Quarterman, have gone unnoticed for the last thirty to forty years. Her part in the movement may appear to most as insignificant, but for her, that one incident determined the rest of her life. Quarterman is living well in Albany and has been reunited with the life she left behind thirty-three years ago. Ola Mae also adds that she since returning to Albany, she still rides the bus . . . everyday.

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The Effects of Various Materials for the Purpose of Sound Reduction

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Abstract:

This study examines the effectiveness of pre-selected materials for the purpose of sound insulation and sound absorption. Sound is an organized movement of molecules caused by a vibrating body in some medium of water, air, etc. physically, sound is a longitudinal wave where the motion is in the direction of the energy movement. Sound can be measured in terms of hertz. However, most people commonly understand sound measurements in terms of decibels. Sound reduction occurs through a combination of sound insulation and sound absorption. Sound insulation occurs when sound is prevented from traveling from one place to another or by reducing external noise. Sound absorption occurs when sound is converted into heat. For the purpose of conducting this research, a model impedance tube was created. Thirteen test cells were created. The cell was fastened on one end of the tube and was then subjected to sound coming from the other end. A sound level meter was used to measure how much sound was allowed to pass through the cell. By conducting the experiment in this manner, the amount of sound reduction in the given test cells was able to be found. Due to the advances in material science, this

experiment is just the beginning of an effort to control sound.

INTRODUCTION

The physical phenomenon known as sound has been a mainstay of the world since its inception. However, only over the last century have physicists or engineers considered seeking to control the heard, but unseen wonder. People now have a genuine concern for controlling the sound that is around them. Some would like to enhance the sound quality of their audio production systems. While others would prefer to keep unwanted sounds out of their homes, office buildings, and churches. For those reasons and others, sound reduction is a very important facet of the physicists and acoustical engineers work. Therefore, the purpose of this study is to gain a knowledge for and add to the advances of sound reduction.

HISTORY OF SOUND

The science of sound is on record for being studied for at least four centuries. Until 1600 AD little was known about the subject aside from idle guesses from the philosophers of the time. The ancient Greeks were the first to take an interest in sound. However, they were not interested in sound itself. Rather, they were more concerned for the musical notes that sound produced. The Greeks considered musical notes to symbolize "applied numbers." The Greek philosopher and mathematician Pythagoras, discovered that an octave represents a two-to-one frequency ratio and formulated a law connecting harmony with

numerical ratios. Other famous philosophers and mathematicians have also studied the field of sound. Aristotle made brief strides in the field of sound study. Galileo derived a relationship between frequency and pitch. He also aided to the laws of musical harmony and dissonance (clashes in chords).

Between the 16th and 18th centuries, advances were made in the study of sound by well-known mathematicians. The French mathematician Marin Mersenne measured the time of the return of an echo. He also derived the crude determination of the actual frequency of a note of a given pitch. In 1687 Sir Issac Newton determined the propagation of sound through fluids was dependent on measurable properties of the fluid such as, density and elasticity. During the 18th century the knowledge of pitch and frequency were contributed to by the Dutch mathematician Johann Bernoulli, and the Swiss mathematician Leonhard Euler.

THEORY

To understand the difficulties of sound reduction one must first understand sound itself. Sound is an organized movement of molecules caused by a vibrating body in a medium of water, air, etc. It is often represented graphically as a sine wave. Physically, sound transmitted through air is a longitudinal wave in the direction of the movement of energy. As a comparison, sound acts in the same manner as the waves that are created when a person throws a rock into a still lake. The ripples that are created will continue to travel until some

force stops it. This fact holds true due to Newton's first law of motion, which states that an object will remain in motion until another force acts upon it. People, trees, furniture, other sound waves, etc. will stop a sound waves motion. There are three characteristics that all sound waves possess, they are frequency, amplitude, and intensity.

Frequency is the number of sound waves created per second. Reverting back to the rock and lake example, frequency would be the number of waves coming from the initial point of the rock upon entering the water per second. This scenario would be very easy to calculate because these waves can be seen and counted. However, for sound this is not very easy to do. Sound frequency is measured in terms of hertz. Frequencies ranging from 15 to 20,000 hertz can be heard by the human ear. In terms of loudness the human ear is more

sensitive to some frequencies than others. For example, the ear hears a tone of 1000 hertz louder than a tone of 200 hertz or 4000 hertz.

Amplitude is the degree of motion of air molecules within a sound wave. This corresponds to the extent of compression that accompanies a sound wave. In terms of loudness, the greater the amplitude of the wave, the louder the sound. This occurs because the molecules of the sound wave hit the eardrum harder and thus it is perceived to be a louder tone. Amplitude of a sound wave can be expressed in terms of absolute units in various ways, one is to simply measure the amount of energy involved. For example, ordinary speech produces sound energy at a rate of about one hundred-thousandth of a watt. To measure amplitude is a very difficult task. However, the intensity of sound is generally expressed by comparing the individual sound to a standard

sound. This measurement is made in decibels.

The intensity of a sound wave is the average rate of flow of energy per unit area, perpendicular to the to the direction of propagation. In simple terms intensity is how loud sound can be heard at a given distance. For example, if a person stands directly in front of a concert speaker they are more likely to hear sounds louder than a person that is standing in the back of the hall. As mentioned earlier, sound is measured in terms of decibels. The range of sound is between 0 and 150 decibels. 10 decibels is the threshold of good hearing. While 110 decibels would equal the sound of a rock band. Most conversational speech occurs between 60 and 70 decibels. The following table will aid in the relation of decibel levels and common sound sources. Now that

Table 1. Sensory response based upon increasing decibel level

Source	dB level	Sensory Response
Threshold of good hearing	10	Very faint
Whispered conversation	30	Faint
Conversational speech	60	Moderate
Computer printout room	80	Loud
Loud rock band	110	Threshold of discomfort
Passenger ramp at jet liner	120	Threshold of pain
Military jet takeoff at 100 ft	140	Extreme danger

the background of sound has been explained a brief description of sound reducing methods should be described.

One method of sound reduction is sound insulation. Sound insulation is the method of preventing sound from traveling from one place to another. This can be achieved by using a double leaf partition (2 separated independent walls) or by doubling the mass per unit area of a wall. Sound absorption is the method of transferring sound into heat or to allow sound to enter a material but not leave it. Soft materials such as cork and felt

absorb sound. However, these materials may reflect some of the low frequency sounds. Materials that are ideal for sound absorption are generally poor sound insulators. Acoustical engineers can also employ materials that reflect sound. Materials that are hard in nature tend to reflect sound. Metals and stones generally have a reflective effect on sound. For the purpose of this study materials that act as sound absorbers and sound insulators were used, with the exception of sheet metal, a sound reflector.

IMPEDANCE TUBE AND TEST CELLS

The basic idea of the impedance tube is to utilize a rigid walled tube, of constant cross sectional area. On one end of this tube is a speaker for sound generation, on the other end is a sample whose sound reducing qualities are to be measured. Once the sound generator is turned on a wave of pre-selected frequency is transmitted through the tube. A sound level meter will measure the decibel level that is produced.

Table 2: Test cell description including weight and thickness

Test cell	Weight (oz.)	Thickness (inches)
Ceiling Tile	2.7	.50
Pine Shelving (wood)	6.3	.75
Styrofoam	.20	.625
Commercial Carpet	1.1	.125
Sheet Metal	2.8	.0025
Wood/Carpet	7.5	.875
Carpet/Sheet Metal/Wood	10	.875
Styrofoam/Wood	7.8	1.375
Styrofoam/Sheet Metal	3	.70
Styrofoam/Carpet	1.4	.889
Sheet Metal/Styrofoam/Wood	9.1	1.5
Styrofoam/Ceiling Tile/Wood	9.8	2
Styrofoam/Sheet Metal/Ceiling Tile	6.5	1.25

QUESTIONS TO BE ADDRESSED

- What materials give the greatest acoustical dampening effect?
- Are there combinations of materials that improve dampening effect?
- Is there a dampening range of the various materials i.e. (Best-Worst)
- Does weight have an influence on sound reduction?

The impedance tube used for this particular research consisted of a 22 inch PVC pipe of 4 inch diameter. The pipe was connected on both ends by couplers, which allow for the connection of the other pieces without changing the internal diameter of the pipe. On one end of this tube is a 6 inch speaker enclosed by a 5 X 9.25 X 9.25 inch box made of 3/4 inch pine shelving, filled with Styrofoam padding to ensure that all of the sound is traveling in the direction of the test cell sample. On the opposite end of the tube is a 9.25 with a four-inch hole in its center. It is connected to another square piece of 3/4 inch pine shelving by four carriage bolts and wing nuts. This particular piece of wood has a small hole cut into it to allow for the sound level meter to be placed.

The sound level meter reads levels of sound from 50 to 126 decibels. It has an accuracy of plus or minus 2 decibels. This meter reads sound weights of A and C class. The sound generator that was used can produce 3 different types of sound waves, including a sine wave, which is very important for this experiment. This sound generation device produces frequencies ranging from .002 to 2 million hertz.

The test cells used for this experiment were chosen for their various sound insulation and sound absorption qualities. These materials were tested individually for their sound reduction capabilities. Combinations of these materials were also tested for their sound reduction capabilities. A list of these materials with their weights and thicknesses are listed on this page and the next.

METHOD OF RESEARCH

The experimental analysis of this research project was quantitative in nature. Before conducting studies on each of the individual test cells, there was a preliminary reading of the decibel level per frequency. At a frequency of 500 hertz a tone of 119 decibels was produced. At levels of 1000 and 1500 hertz levels of sound were read as 101 and 100 decibels respectively. Upon recording these preparatory readings, each cell was placed and secured between the two boards. The sound generator was set to a particular frequency and then turned on. The tone then traveled through the tube where the particular cell was placed. A sound level meter attached to the outside end of where the cell was secured reads off a decibel level. This sound level is amount of sound that was allowed to pass through the test cell. Each time a new frequency was subjected to a test cell, the sound level meter was reset to assure for an accurate reading. After testing each of the cells at the three frequency levels the results were recorded and analyzed to possibly answer the questions of research.

RESULTS

Upon completing the experiment, results were recorded for data analysis. At a frequency level of 500 hertz, which is equal to 119 decibels, test cell 13 reduced sound the best. This particular cell, made of Styrofoam, ceiling tile, and wood gave a 27 percent decrease in sound. This cell reduced sound from 119 decibels to 87 decibels. The most inefficient material at this frequency was commercial carpet. Commercial carpet had no sound reducing capabilities at the frequency of 500 hertz. Upon

increasing the frequency to 1000 hertz, there were two cells, which reduced sound the best. These were cells 3 and 10. Both of these cells caused a 14 percent decrease in sound. They allowed the level of sound to be reduced from 101 decibels to 87 decibels. Considering that one of these cells included commercial carpet, I suspect that the Styrofoam was the major influential factor at reducing sound at this level. Test cell 11, a combination of Styrofoam, sheet metal and wood gave no significant sound reducing capabilities. At present a determination can not be made as to why this occurred. Upon increasing the frequency level to 1500 hertz, there was one cell that stood out in deadening sound. Cell 8 allowed for the best sound reduction. It gave a 26 percent decrease, reducing the level of sound from 100 decibels to 74 decibels. The most inefficient cell was made of commercial carpet. This cell allowed for only a 6 percent decrease in sound. There are definitely certain cells that allow for significant sound reduction at each level. Upon analysis of data, if one would like to reduce sound they may want to choose a combination of carpet, sheet metal, and wood or Styrofoam, ceiling tile and wood. Also it seems from this particular study that the weight and thickness of the test cell did have an influence in its particular sound reducing capabilities.

ERROR ANALYSIS AND FURTHER RESEARCH

There were a few places for error within this particular research project. The first being set up of the impedance tube. It was created from commercial materials, which could lead to problems in the experiment. For

example, the wood used in this tube was of medium quality, therefore in securing the test cells there could have been space left for outside sound to come through. This in turn would lead to inaccurate results. In sealing the impedance tube, caulking and household glue was used. In constructing the tube using these materials, sound could have possibly leaked out. The sound level meter has an accuracy of plus or minus two decibels, which could have some bearing on the recorded results.

As with any research there is always ground for further research. The test cells that were sampled were limited. There are other materials with sound reducing capabilities that were not included in this particular study. Also, the test cells that were studied could be put together in another order that could possibly lead to greater sound reduction. This research project could have also been deeper in nature by observing in what manner sound is absorbed or insulated within the test cells.

CONCLUSION AND ACKNOWLEDGMENTS

The study of sound reduction is a very difficult one. Physicists and Acoustical Engineers struggle with this type of research on a daily basis. The time given for this research was limited and therefore all of the compiled information was not researched as in depth as needed. With this particular research project, some interesting questions were raised and answered. This study has given an insight into sound reduction and how it can be used in everyday life. It is my hope that I will be able to use the information from this study to improve my listening environment.

In conclusion, I would like to thank my mentor Dr. Williams for all of his help with this research project. Without his assistance, this project wouldn't have been possible. I would like to thank the other individuals who supported me and aided me in this effort. I would also like to thank the McNair program for allowing me to participate in their program for the summer. It is my genuine hope that I and this program will continue to be successful.

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Maintaining Doctrinal Integrity and Continuity in the Absence of Organizational Structure Among Primitive Baptists

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Abstract:

This study will attempt to discover the manner of maintenance and continuity of distinctive doctrines belonging to the primitive Baptist denomination of protestant Christianity. Primitive Baptists have never been organized as a denomination and they lack administrative bodies such as many churches have. The project will examine to what degree the doctrines have been maintained within a denomination that desires to maintain them, but on primary principle has no established structure for ensuring doctrinal integrity and continuity. The focus of the study will be the largest primitive Baptist church in the world located in Statesboro, Georgia, and will include two other local churches, one of each branch of the primitive Baptists: Progressive and "Old Line" congregations. Areas of interest include church history, church doctrine, pastoral ministry, education, church discipline, and the degree to which members are aware of and believe in the cardinal doctrine, pastoral ministry, education, church discipline, and the degree to which members are aware of and believe in the cardinal doctrines of local congregations.

Information gathered from this study will contribute to the body of knowledge within the scope of religious studies and will provide a brief history of the congregations participating in the study.

Most denominations have a clearly organized structure by which they maintain the dissemination of doctrine and church policy. This often includes a denominational headquarters housing church leadership and support staff; a publishing company; a media division to coordinate and produce music, videos, and television programs; annuity and retirement boards for ministerial staff; and a public relations organization. The Primitive Baptists have no such structure. The focus of this research is to ascertain how Primitive Baptists maintain their doctrine without a denominational structure.

Doctrine

Primitive Baptists regard themselves as the group that has maintained doctrinal integrity from the inception of the Christian Church. They call themselves "Primitive" because they believe that they hold the doctrines of the New Testament Christians.¹ They claim that opposing groups separated from them in order to espouse new or different doctrines. The Primitive Baptists cling to their doctrines at the expense of losing members to

offshoot groups that hold some of the same doctrines. The main Primitive Baptist doctrines are the principles of Calvinism, the autonomy and authority of the individual congregations, and baptism by immersion.

In common with most of the Baptist groups, Primitive Baptists insist on baptism by immersion because Jesus was baptized by immersion. They find an historical champion for the practice in Tertullian, who in *De Baptismo* describes baptism as "being plunged under water."² The doctrine of baptism by immersion became an identifying mark of the group subsequently identified as Baptists. Some Christian groups began to substitute sprinkling, or affusion, for immersion due to the unavailability of adequate water sources.³ Although scripture provides evidence for baptism by affusion,⁴ the Baptists maintain that this was an exception rather than the rule for early church baptismal practices. Some adopted sprinkling for infants, but Baptists believe that baptism is symbolic rather than efficacious and that it is reserved for those with sufficient maturity to understand the profession of faith. Other doctrines gained prominence as historical events produced religious controversy.

Another division occurred as the result of the persecution of Christians under the Roman Emperor Decius in A.D. 249. Decius issued an edict

²Schaff, vol 1, 261.

³Schaff, vol 1, 247-249.

⁴Acts 2:41; 16:33

¹Melton, 63.

in an effort to unify the empire by requiring that all subjects practice pagan worship.⁵ The edict split the churches as hundreds were martyred and many apostatized to avoid death. The persecution was both intense and abrupt. The church leaders were eliminated first, leaving the congregations without encouragement during their ordeal. Many of the Christians who did survive did so by recanting their faith or sacrificing to the Roman gods. They were called the *lapsi*, the “lapsed” or fallen-away Christians.⁶ Those with means were able to secure “*libellatici*,” or certificates that stated that the believer had renounced faith in Christ, even though he or she had not actually done so, in order to avoid being killed.⁷ Following the abatement of the persecution, many of those who had left the church pleaded for restoration.

When these lapsed believers attempted to reunite with local congregations, they found that many of the survivors did not want to accept them back into fellowship. Novatian, a Roman presbyter, insisted that those guilty of mortal sins (apostates, as well as murderers and adulterers) could not be accepted back into fellowship.⁸ Novatian was concerned with the purity of the church, and his group was subsequently called the *Cathari* (the Pure). He believed that the character of the Christian must match the teachings of Jesus, and he raised the question of whether one who committed apostasy was a true Christian. This in turn raised the question of who were the saved. Novatian turned this discussion to predestination and free will,

asserting that God had chosen certain people to be among the elect, and that the elect would persevere in the faith without lapsing or backsliding. He took a pure life as an indication that a believer was among those foreordained by God to be saved.⁹ He understood this to eliminate anyone who committed apostasy.

Augustine’s discussion of the depravity of man contributed to the further development of the Novatianist position. Pelagius claimed that man was naturally good and had the freedom to choose good over evil.¹⁰ In response, St. Augustine wrote *The City of God*, in which he made use of Paul’s claim of the total depravity of man.¹¹ According to Paul, since Adam sinned, his descendants are unable to please God in any way.¹² Paul stated that all men are desperately wicked, because they are under the complete control of their fallen nature.¹³ Augustine insisted that because of his fallen nature, man cannot choose or love the good apart from the grace of God.

The Novatianists espoused this doctrine of the total depravity of man and spread their teachings throughout the Mediterranean area. The Lateran Council of 412, and the councils of Arles and Lyons in 455, denounced Novatian’s doctrines of baptism and predestination.¹⁴ At this point, the main body of Christians diverged from the teachings of Paul. In response to the church councils, the Roman Emperor Theodosius, began to persecute the Novatianists,

forcing them to seek a refuge for their faith elsewhere.

The oppression of the Novatianists pushed them into the valleys of the Piedmont, where they were called “Waldenses,” for the wooded area in which they settled. They acquired other names as the persecution drove them into other areas: Lollards in Holland, Vandals in France, Navarri in Spain, and English Baptists in England. In response to the persecutions initiated by the church councils, the Novatianists emphasized the doctrines of 1) an independent form of church government, each church complete within itself; 2) freedom of conscience and opposition to the union of church and state; 3) the acknowledgment of the scriptures as the only rule of faith and practice.¹⁵ These were in addition to the doctrines regarding baptism and predestination: the rebaptism of all who came to them from any church that was not in fellowship with them, the baptism by immersion upon a profession of faith, no infant baptism, and predestination.¹⁶

Under their various names, the Novatianists became a formidable threat to the established Roman Church and refused to submit to the power of the pope. Some of their doctrines would become prominent during the reformation, when John Calvin would adopt and popularize them. In 1560, both Pope Pius II and a Catholic bishop, Lindanus, termed John Calvin, “the inheritor of the doctrine of the Waldenses.”¹⁷ Years before the official

⁹Brown, 197-199.

¹⁰Brown, 196.

¹¹Augustine, 82.

¹²Romans 5:12.

¹³Romans 7:7-24.

¹⁴J.V. Kirkland and C.B. Hassell, (7).

¹⁵J.V. Kirkland and C.B. Hassell, (7)

¹⁶J.V. Kirkland and C.B. Hassell, (7)

¹⁷J.V. Kirkland and C.B. Hassell, (7)

⁵Schaff, vol 1, 60.

⁶Schaff, vol 1, 79.

⁷Schaff, vol 1, 189.

⁸Schaff, vol 1, 189.

Reformation began, the Waldenses were already evangelizing and proclaiming what would become the five principles of Calvinism. In England, the Novatianists encountered another controversy. A major division within the English Baptist camp occurred during the 17th century when John Smyth¹⁸ joined the Separatist movement and converted many to his views. Smyth proposed a modified version of Arminian doctrine which rejected the doctrine of unconditional election. Smyth's position focused on the free will of man and his ability to choose whether or not to follow Christ. Smyth proposed that because of man's free will, he can choose to accept salvation or to reject it. Atonement was not limited to the elect only, but was for the whole world. The responsibility then fell to the individual to make the right choice. Followers of Smyth divided off and formed the General Baptists, who believe in a general salvation rather than a particular one of only the elect. The differences between the groups were the Particular Baptist's devotion to the five points of Calvinism and the General Baptist's emphasis on free will. Hassel reports that by the close of the seventeenth century there were probably, in England and Wales, about two hundred Baptist Churches with about twenty thousand members. There were in the present United States sixteen churches.¹⁹ Of the sixteen churches in the colonies, only a few were Arminian.²⁰ Most (like the first

¹⁸Mayer, F.E., 248-263.

¹⁹Hassell, 525.

²⁰Melton, 63.

Baptist Church in America, in Newport, Rhode Island) were strongly Calvinistic and predestinarian. They also maintained the doctrine of the autonomy of the local church and resisted hierarchical organizational structure.

The next major division came over the question of missionary activity. In 1792, Dr. William Carey established a missionary society at Kettering, England.²¹ The purpose of creating this society was to enable independent church bodies to cooperate in a universal missionary effort to win the lost. Many Particular Baptists saw the missionary movement as one that challenged their basic doctrines. They viewed missionary efforts as unnecessary in light of the doctrine of election.²² Their reasoning was that if God had elected a specific number of people to be saved from the foundation of the world, then missionary efforts were of no value. Those who were the elect, and predestined to eternal life by God's irresistible grace would be saved regardless of the efforts of any missionary society. Secondly, they saw the establishment of a missionary organization to be a threat to the autonomy of the local church congregation and its ability to govern itself. Because of the severe persecution that Baptists had faced under the Church of England, even in the colonies, the Baptists were very sensitive to any organization that might usurp the authority and autonomy of the local church.²³ They viewed organization as a first step to the marriage of church and state.

The group of Baptists who

²¹Mayer, 249.

²²Black Rock Address, 5.

²³J.V. Kirkland and C.B. Hassell, (7)

branched off and followed Carey became known as Missionary Baptists. The Primitive or Particular Baptists, identified for their lack of participation, were tagged "Anti-missions Baptists."²⁴ The Anti-missions Baptists were concerned that the Arminianism of the General Baptists would corrupt the Paul's doctrines of the faith. In the late 1820's, the contentions between the various Baptist groups reached a fever pitch and new fractures began to develop in Baptist fellowship.

In response, a group of leaders from the more traditional, Anti-mission faction of the Baptist groups, met in Black Rock, Maryland, in 1832 to address the issues that had stirred the dissent. The document that resulted from that meeting is known as the "Black Rock Address."²⁵ The statements made in the "Black Rock Address" were pivotal to the departure of other Baptist groups from the Primitive Baptists. The basic premise of the Primitive Baptists against Missionary societies, Bible and Tract societies, and Sunday Schools was the fact that the New Testament did not specifically establish those kinds of organizations, and the only institution recognized by the early church was the local, autonomous congregation of believers.

In effect, the Black Rock Address endorsed Martin Luther's cry of "*Sola Scriptura*" (scripture only). If it was not in the New Testament, it was not going to be part of the Primitive Baptist faith or practice. Arguing from this principle, the elders referred often to five principles

²⁴Lambert, 130-131.

²⁵Beebe, B.L., Feast of Fat Things, (Middletown: G. Beebe's Son, Publishers, date unknown).

(generally known today as the Five Points of Calvinism) as a summary of the doctrines proposed by Paul in his letter to the Romans, and relied heavily on Augustine and Calvin for proper interpretation of those doctrines. They used these doctrines to defend the Anti-mission position. The first point is the doctrine of the total depravity of man (as discussed above), which states that all men are born in a condition of spiritual death due to original or Adam's sin. Man, in this state, has no desire to seek God or do good. He is incapable of performing any spiritual activity on his own that might result in his obtaining eternal life (e.g., belief, baptism, etc.).

Another key doctrine is unconditional election, that all who are to possess eternal life were individually chosen by God before creation to receive such life. This choice was not based upon any merit seen or foreseen in the elect; rather, this election was motivated by the sovereign love of God. For the Primitive Baptists, the belief in Christ and obedience to his commandments are the consequences, or fruit, of election; therefore, they believed that all such persons could be identified as possibly among the elect. True to their Calvinistic roots, however, Primitive Baptists maintain that one cannot know for sure if one is among the elect.²⁶

The third principle is the doctrine of limited atonement. The saving benefits of Christ's death were intended for the elect only. The Primitive Baptists do not believe that Christ died for all, but that he died for the elect only.

Irresistible grace is the belief that all of the elect will be quickened by the Spirit of God at

some point in their lives. The premise here is that man would resist the spiritual birth if he could, due to his totally depraved nature. Therefore the life-giving power of God must be imposed upon the one who would be saved, i.e., the elect. Primitive Baptists use the encounter of Paul on the road to Damascus as an example of this doctrine. The grace of God is irresistible because God's power cannot be resisted.²⁷ The saved cannot resist the work of the Holy Spirit upon his spirit and must respond.

Because God has elected some to eternal life, the doctrine of the preservation of the saints is inevitable. What God has done cannot be undone.

As one may deduce, missionary organizations and Bible and tract societies are in direct opposition to the doctrines stated above. There is no need to evangelize the lost, and those who are among the elect will be saved. The Primitive Baptists therefore rejected the pleas of the missionary societies for funds and workers and considered their methods manipulative.²⁸

In addition to refusing any organizational structure, Primitive Baptists do not sponsor or advocate any formal training for their ministers. Ministers are raised up within local congregations as the members or the candidate himself recognizes a ministry gift. Often the ministers are laymen who have taught themselves the Bible and the precepts of the church. In the best situations, the candidate is mentored by an elder and eventually is called to pastor by a sister church. The requirements for preachers are to receive a call from God to the ministry, and to

have that call confirmed by the church body with an ordination.

Today, there are three major divisions among those who call themselves Primitive Baptists. The groups are the Old Line Primitive Baptists, the Progressive Primitive Baptists, and the Absolutist Primitive Baptists. The differences between the Old Line and the Progressive groups are not doctrinal, but matters of preference in the manner of worship, the existence of Sunday Schools, and the frequency of church meetings. Both groups are predestinarian and closely follow Calvinist principles. The Old Line group does not offer Sunday School classes or use musical instruments in the church services because neither is specifically mentioned in the New Testament. The Progressive group maintains Sunday School classes for all ages and uses musical instruments. The Absolutists deny free will in any situation, holding to a deterministic view of not only salvation but daily life as well. In this view, because of the complete sovereignty of God, no free act is possible.

Maintaining Doctrine

On the local level, doctrinal integrity is maintained by the presentation of doctrine within pastoral sermons; hymns; and for the Progressives, Sunday School lessons. Both the Sunday School class and the pastoral sermon expounded doctrine, especially the doctrine of election. Also, churches often exchange ministers during times of special meetings or revivals. This exchange serves a dual purpose: it maintains a loose system of doctrinal purity tied to the consensus of each local church and provides an opportunity for apprentice pastors

²⁷J.V. Kirkland and C.B. Hassell, 9.

²⁸Beebe, 14-17.

²⁶Doctrinal Abstract, 3.

to demonstrate their ability to exercise their ministry gift.

In addition to the ministry, local churches publish newsletters and journals, the most popular being the *Advocate Messenger*. Each journal or newsletter is produced at the local level. Some of these journals are *Amazing Grace Library*, Indiana; *Arizona Primitive Baptist*; *The Baptist Witness*, Ohio; and *Bonds of Love*, Texas. In addition to reviewing the social issues of the church, the journals serve to reinforce doctrinal issues.

Each individual body also prints its own Articles of Faith and Practice. Because the statements of other churches within the association often serve as a guide, the statements are very similar in content. Variations of the statements may include specific items of church discipline, church covenants, and constitutional points unique to the local body, but doctrine is consistent.

Radio broadcasts also convey doctrine. The Baptist Bible Hour, under the direction of Elder Lasserre Bradley, is nationally syndicated and provides a means for unifying Primitive Baptists throughout the country. Other important programs exist as well: Old School Baptist Broadcasts with Elder Samuel Bryant, and the Tidewater Primitive Baptist Church with Elder Ed Kirkpatrick.

Being primitive does not exclude the use of contemporary technology. Elder David Pyles has incorporated the latest technology in preserving and disseminating Primitive Baptist doctrine. He is the administrator of a state-of-the-art web site²⁹ that includes substantial materials on Primitive Baptists, and features

links to the web sites of various Primitive Baptist churches.

Conclusion

Primitive Baptists have been successful in preserving what they deem to be the doctrines of the New Testament church. The primary method of preservation has been the proclamation of key doctrines from the pulpit at the local church level and the printing of Articles of Faith for members. The Progressive group includes weekly Sunday School lessons to teach and explain the doctrines. Primitive Baptist doctrine is also reinforced by newsletters, journals, radio broadcasts, and local church web sites. The agreement among the sources of doctrinal exposition contributes to the success of the organization in guarding doctrinal purity.

Continuation of Project

Research to this point has consisted of establishing doctrine and searching for the mechanisms of maintaining that doctrine. Due to the four-week time constraint, further research on this subject is necessary to complete the project. Further investigation will be made into the following:

- Hymnals and other church music
- Church publications
- Associational ties
- Old Line and Absolutist congregations
- Articles of Faith

There will also be additional on-site visits and interviews with church leaders

²⁹<http://www.pb.org>

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Analysis of the Competition in the Chemostat When One Competitor Produces a Toxin

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Abstract:

This analysis of the chemostat provides both mathematical and graphical proof of the conclusions drawn by biologists. The situation in the chemostat is that one of the competing organisms is producing a toxin that eliminates the other. By assuming different values for six constants and finding what k -value would give us all negative eigenvalues, we found under which circumstances the toxin-producing and toxin-sensitive organisms live. We discovered that the larger the value of k , the faster the toxin-producing organism eliminated the toxin-sensitive one. We also concluded that at no time could both of the organisms co-exist. Under certain parameter values, we found an interval of k -values where the toxin-producing organism survived while the toxin-sensitive organism was eliminated.

1. Introduction:

This paper analyzes the competition in the chemostat when one competitor produces a toxin. The chemostat is a system of three vessels. The first is the nutrient vessel. In this vessel is placed one nutrient that is essential to the survival of two organisms. These two organisms are placed in the second, or culture vessel. The culture vessel also contains, in abundance, everything these two organisms need to survive, with the exception of the one essential nutrient. In this vessel the two organisms must compete, in a completely exploitative manner, for the nutrient. The third vessel is the overflow vessel. This vessel is in place so that the contents of the culture vessel can be washed out at a certain rate. Important assumptions in the chemostat problem are: that the temperature, pH, and the like are kept constant in the culture vessel, that the culture vessel is well-mixed, and that the wash-out rate is sufficient to prevent any wall growth in the culture vessel. The assumption that the culture vessel is well mixed plays an important role in one of the conclusions. The chemostat has applications in many fields. In ecology, it is the model for a simple lake. In chemical engineering, it is the laboratory model of a bio-reactor which uses genetically altered organisms to produce an item. The chemostat is also the starting place for modeling a waste water treatment plant and models the large intestines in mammals. These applications justify the study and analysis of the chemostat.

In the situation we examined, one of the two

organisms produces, as a by-product, a chemical that is toxic to the other organism. The value of k represents the possible growth given up by the toxin-producing organism in order to produce the toxin. This constant is needed since some of the nutrient obtained by the toxin-producing organism must be used in the production of the toxin and not used for reproduction. In our study we found that for all of the parameters we assumed, there was a value of k that allowed for the toxin-producing organism to live. However, at no time can both the toxin-producing organism and the toxin-sensitive organism co-exist.

2. Model:

The model we used was found in [1] written by Hsu and Waltman. The model is of the form

$$\begin{cases} S' = (S^{(0)} - S)D - \frac{m_1 S}{a_1 + S}x - \frac{m_2 S}{a_2 + S}y \\ x' = x \left(\frac{m_1 S}{a_1 + S} - D - \omega P \right) \\ y' = y \left((1-k) \frac{m_2 S}{a_2 + S} - D \right) \\ P' = k \frac{m_2 S}{a_2 + S} y - DP \end{cases}$$

At any time t , the solution of this system of nonlinear ordinary differential equations, gives the concentration of the nutrient in the culture vessel, $S(t)$, the population of the toxin-sensitive organism, $x(t)$, the population of the toxin-producing organism, $y(t)$, and the concentration of the toxin in the culture vessel, $P(t)$. In this model $S^{(0)}$ represents the initial

concentration of the nutrient in the culture vessel, μ represents the washout rate, m_i is the maximal growth rate for the organism with $i=1,2$, a_i representing the Michaelis-Menten constant (or the metabolic rate) with $i=1,2$, and γ_i is the yield constant. In this model, $k=0$ corresponds to the original chemostat and $k=1$ means that all of the efforts of the toxin-producing organism are devoted towards toxin production.

3. Procedures:

To begin the project, we assumed values for all of the constants with the exception of k . Because m_i is the maximal growth rate, we knew that it must be on the interval $[0,1]$, and that a_i had to be on the interval $(0,\infty)$. Using our assumptions we found the equilibrium points in order to linearize the system of nonlinear equations. Upon determining these equilibrium points we found that two of the four were uninteresting to us. If stable, the first equilibrium point indicates that the population of both x and y approach 0 while the third equilibrium point shows that the population of y approaches 0. Therefore, the only two equilibrium points we studied are the second and the fourth in which, if found to be stable, eliminated x while y survived and allowed for the survival of both organisms, respectively.

Linearizing the nonlinear system about the second and fourth equilibrium points gave us a matrix with k as the only variable. Finding the eigenvalues for this matrix enabled us to find an equation for each eigenvalue that was solely dependent on k . We then determined for each equation the interval of k so that the four eigenvalues were negative. Because if $\lambda_i < 0$ for $i=1,2,3,4$ the equilibrium point is stable. This means that populations approach

the coordinates of this point as t increases. If the concentrations of the four variables remain at a single point, then we can determine what constant values brought the concentrations to that point.

For the second equilibrium point, we were always able to find a k -value that made $\lambda_i < 0$. Which means that for every set of parameters we tried there is a situation where the population of y is asymptotic to a positive number, while the population of x approaches 0. However, in the case of the fourth equilibrium point, we could not find any value of k that allowed for each λ to be negative. This means that the fourth equilibrium point is unstable and would not yield a situation in which y approaches a constant value.

4. Conclusion:

One conclusion we were able to draw from this analysis is that x and y cannot co-exist. This result is conclusive with that of [2]. In this paper the authors conclude that the two organisms in a chemostat cannot co-exist as long as it is assumed that the culture vessel is well mixed. We could not immediately apply their findings to our analysis because of the introduction of the toxin.

We also found that under certain conditions there does exist a k -value that allows for y to live. However, the smallest k -value we found, under the conditions we assumed, that provided for y to live is .75. This means that 75% of possible growth had to be given up by y in order to eliminate x .

5. Discussion:

Possible points for further research or analysis on this problem include the possibility of k not being a constant value. If the toxin-producing organism were able to initially produce a large quantity

of toxin, sufficient to eliminate the toxin-sensitive organism, and then slow or stop production of the toxin, would there be any parameters in which the toxin-sensitive organism could live? Another interesting question is whether there are any parameters that would prohibit the toxin-producing organism from living, regardless of the value of k ? Continuing evaluation of these questions could give valuable insight into the chemostat problem and its applications.

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Citizen Participation in Public Administration: Purpose and Possibilities

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Abstract:

This paper investigates the concept of active, meaningful citizen participation in public administration and the role it may play in lessening the depth and intensity of citizen antipathy toward government. The philosophical foundations of citizen participation are considered using three communitarian precepts: civil society and the public sphere, social responsibility, and democratic deliberation and decision-making. Current research on the value of authentic citizen participation is reviewed. Evidence of citizen attitude change as a result of participation is found to be anecdotal or indirect, and future research is recommended to survey citizens, as opposed to elites, whose attitudes have changed after involvement in authentic participation.

Introduction

I was talking with a political science graduate student one day about our academic and professional aspirations. When I said that I hoped to get a master's degree in public administration, and then go on for a doctorate in the same field, her lip curled and her eyes rolled. She said that she "hated bureaucrats" and didn't know why anyone would want to work for the government. She, on the other hand, planned to become a college professor. I cringed when I thought of the attitudes she would impart to her future students. I reminded her that public agencies and the people who work in them are probably the key point of access to the government for citizens—a crucial component of democracy. She was adamant and said that she could never work for the government because she is not "naturally deceitful." I was saddened and frustrated by this interaction, but the stronger outcome for me was an intensification of my determination to try to *do something* about this far-too-prevalent public opinion.

Since the 1960s politicians and public administrators have become increasingly aware of growing levels of citizen mistrust and anger toward their government (Berman 1997; King, Feltey and Susel 1998; King and Stivers 1998; Rimmerman 1997; Zanetti 1998). Statistics gathered recently from public opinion polls give a grim picture of how citizens feel, revealing that "nearly 70 percent of the public now believes that something run by the government is usually

inefficient and wasteful, that the federal government controls too much of our daily lives, and that dealing with a government agency is often not worth the trouble" (Tolchin 1996, 8-9).

How did these people learn to hold such cynical and mistrustful views of their government? Does our educational process reinforce these negative perceptions? More important, is there any way to change their minds? Though the first two questions may help get at the root of some forms of citizen aversion for government, the focus of this study is the third question. I will look at the concept of active, meaningful citizen participation in public administration and the role it may play in lessening the depth and intensity of citizen antipathy of the sort displayed by my young colleague. I begin with a search for the philosophical underpinnings of the idea of citizen participation.

The Philosophical Background

Some social and political theorists complain about a decline in the health of our non-governmental community and neighborhood institutions, that realm of associational life commonly referred to as "civil society." Influential and thoughtful scholars and public servants from all sides—such as Charles Taylor, E.J. Dionne, Jr., Jean Bethke Elshstain, Robert Putnam, John McCain, Bill Bradley, Colin Powell and Bill Clinton—warn us of the need to foster robust civic education as a means of improving our quality of life and the quality of our

government institutions (Dionne 1998; Elshtain 1995; Etzioni 1995; Frohnen 1996; Taylor 1995; Wolfe 1995).

With so many of our academic and political leaders calling for revitalization of our communities and civic spirit, I am struck by the similarities in their concerns and in their solutions. There must be a common philosophical thread that weaves its way past partisan lines and ivory tower separateness to tie all these thinkers together. A review of the literature reveals that several precepts of *communitarianism*, a social and political philosophy that has gained some prominence in the past 20 years, provide a sound philosophical foundation for these calls to civic action. A full examination of communitarianism would be beyond the scope and purpose of this study, but several of its key principles directly relate to the present research. I will look briefly at three communitarian concepts: civil society and the public sphere, social responsibility, and democratic deliberation and decision-making.

Civil society and the public sphere

Canadian sociologist Charles Taylor explains that the public sphere is “the locus of a discussion potentially engaging everyone...in which the society can come to a common mind about important matters” (Taylor 1995, 190). The public sphere has historically been considered to be outside of, but normative to, political power and is intended to inform the decisions of our political representatives. Taylor suggests that since the 18th century the public sphere has changed its shape and become, rather than a “unitary space,” a collection of “nested” public

spheres that represent a spectrum of local debates and national social movements such as feminism and environmentalism (Taylor 1995, 207-9). Taylor asserts that in a pluralistic, liberal society the “public sphere cannot be seen only as a social form limiting the political but as a medium of democratic politics itself” (Taylor 1995, 216).

But where is this public sphere, exactly? How do I get there and when does it meet to engage in these important discussions about the common mind? In his essay “Virtue and Democracy” (1995), David Hollenbach, S.J., suggests that in free societies such conversations will take place in “those components of civil society that are the primary bearers of cultural meaning and value. These include universities, religious communities, the world of the arts, the sphere of serious journalism... It occurs, in short, wherever education about and serious inquiry into the meaning of the good life takes place” (Hollenbach 1995, 151). While I agree that these scholarly arenas make vital contributions to the “common good” discussion, I also say that ordinary people make these decisions in ordinary circumstances. Crucial conversations about “the good life” and what that means happen at PTA meetings, at the labor bargaining table, or at the local high school where a volunteer citizen advisory group meets two nights a month, squeezing themselves into student desks to discuss the implications of a certain public policy to their community. The time and place for common good discussions is not necessarily determined by someone else, someone more educated or “in charge.” They take place in civil society.

Bill Bradley explains that civil society is where Americans actually live, day-to-day. When it is in good health, civil society provides the institutional structures we need to develop strong relationships, make difficult community decisions, and educate our children. Bradley suggests that civil society is “where opinions are expressed and refined, where views are exchanged and agreements made, where a sense of common purpose and consensus are forged” (Bradley 1998, 108). It is our schools and universities, labor unions, PTAs, sports leagues, garden clubs, places of religious worship, and neighborhood watch groups.

Social responsibility

In a liberal democratic society where individual rights and civil liberties are supreme, do citizens also have social responsibilities that extend beyond that of doing no harm to others?

Jean Bethke Elshtain suggests that the American focus on individual rights formally began with the Bill of Rights as a perfectly appropriate concern about and shield against overweening government power. The civic responsibility features of citizenship that were also important in our nascent country balanced the emphasis on rights so that civil society was generally healthy. But over the years, with industrialization and an extreme emphasis on consumerism, individualism gained prominence in our social and political interactions: “[A]s time passed, the rights-bearing individual came to stand alone—‘me and my rights’—as if rights were a possession. Rights were construed increasingly in individualistic terms as their civic dimensions withered on the vine”

(Elshtain 1995, 15). With the decline of civil society comes a tearing of the social safety net it traditionally provides. There is no choice but to look increasingly to the government to solve the overwhelming social problems that private networks of associations may have taken care of in the past. Elshtain writes,

As our sense of particular, morally grounded responsibilities to an intergenerational web and a world of friends and neighbors falters and the state moves in to treat the dislocations, it may temporarily solve delimited problems. But these solutions may, in time, further thin out the skein of obligation. Eventually, support for the state itself will begin to plummet—people feel anomie and aggrieved, their resentments swell... (Elshtain 1995, 19).

An additional consequence of a reduced sense of civic responsibility is a growing feeling of social fragmentation. According to Taylor, that fragmentation causes people to fail to identify with their community or to feel "bound to their fellow citizens in common projects and allegiances." Because of the late 20th century growth of identity politics as a way of securing "rights," individuals may actually feel intensely linked to certain fellow citizens, "but these come more and more to be partial groupings rather than the whole society" (Taylor 1995, 211). Taylor suggests that in this environment, bonds of sympathy across identity-divides tend to weaken to the extent that we may fail to recognize the commonalities we

share as members of a community. It becomes increasingly difficult to "mobilize democratic majorities around commonly understood programs and policies" (Taylor 1995, 211). No common experience of action leads to a sense of hopelessness and defenselessness against "the state," which leads to further inaction as citizens give up trying.

Communitarians argue that for the sake of the health of our democracy we citizens do have civic duties and responsibilities. We must not become so mired in our own self-interest that we fail to do our part in shaping the direction of our government and the public policies that affect us all (Elshtain 1995; Fowler 1995; Frohnen 1996; Lawler and McConkey 1998; Taylor 1995).

In *The New Citizenship* (1997), Craig A. Rimmerman explores the limits, virtues and possibilities of citizen participation in the American republic. Rimmerman asserts that modern Americans may not normally be taught to value civic participation:

From the vantage point of participatory democrats, the political socialization process impedes meaningful and effective participation because citizens are socialized to embrace the values of privatism and radical individualism that are rooted in liberal democracy. Indeed...the thrust of political socialization in America reinforces the underlying tenets of the democratic theory of elitism, tenets that highlight the passivity of the citizenry and that allow elites in power to make the

crucial decisions that affect the quality and direction of the people's lives (Rimmerman 1997, 17).

Rimmerman later explains that if we are able to shift our consciousness toward assuming more civic responsibility, our sense of political efficacy will dramatically improve. This will ultimately have the effect of giving *citizens* greater control over the many public policy decisions that affect their lives: "In so doing, participatory democracy challenges the fundamental assumptions of leadership and followership associated with the political system" (Rimmerman 1997, 23).

Democratic deliberation and decision-making

Some may argue that, though imperfectly, our current system does reflect principles of democracy for the abundance of interest groups and issue networks that provide a wide assortment of perspectives and wishes to our policy makers (Berry 1997). Other research shows, however, that while issue networks and the natural flux of interests they entail do function in the policy- and rule-making process at the federal level, the interests of business tend to dominate against "the virtual absence of actual citizen participation" (Golden 1998, 265).

An important communitarian principle is that of active citizen participation in the process of deciding community objectives and public policies (Elshtain 1995; Spragens 1995; Taylor 1995). In a refreshingly hope-filled essay on the state of civil society, Pam Solo and Gail Pressberg remind us that many

vital community groups currently exist, challenging the notion that civil society is all but dead. These groups embody the shared communitarian values of democratic deliberation and citizen participation in government:

[T]he best government policies have emerged from collaborative efforts among government, community institutions, and the private sector. Enduring social changes are not simply legislated by government. They arise from social action rooted in individual responsibility and accountability (Solo and Pressberg 1998, 86.)

Emphasizing the communitarian value of democratic decision-making, Taylor asserts that the public sphere is “essential to democracy” for its value as an arena for stakeholders to feel they have been heard in any given policy debate. Taylor outlines three conditions of democratic decision-making: first, that the people involved understand themselves to be members of the community and thereby bound or affected by the final decision or outcome; second, that all parties involved feel that they have been truly heard, even if their demands are not actually met; and third, that the final outcome or decision is actually reflective of majority preference, which it can only be if all affected are heard (Taylor 1995, 204-6). Taylor reminds us that the basic factors of liberalism’s goals—freedom, self-government, and a rule of right founded on equality—require that our politics include the “conditions of genuinely democratic common decisions, and that the public sphere [be

seen] as a medium of democratic politics itself” (Taylor 1995, 216).

Communitarians would have us engage in public deliberation and democratic decision-making mainly because these activities help to create a responsive citizenry and government, as well as a more healthy democratic civil society (Elshtain 1995; Fowler 1995). Following Charles Taylor and Robert Bellah, Bruce Frohnen explains that unless we see ourselves as active participants with authentic political efficacy, “we will no longer view the community as the product of our own will. And once we see the community as something other than our own creation we no longer will value or seek the common good” (Frohnen 1996, 125).

Communitarianism as Philosophical Underpinning

Many public administration scholars who study and/or advocate citizen-government collaboration use the language and principles of communitarianism without specifically naming the philosophy (Berman 1997; Grisham 1999; King, Feltey and Susel 1998; King and Stivers 1998; Koontz 1999; Marshall et al. 1999; Mathews 1994; Stivers 1994; White 1990; Zanetti 1998). I believe there is value in locating and naming an underlying social theory or philosophy when examining practical political issues, if for no other reason than to have a common point of reference for the sake of continuity in our public policies. As a student of political science, I feel it is important to validate with theory what seems, on the surface and at the practical level, to just make sense.

The communitarian precepts examined here—civil society and the public sphere, social responsibility, and democratic deliberation and decision-making—have clear implications for citizen participation in public administration, though they are not meant to fully represent the ways in which communitarianism may inform the discipline. In addition, it may be argued that other philosophies or social theories fit equally well. As E.J. Dionne, Jr. wrote:

[M]any community works are being performed by people who don’t much care whether they are labeled ‘communitarian’ or not. You don’t have to be communitarian to care about community. You don’t have to engage in the debate over civil society to build it.

But if a society wants to encourage those who are engaged in the hard work of forging community bonds, of building civil society, it needs to be aware of how important that work is and to honor those who do it (Dionne 1998, 3).

I turn now to those people—scholars, public administrators, and citizens—who study, support, and engage in citizen participation. My purpose is to determine whether or not active participation in public administration has the effect of ameliorating citizen antipathy.

Practical Citizen Participation

Federal and state governments began to respond after the 1960s and 70s to clear messages from the public that

more accountability was desired (King and Stivers 1998, 6-17). Mandates requiring agencies to demonstrate efforts at citizen participation were imposed, sometimes with mostly positive effects, like in the case of the Environmental Protection Agency (Kovalick and Kelly 1998), and other times with results that were neutral or negative (Naples 1998). In 1983, public administration scholars in Georgia looked at the realities of citizen participation:

Citizen participants help to meet federal and state requirements, yet they are a nuisance and a potential threat to program stability. Recognizing their enacted role, participants develop a sense of mission and their own importance. Officials may support their sense of importance to a point and then hold it in check. The function of the citizen participant, then, is marginal. The promise of influence is greater than actual influence, and citizens sit at the margin between real power and powerlessness.” (MacNair, Caldwell and Pollane 1983, 511-12)

Not surprisingly, citizens report feeling “pushed out” of the process by administrators who do not value the contributions of citizens, nor have confidence that “the public” is capable of understanding the complexities of policy development and implementation (Gray and Chapin 1998; King, Feltey and Susel 1998). Citizens who remain motivated to involve themselves, despite feeling unwelcome, may then tend to resort to confrontational tactics of

participation (King, Feltey and Susel 1998, 319).

Additional research shows, however, that most administrators understand the need for citizen input into the process and would like to find ways to make it work (King, Feltey and Susel 1998). Though involving citizens in the policy formation process may be more expensive and time-consuming initially, administrators understand that policies and programs developed in this way are more readily implemented because of the consensus that is gained through inclusion of all affected parties. In addition, and not to be diminished, many public administrators go into “public service” because they have some conviction about the democratic ideals it promotes, and they truly want to help meet the needs of the community (Berman 1997; Chrislip and Larson 1994; Fesler and Kettl 1996; King, Feltey and Susel 1998; Marshall et al. 1999; Stivers 1994).

Research has recently been conducted on ways to make citizen participation in public administration much more meaningful and productive for everyone involved. Public administration professor Lisa A. Zanetti points out that public administrators are in the unique position of simultaneously being considered outside of government and outside of civil society. In this nether-region role, these public servants have some administrative discretion, which makes them prime candidates to be “agents for transformation” of those aspects of public administration that are exclusionary and hegemonic (Zanetti 1998, 111-2).

Zanetti looks at the practice of law to find a useful strategy for public administrators who wish to transform the field.

“Critical lawyering” uses critical legal theory to gain “insight into the nature of client disempowerment and to politicize the legal process toward the goal of substantive equality.” Critical lawyering stresses the importance of client participation in the process by involving them in “framing the question, developing strategy for change, learning how to use the system to effect change, and obtaining skills that can be used in the future.” In these ways, critical lawyering helps to deepen the political consciousness of subordinated or socially marginalized groups. Using a modified critical lawyering model, Zanetti suggests that enlightened public administrators may use a critical theory approach to change processes and encourage citizen involvement. She identifies five tenets of transformative public administration:

Humanize:

Resist the tendency to reduce citizen experiences and stories to quantitative trends. Frame issues in human terms.

Politicize:

Use political theory to provide insight into the nature of citizen disengagement from government.

Collaborate:

Go beyond surveys and public hearings to encourage participation of citizens, preferably on their terms. Construct academic-practitioner-citizen collaborative efforts to overcome the partitioning of kinds of knowledge.

Strategize:

Actually use citizen assessment feedback to determine the extent to which you are out of touch with the citizen-driven goals.

Organize:

Make space for organized citizen groups to be heard, and rectify language or procedures that is exclusionary (Zanetti 1998, 114).

Zanetti's hopeful message is that we may take "advantage of public administration's position at the nexus of government and citizen to produce a more integrated, connected, and substantively democratic practice of public administration" (Zanetti 1998, 119).

The Minnesota-based Citizens League, a research group funded by the Alfred P. Sloan Foundation, has looked at several cases of citizen participation in local governments across the country, each employing varying degrees and types of participation. They have produced a model for effective governance that identifies three key elements—citizen engagement, performance measurement, and government policy implementation—and links them in four different ways. Benefits to the agency and community from the employment of these linkages increase as one type of linkage is added to another. The fourth, and most beneficial, linkage represents a "strategic alignment" of all three elements: citizens play an active and meaningful role in framing issues, strategic planning and budgeting, performance measurement and policy implementation (Marshall et al. 1999).

The Citizen's League identified three cities that employ Strategic Alignment: Prince William County, Virginia; the city of Portland and Multnomah County, Oregon; and the Silicon Valley region in California. All three areas report dramatic improvements in citizen

satisfaction, efficiency and effectiveness, policy clarity and focus, and community responsiveness (Marshall et al. 1999).

Public administration professor Cheryl Simrell King and sociology professor Kathryn M. Feltey collaborated in Ohio with practitioner Bridget O'Neill Susel to study citizen participation in public administration (1998). Using focus group discussions and interviews with citizen participation experts, nonelected administrators, citizen group activists, and participatory citizens, the researchers found that the current framing of participation in administrative processes excludes citizens until it is far too late for them to make any meaningful contribution. Participation is not "authentic" when citizens are asked to merely approve pre-established policies after administrative "experts" have formed the issue and solved the problem. Participation is considered to be authentic, and therefore rewarding to everyone, when "[c]itizens are central and directly related to the issue; they have an immediate and equal opportunity to influence the processes and outcomes" (King, Feltey, and Susel 1998, 321).

Partnerships between citizens and administrators must be formed early on, with administrators and citizens both learning how to genuinely cooperate in the decision-making process (Gray and Chapin 1998). Genuine cooperation and democratic decision-making will not be possible without the "listening bureaucrat" described by public administration scholar Camilla Stivers (1994) and communitarian philosopher Taylor (1995). King, Feltey and Susel quote one public administrator in Ohio:

The first step is to make it clear that you're going to be receptive to their comments. But also I think a critical second step to maintaining their trust is to demonstrate to them that they're being heard...and that their ideas are shaping whatever you're developing (King, Feltey and Susel 1998, 320).

Orion F. White (1990) reminds scholars and practitioners of public administration who may favor technical efficiency and elite authority of the larger social goal at work: the "public interest." White (1990) and Zanetti (1998) suggest that technical working methods to improve efficiency have an important place in the field, but that they also tend to privilege elite authority and distort the administrative process, making it unfriendly to the human citizens it is meant to serve. White calls, instead, for "social efficiency," which provides for the public interest by balancing technical and political factors. "The public interest, like consciousness, can only exist as people *live it out with each other*. In seeking the public interest in this way we can achieve *isonomy*, the highest form of government: *rule by all in relationship*" (White 1990, 238-9).

Does Participation Improve Citizen Attitudes About Government?

While reviewing the literature for this study, I found a great deal of convincing anecdotal and indirect evidence that citizen participation, of the right sort, does indeed improve negative citizen attitudes toward government. Numerous references and examples were

provided of scholar and administrator assumptions of improved citizen attitudes (Grisham 1999; King, Feltey and Susel 1998; King and Stivers 1998; Marshall et al. 1999; Musso 1999; Zanetti 1998). For example, in one description of a government-sponsored community group exercise in Florida, the change in citizen attitude was obvious to the researcher. Guided by facilitators in a novel approach to goal-communication, a group of citizens drew two sets of pictures: the first depicting the state of their communities at that point, the second showing what they envisioned for their communities after the implementation of the proposed community development project:

[The second set of drawings] included things like playgrounds, a community center, places to shop, and decent housing. To the residents of Bithlo and Winter Garden, these crude crayon drawings with stick figures represented their dreams. This was a very emotional and cathartic point in the process. The anger melted away as the citizen spokespersons presented their drawings at the end of the session.... The eyes of grown men welled with tears as they explained their current visions of hopelessness and despair, and their hopes and dreams for their children's future. After the visions exercise, the citizens' attitudes softened considerably (Gray and Chapin 1998, 185).

Evan Berman took a quantitative approach in his research on cynical citizens (1997). Berman conducted an elite study of public administrators' perceptions of levels of citizen trust and cynicism. Based on their experience with citizens, the respondents reported their perceptions of citizen trust in local government. Those cities with low trust ratings tended to have "ardent" levels of cynicism characterized by strong anti-government ideological beliefs, while those cities with high trust ratings tended to experience milder expressions of cynicism characterized by beliefs that are based on actual experience and may therefore be "more open to influence by reason" (Berman 1997, 106).

Berman suggested three ways to reduce public cynicism: first, by more effectively educating citizens on the ways that government currently helps or serves them; second, by incorporating "citizen input into public decision-making"; and third, by "enhancing the reputation of local government for competency and efficiency" (Berman 1997, 106). The "high trust" cities tended to be more creative in their cynicism-reduction strategies:

In addition to the standard strategies, these cities use dozens of citizen task forces and focus groups, have strategies to respond immediately to citizen queries and complaints, use surveys to identify citizen preferences (in addition to attitudes), have regular meetings with neighborhood activists, prepare bimonthly newsletters, and consistently explain

what government does and how it meets citizen needs. In some cities, over 300 citizen panels and advisory boards are used (Berman 1997, 110).

Berman emphasizes that proper management of government-citizen relations does have a positive effect on citizen attitudes, even when controlling for economic and social factors. He writes, "To restore trust, citizens must come to increase their commitment to the purpose of government. Specifically, they must believe that government serves their needs, that they can affect decision-making, and that government is able to deliver. Public administration affects these outcomes" (Berman 1997, 110-11).

Conclusion

To advance our understanding of citizen attitude change, Berman suggests that "case studies are needed of jurisdictions or agencies that have turned around negative public attitudes" (Berman 1997, 111). In addition, I would suggest that a future study survey citizens directly, rather than rely on elite's perceptions of citizen attitudes.

My goal is to determine whether or not active, "authentic" participation has the effect of improving citizen attitudes about government. There are many ways that such a study could be designed. One method would be to contact an existing, known group of citizens who have actually engaged in "authentic" citizen participation programs (as defined by King, Feltey and Susel 1998) or in "strategic alignment" programs (as defined by Marshall et al. 1999) and question them about their pre- and post-participation attitudes toward government.

For example, I could select one or more of the cities identified by the Citizens League as employing the optimal, "strategic alignment" level of citizen participation in governance and then interview those citizens who actually participate(d) in the public administration processes there. It would be important to ask questions that gave information about the citizens' pre-participation attitudes toward their local government, the history of the citizens' participation or nonparticipation, the actual type of participation engaged in by those citizens, and whether or not their attitude or opinion improved as a result of their participation in the strategic alignment program. Additionally, I think it would be important to know about the history of the relationship between citizens and administrators in that city or county: has it been generally positive or negative?

One weakness of using this approach, however, is that the respondents may not be able to accurately represent their pre-participation attitudes. There may also be difficulty locating the respondents if they have moved.

Another possible method would be to find a city or agency that plans to implement a program that requires authentic citizen participation and use a longitudinal panel study, wherein the respondents would be interviewed at two or more time points, to measure participants' attitudes toward government "before and after." The survey questions would be similar to those mentioned above. Of course, there may still be the problem of finding citizens who move sometime after the initial interview.

Additional questions should be asked, with either

method, to determine what types of spillover effects may or may not have occurred as a result of the participation project. These questions would be posed to the administrators involved as well so that we can determine if it is possible to institutionalize effective participation.

Though I am unsure at this point about the precise research design that would be most effective at measuring the effect of citizen participation on attitude change, I feel confident that such a study would be of value. If it is found that authentic participation does turn negative attitudes around, and that there are positive spillover effects to the community and other agencies or governments, this study may help to convince greater numbers of administrators to employ meaningful citizen participation in their governance processes.

I would like very much to help my bureaucrat-hating colleague, and all citizens who feel disconnected from or resentful toward their governments, to overcome those feelings. How much better would our daily lives and communities be if everyone felt they had a voice in the development and implementation of the public policies that affect them? With more emphasis on our social and civic responsibilities and more inclusive attitudes toward civil society and the public sphere, democratic deliberation and decision-making may have a better chance of becoming the routine means of administering our public agencies. Imagine the quality of social justice, environmental protection, and economic development policies that could result if citizens and public administrators were to approach each other in a spirit of collaboration rather than confrontation or avoidance.

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**The Psychology of Economics: the IMF and the World Bank and the effects of their policies on developing countries:
The Effects of Structural Adjustment Programs on Selected Developing Countries.**

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Abstract:

This research paper explores the intricacies of the IMF and World Bank policies and their impact on third world and second world countries. The most powerful tool of these organizations, Structural Adjustment Programs (SAPS) is dissected and analyzed as it applies to several cases contained within this paper. The first 13 pages of this paper address the nature of SAPS and its impact on several case studies and to a lesser extent on Lesser Developed Countries as a group. Therefore, I rely exclusively on a collection of essays edited by Kevin Banaher (1994) and published in a book titled 50 Years is Enough: The Case Against The World Bank And The IMF. From time to time, I will refer to the authors of these essays when attention is given to information found in their research. Please be aware that the aforementioned source did not provide dates for when these essays were originally published.

DISCLAIMER

Fore-shadowed by the new millennium, we are left to wonder if the world order as we know it will survive the onslaught of new ideas of this new age. In the face of increasing globalization, the stability of the global economy will come under rapid fire as we seek to break down barriers and re-establish new political, socio and economic guidelines. The twin brothers of reform, the International Monetary Fund (IMF) and the International for Reconstruction and Development (the World Bank) have, from their inception, influenced the world economy in ways that have had major consequences for the actors involved in the day to day scenarios of international political economy. Given their checkered past, will these organizations be necessary in the 21st century? How much have these institutions helped or inhibited the growth of global economies? Is it too late to reverse the process?

What started as a humanitarian effort to alleviate the trauma and suffering in post war Europe, escalated into a gross exaggeration of the true purposes of these institutions. The World Bank is perceived as one of the most ill timed institutions of the 20th century. Its role as an aide agency after the second world could never and was never fulfilled, as its policies did not allow for services to be extended to European nations. An already shattered European economy did not need interest bearing loans.

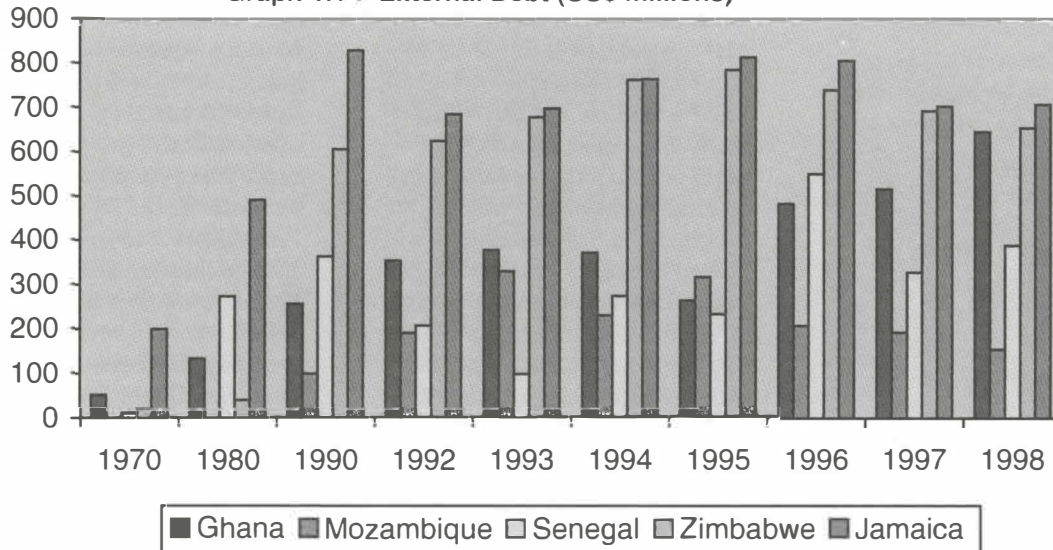
What it required was concessional grants to rebuild its already recessive economy and food imports to meet the basic needs of its starving population. Thus the World Bank was not the champion of reconstruction as its founders had hoped. It was the Marshall Plan that proved to be the savior of European industry after the second world -war. In an effort to assert itself, the Bank, in 1947 began its disastrous policy of lending to military regimes. On August 7th of that year, the Bank had approved a \$195 million reconstruction loan to the Netherlands, who only 17 days prior to the Bank's approval, had waged war on the newly independent Dutch Republic of Indonesia. The Bank further asserted itself in 1966, when it defied resolutions from the United Nations and other affiliated agencies and continued to lend to Portugal and South Africa. Portugal's colonialization of Mozambique and South Africa's apartheid were flagrant violations of the UN charter. The Bank approved a \$10 million loan to Portugal and \$20 million to South Africa. Citing Section 10, Article 4, which prohibits interference in the political affairs of any member, the Bank declared that it was legally obligated to disregard the UN resolutions (Bruce, Richard, *The World Bank/IMF: 50 years is enough*). Throughout its 66 years of existence, the Bank has made similar contributions to a variety of countries and provoked not only the mistrust of individual countries but of the general

opulace. Over the course of its life span, the Bank has revised its policies to suit the economic policy of the time, the capitalist,

subjugated, the basic infrastructures of these countries have been torn apart by the economic hardships of having to

As opposed to relinquishing its hold on these bottleneck economies, the Bank acting upon pressure from its

Graph 1.1 : External Debt (US\$ millions)



free market system brought with it SAP's. Its primary goal was to create new markets and the potential for the international investment. However, this ill-fated design had a less than desirable effect, as it not only stagnated the economies of Lesser Developed Countries (LDC's) but crippled the international economic order giving rise to the topic of major concern going into the 21st Century, Third World Debt Crisis (see Graph 1.1. gives an overview of the amount of money going to the IMF and the World Bank from selected developing countries). The precise and intimate details associated with IMF and World Bank lending and consequences resultant of such policies have come under heavy criticism in recent years, provoking discussion in the international arena as to the impartiality of the system in dealing with lesser-developed countries. Regardless of the fact that through SAPS third world economies have been

repay enormous debt and internal strife wrought by inflation and the intrusion of advanced foreign industry on fledgling LDC's economies.

World Bank, World Development Indicators 1999/2000.

- Between 1982 and 1990 Sub-Saharan Africa debt had increased by 113%
- At the end of 1992, 1.6 billion people were without potable water
- 1.2 billion lived in abject poverty with one half of children in this area
- 2 billion + are under or un-employed
- Proper health care systems were almost non-existent, infant mortality rates had almost doubled
- The fifth richest country in the world receives 150 times more income than the poorest country in Africa, a ratio of 150:1.

members revised its policies to accommodate the rising fear of economic default. No longer would private banks risk making loans to the governments of developing countries. It became a requirement that LDC's apply to the Bank for assistance and agree to the terms stipulated before they would become eligible to receive any kind of disbursements. This became part of a vicious cycle that would continue to rotate even as new strategies were implemented to correct the imbalances of per capita GNP, the redistribution of wealth and, in some cases, the cancellation of Third World Debt.

The Antagonist of Reform: Structural Adjustment Program

- Reduce the State's Role in the Economy
- Lower import barriers and allow for an open market
- Removing restrictions on foreign investment

- Eliminating subsidies for local industries
- Reducing government expenditure on social programs
- Cut wages
- Devalue the currency
- Place more emphasis on production for export rather than for local consumption

These conditions, under the guise of Structural Reform were imposed on LDC's as third world banks were running into greater difficulties servicing the loans made to them by Northern Banks. In 1980, the United States Treasury Department and the World Bank made structural reform an essential part of granting moratoriums to lesser-developed countries. There was the general belief that these reforms would allow debtor countries to repay their loans beyond the short term. These programs inspired devaluation, which is usually accompanied by inflation and heightened prices on food imports. Removal of price controls meant price increases on domestic commodities used by the poor and increased interest rates would lead to bankruptcies and high unemployment. Dismantling of trade restrictions would throw industries into disarray, in many cases cause liquidation and further compound unemployment. Removing foreign exchange restrictions would allow for the exportation of funds overseas; carte blanche or capital flight would worsen the balance of payments. (see Graph 1.2) At first, many governments were unwilling to commit to such reforms as this meant literally surrendering their infant economies to the mercy of international corporations, industries and organizations. However, unable to gain further finance from private sources

without World Bank approval, many governments surrendered. By 1985, at least 12 of the 15 debtor countries had submitted to Structural Reform. By 1990, 187 Structural Adjustment Loans has been administered. In 1988, through the establishment of the Structural Adjustment Facility (SAF), the IMF and the World Bank engaged in a much higher level of co-operation, surveillance and enforcement activities, especially in Sub-Saharan Africa.

Thirty out of 47 countries in that region are currently implementing SAP's. From Argentina to Ghana, the impact of structural adjustment has changed the face of each economy.

- State intervention in the economy has been drastically curtailed
- Protectionist barriers to Northern imports have been eliminated almost over night
- Restrictions on Foreign investments have been lifted
- Through export first policies, domestic economies have become more tightly integrated into the capitalist world market, dominated by the North

Whether the intention was to create a free market economy in the south, or aid the south in becoming more advanced so as to be able to better compete with its northern counter parts; there can be no dispute that SAP's have had a less than desirable effect on Third World Economies.

GHANA

In 1983, the Ghanaian economy was on the verge of virtual collapse. Cocoa prices worldwide had fallen. Decreasing government expenditure had given way to spiraling inflation and political instability. Accrued interest in debt from 1974 saw an increase up to \$1.5 billion. In essence the government was faced

with bankruptcy. At the behest of the IMF, the government undertook an Economic Recovery Program (ERP). As a reward for implementing IMF ventures, Ghana was showered with aid. Total economic aid from the IMF for this program totaled \$1.35 billion and total aid from bilateral and multi-lateral agreements equaled \$8 billion. By 1988, it had become the third largest recipient of aid. By the end of 1990, Ghana had contracted \$1.75 billion in bank loans and credits. However, the effects of aid were not felt over the entire economy. Between 1983 and 1990, real GDP growth was 3.88%, yet population was a meager 3.1% however; growth only affected those areas that received aid. Whilst some sectors of the economy reaped the benefits of a newly industrializing nation, other more traditional ways of living were sacrificed to accommodate changing markets. The mineral and forestry sectors had grown, whilst the manufacturing sectors had declined dramatically. Domestic and other-sub sectors have on balance been negative. The growth of the service sector to about 42% of GDP showed that the economy was quickly becoming capitalist. By 1990, real growth of GDP had fallen to about 2.7%. Inflation had dropped from 123% in 1983, to 25.2% in 1989, but climbed to 37.7%, in 1990. The ration of investment, however, was lower than it was in the 1960's and 1970's. Contractionary methods implemented by government to control inflation had decreased domestic investment and increased reliance on foreign borrowing. The supply of cocoa, Ghana's major export earner, annually was about 6 or 7%; however, world consumption was only about 2%. About 46% of

government spending was concentrated in this industry. ERP has caused serious income disparities among the population.

The wealthiest seven percent in the industry owned over half the land cultivated for cocoa, whilst 70% owned less than six acres. Exchange rates and trade liberalization methods resulted in dumping of cheap manufactured goods on the Ghanaian market, resulting in glut of produce.

Ghanaian cash crops could not compete with the cheap imports. Ghanaians obtained about 60% of their protein from fish, through a series of currency devaluations, production costs were raised, resulting in a price hike for consumers. High inflation resulted in decreased consumption, giving way to high rates of malnutrition. Morbidity rates rose as result of the introduction of user fees for health and educational facilities; illiteracy and drop out rates have also risen. In 1990, a minimum daily wage of 213 cedis was announced. The Trade Union Congress calculated that average family needed about 2000 in order to survive. Thousands of Government jobs are being eliminated. For every principle wage earner in Ghana, there are about 15 dependants.

Widespread deforestation resulted from the need to generate foreign exchange. From 1981 - 1985, the annual rate of deforestation was about 1.3%; today forests are about 25% of its original size. (Hammond, Ross and Lisa McGowan. "The World Bank's Sham Showcase." P. South End Press. Ed. Kevin Danaher. 1994.)

MOZAMBIQUE

Ghana is not alone in its attempt to recover from IMF and World Bank legislature. Real wages in Mozambique had fallen

drastically; subsidies on food (basics) had been abolished or severely cut. In January 1991, the minimum industrial wage of 32, 175 meticaïs (the meticaïs is the currency of Mozambique) amounted to only US\$31. By December 1991, 40,000 meticaïs equaled US\$23 per month; by this time inflation had gathered pace. However, by late August 1992, real wages per person per month had dropped to US\$14. The Ministry of Health in this country had stated that no one could survive on these earnings. Children support their families by engaging in petty trades i.e. selling cigarettes. Theft and corruption are prevalent. In schools, scandals often occur over teachers who accept bribes to let children pass exams and attend classes. (Mozambique Information Agency, "Mozambique in the Coils of Structural Adjustment." P. South End Press. Ed. Kevin Danaher. 1994)

SENEGAL

In 1984, the Senegalese government implemented the New Agricultural Policy (NAP), a component of SAP. Its main objectives were to reduce reliance on imports and increase production of local cereals and develop rain fed farming practices. Government withdrawal from the economy left farmers unprepared to fend for themselves. The use of fertilizer by the agricultural sector averaged about 100,000 tons, by 1989 that amount had decreased to about 25,000. Subsidies on basic foods items had been eliminated, leading to a five-fold price increase. Of the 1700 collection points established for peanut commercialization identified in 1984 by 1989, only 750 remained. The anticipated privatization of agricultural land

had been minimal, and this led to major supply problems for farmers. (Ndiaye, Adoulaye. "Senegal Food for thought: Senegal's struggle with Structural Adjustment." P. South End Press. Ed. Kevin Danaher. 1994)

JAMAICA

At the end of his first tenure as Prime Minister, Michael Manley had applied to IMF for funding but later resisted the stabilization programs, a conditionality for IMF borrowing. His protests against IMF measures led to decreased aid support for Jamaica. By 1980, Jamaica had a new prime minister. Edward Seaga, a Boston born, Harvard trained businessman, came to power with the backing of Washington in one of the most violently contested elections in the history of the island. Tourism warnings against the island were dropped, and US aid to this nation jumped from \$38 million between 1978 and 1979 to \$208 million between 1981 and 1982. By 1985, aid was about \$48 for a single person in Jamaica, twenty seven times more than any nation in Sub-Saharan Africa. The United States Agency for International Development (AID) provided an average of \$120 million annually between 1981 and 1989, more than any Caribbean nation. A new IMF deal which promised \$698 million over three years was accompanied by an additional \$400 million in aid from other member countries of the World Bank and aid agencies. Between 1981 and 1982 World Bank aid to Jamaica accounted for 67% of the aid to the Caribbean. Despite its failure in meeting its IMF economic targets, the World Bank advanced five more adjustment loans to the island. The major factor in the decision to lend to the US backed Seaga government

was the fact that the United States had the largest share of the voting power in both the IMF and the World Bank. Seaga, in accordance with IMF and World Bank regulations, dropped government protection of Jamaican businesses and opened the country to more imports. This brought multi-national corporations and saw the creation of sweatshops where women with no union representation worked for as little as \$.50 per hour. In an effort to resist the legal demand for foreign exchange and funnel money to supporters and interest groups, the Seaga regime allegedly condoned the import and resale of dollars from the profits of the ganja trade, estimated to be the second highest source of revenue for the island. By the end of 1982, Jamaica's trade deficit tripled. The dollar had been devalued by 43%, reducing the purchasing power of the poor. After a brief period of growth in 1983, inflation was on the rise again by about 30.1% between 1984 and 1985. Unemployment was up 30% overall. Between the 14 - 19 age group, female rate of unemployment was 78.6% and 58.6% for the 20 - 24 age group. In 1985, due to competitiveness of the market and the resultant low prices, one of Jamaica's largest firms, Kaiser/Reynolds and Alcoa, closed its doors. Between 1986 and 1988, net outflow of capital totaled \$881 million, \$349 million to the IMF alone. By the end of Seaga's reign, Jamaica's debt had totaled \$4.4 billion. Jamaica owned \$1,800 for every citizen and was already losing \$230 per Jamaican from International Trade. Export earning fell by 2.6% between 1980 and 1986. Government expenditure fell by 33%. Hospital services have been closed, real income of doctors and other

medical personnel had declined and fee charges had been introduced; patient care had also deteriorated. Patients were often asked to bring their own linens to the hospital. Between January 1981 and June 1985, consumer price index for housing increased by 95% in the capital and 115% in rural area. Minimum wage earned by two adults in one household was less than 40% of a basket of essential foods. October 1984 to 1985 saw a reduction of about 1/5 of the entire workforce. After Seaga's unpopular policies, Michael Manley was re-elected to office in 1989. The new government spent three months in negotiations with the IMF for a new standby agreement to replace the \$106 million deal accepted by Seaga in September 1988. That agreement had called for a limit on wage increase by 10%, interest rate hikes, credit construction and government spending. The new agreement was negotiated for \$65 million on IMF special drawing rights (SDR's); however, Jamaica was only allowed to withdraw a quarter of that amount. On October 1989, the Jamaican government suspended new talks with the IMF, and without this agreement, obtaining loans from the Bank and other sources would be difficult. Government lowered food subsidies supposedly to protect the poor. New price ceilings raised the legal maximum prices for basic necessities by 13%. Government announced it would stop buying and reselling cod (essential to Jamaican diet). Minimum wage for a single person was estimated at J\$100 which equals to US\$4, in today's terms. A family of four after buying the basics was left with US\$32.50 for rent, transport and other utilities. Food prices in Jamaica are slightly lower than the US; however, US minimum

wage is 11.5 times higher. During fiscal 1988 to 1989, Jamaica paid a net amount of \$213 million to the IMF and \$75 million to the World Bank. Net outflow to creditors reduced the 4 billion debt to \$3.95 billion. (McAfee, Kathy. "Jamaica: the show piece that didn't stand up." p. South End Press, ed. Kevin Danaher. 1994)

Effects of Structural Adjustment Programs:

- In the 1980's, Average GNP for Sub-Saharan Africa fell by 2.2% per year. By 1990, per capita income was back to levels reached in 1960
- A United Nations Advisory Report stated that Health care systems were collapsing from a lack of medicines; schools had no books and universities suffered from a debilitating lack of library and laboratory facilities
- The environment also suffered heavily under SAP's. Many Africans were forced to exploit many of their forestry and other natural resources to gain foreign exchange they needed to make interest payments on debts
- In 1990 Latin America's per capita income was at the same level it was in 1980. Severe malnutrition ravaged the countryside due to a reduction in the purchasing power of the dollar. A lack of health care systems resulted in a cholera epidemic
- Chile's real wages had declined by 40% since the 1970's
- 50% of the Mexican population is now under or unemployed; real PPP of

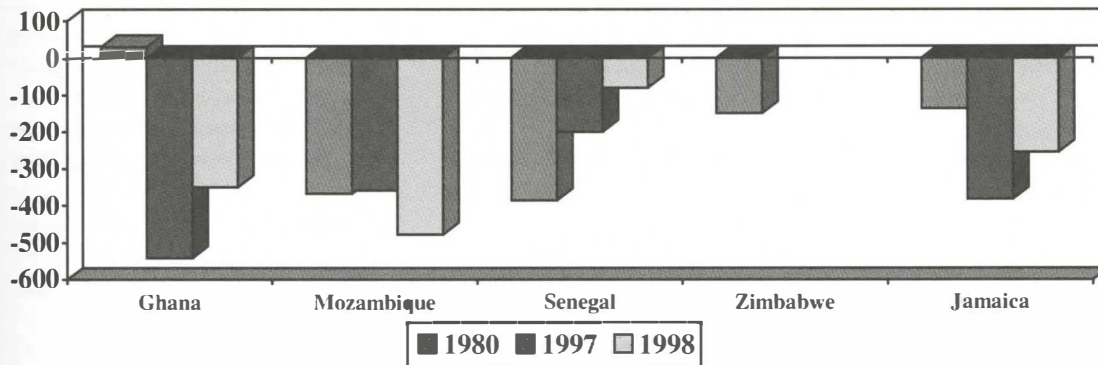
minimum wage is 2/3 of what it was in 1970

SAP's as a rule are designed to reduce domestic consumption in developing countries and re-direct resources to the

Between 1981-1990, worker share of national income fell from 49% to 29%. In Chile the richest 10% captured 47% of the national income as compared to 36% in 1970. (The Bank and the IMF consider these countries success

criticism, as many people are questioning the methodologies behind it. Many have charged that aid is said to have held up repressive regimes, worsens inequality and destroys the environment. There was and still

Graph 1.2: Current Account (US\$ millions)



World Bank, World Development Indicators 1999/2000

manufacturing sector for repayment of their external debt. This has led to the over production of primary products and a precipitous fall in their prices. Widespread devastation of traditional agricultural sectors has led to the emergence of a rural population of landless farmers in almost every country that SAP's operate in. Food security has declined dramatically and there is a growing dependence on food imports. This places many countries in a difficult position, especially Africa, as most nations do not have the foreign capital needed to pay for these imports, due to falling export prices and the need to pay their debt. A United Nations Economic Council Report on Africa stated that health had declined by 50% and education by 25%. Tax systems were made more repressive, and real wages were allowed to drop sharply. In the 1980's, Mexico's real wage fell by over 75%; today a family of four on minimum wage can buy only 25% of its basic needs.

stories). Every month debtor countries remitted a total of \$6.5 billion in interest payments, \$12.5 billion if you include the principle. This is as much as the third world spends in health and education per month. Between 1982 and 1990, debtor countries paid out a grand total of \$1.3 trillion. LDC's as a group, began the 1990's with 61% more debt.

Foreign Aid: Different types of Aid, its changing faces and its impact on developing countries.

It is easy to understand the effects of aid and be appalled at the impact of such on human life and the general economies of recipient nations. This second part of this research seeks to shed some light on foreign aid and, even though SAPS are not a part of this aid, nevertheless, the World Bank and the IMF remain the regulatory agencies for the approval of aid to any country. The conditions of aid are closely correlated with the perquisites for Structural Adjustment Programs. Aid also has come under recent

also widespread speculations about the misuse of aid; theft and misuse of funds are said to have caused the political upheavals that forced Ferdinand Marcos from power Likewise for creditor countries, aid has become a source of serious disappointment as many have realized that many southern nations lack the socio-political and economic capabilities, i.e. proper skilled, educated populations, stable governments and experienced enterprise to sustain growth. (Lairson, Thomas D. and David Skidmore. International Political Economy: the Struggle for Power and Wealth. 2nd Ed. New York: Harcourt Brace College Publishers. 1997.)

Approaches to aid:

1. In the 1950's and 60's, the first basic approach to aid was taken. Known as the "top down model," this program sought to stimulate third world development through infrastructure

and technical advice. Aid was disbursed primarily to state run projects. There was the general consensus that if such infrastructural hindrance could be overcome, third world modernization could proceed. This strategy also sought to attract foreign investment through cheap labor, abundant raw materials and a growing market third world consumer market. The population was basically seen as a huge labor force to be utilized over a period of time to assist with the process of modernization.

2. The "Bottom Up Stage", a strategy designed to improve the income gap between the rich and the poor, would take two phases. Phase one would be to improve the general overall health of the poor, i.e. improve the basic health, education and social environment of the under-privileged. Phase two would be to utilize aid to create better opportunities for the poor. Some critics argued that some programs promoted welfare dependence.
3. In the 1980's, the shift was toward market mechanisms. Aid sought to create open market economies and resulting in the implementation of Structural Adjustment Programs. The World Bank shifted its policies from loans geared towards specific projects to providing balance of payments support.

However to qualify for these loans, countries had to agree to measures that would lessen their control in their own economies.

4. In the 1990's, aid moved toward being used to sustain development.
5. The 1990's also saw the final transition to aid being used to improve the democratic process in third world countries.

Overall, it is said that aid has helped to reduce the illiteracy rate, eliminate smallpox, immunize children against diseases, spread family planning practices and increase grain yields. While some have reaped the benefits of aid, other nations still live in abject poverty, which is estimated by the World Bank to be less than US\$370 per capita. One report stated that one of the major shortcomings to aid was that it was not spread throughout the entire population. The political and economic considerations of those recipient countries have influenced the allocation of foreign assistance. In 1988, 41% of aid was distributed to middle and high-income countries. The richest 40% of all people living in the third world receive twice as much aid as the poorest 40%. A misallocation of resources is also evident. In education, a disproportionate amount is spent on higher education as opposed to primary schooling. In the 1980's, in Sub-Saharan Africa, and ODA (Official Development Assistance Report) on primary school education stated that primary school education equaled \$1 per student, whilst higher education equaled \$575 per student. Rural clinics received less aid than urban hospitals that catered to the middle class. Another study

showed that whilst aid to the US and other high-income countries amounted to US\$250 per person, assistance to very poor countries was only \$1 per person. It is apparent from the research shown that there have been some serious economic disparities in recipient.

Some studies go as far to suggest that aid is only disbursed to nations that will reflect the interests of the donor country. Other forms of aid, i.e. tied aid, are only disbursed to nations upon agreement that they purchase all their basic necessities from the donor nation. They are not allowed to "shop around" for what would best suit meet economic needs.

Impediments to Aid:

Natural disasters, e.g. famine, however, famine is not only the result of natural factors. Government policies that fail to encourage food production, failure to set aside adequate food reserves during good years and slowness on the part of the governments and outside donors to react to impending shortages, e.g. the Sudanese government, in 1990, refuted statements from International Relief Organizations and outsiders that famine was imminent. Government refusal to accept outside aid cut off relief to those who need it. Relief workers already in the country were forced to leave when troops. When crushing and ethnic revolt, accused them of assisting the rebels. Similar incidences occurred in Ethiopia in 1984 and 1985. Between 1992 and 1993, the collapse of the Somalian government and the intense ethnic warfare between the Hutus and the Tutsis, interfered with relief efforts of International Organizations to feed a starving population. (Lairson, Thomas D. and David Skidmore.

International Political Economy: the Struggle for Power and Wealth. 2nd Ed. New York: Harcourt Brace College Publishers. 1997)

Conclusion: (work in progress)

It is obvious to see that Structural Adjustment Programs (SAPS) will not be practical for the 21st century. The infrastructural damage done to these nations is vast, and it usually takes years before the process can be reversed or rectified. Henceforth, I am poised to begin the second stage of my research, which involves examining these economics in-depth and devising a workable solution as to how best to combat the effects of SAPS.

Index

On the following pages you will find tables showing recent data taken from the World Bank Development Indicators 1999/2000. these tables highlight the effects of Structural Adjustment Programs on all sectors of the economy.

Health:

	Public Expenditure (% of GDP)	Access to Water (% w/ access)		Access to Sanitation (% w/ access)		Infant Mortality (per 1000 births)		Contraceptive Prevalence (% of women) 1990 - 1998	Total Fertility Rate (births per woman)		Maternal Mortality Rate (per 100,000 live births) 1990 - 97
	1990 - 1997	1982	1995	1982	1995	1980	1997		1980	1997	
	Ghana	2.9	-	65	26	32	94	66	20	6.5	4.9
Mozambique	4.6	9	24	10	23	145	135	6	6.5	5.3	1,100
Senegal	1.2	44	50	-	-	117	70	13	6.8	5.6	510
Zimbabwe	1.7	10	77	5	66	80	69	48	6.4	3.8	280
Jamaica	2.5	96	93	91	74	21	12	65	3.7	2.7	120

Table 1.1. World Bank Development Indicators 1999/2000

Quality of Life:

	Growth of Private Consumption Per Capita. Avg. Annual Rate. (%) <u>1980 - 1997</u>	Prevalence of Child Malnutrition (% under age 5) <u>1992 -1997</u>	Under 5 Mortality Rate (Per 1000)		Life Expectancy at Birth <u>1997 (yrs)</u>		Adult Illiteracy Rate (% 15+) <u>1997</u>		Urban Population (% of total)		Access to Sanitation in Urban Areas (% with access)
			<u>1980</u>	<u>1997</u>	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>	<u>1980</u>	<u>1998</u>	<u>1995</u>
Ghana	0.1	27	157	102	58	62	23	43	31	37	75
Mozambique	-	26	223	201	44	47	43	75	13	38	65
Senegal	-0.7	22	190	110	51	54	55	75	36	46	68
Zimbabwe	-0.3	16	108	108	51	54	6	12	22	34	-
Jamaica	2.2	10	39	14	72	77	19	10	47	55	19

Table 1.2. World Bank Development Indicators 1999/2000

Structure of Demand: World Bank Statistics 1998

	<i>Private Consumption</i>		<i>General Government Consumption</i>		<i>Gross Domestic Investment</i>		<i>Gross Domestic Savings</i>		<i>Exports of Goods and Services</i>		<i>Previous Balance</i>	
	<u>1980</u>	<u>1998</u>	<u>1980</u>	<u>1998</u>	<u>1980</u>	<u>1998</u>	<u>1980</u>	<u>1998</u>	<u>1980</u>	<u>1998</u>	<u>1980</u>	<u>1998</u>
Ghana	84	77	11	10	6	23	5	13	8	27	-1	-10
Mozambique	98	90	12	9	6	21	-11	1	11	12	-16	-20
Senegal	85	75	20	10	12	20	-5	15	27	32	-17	-5
Zimbabwe	68	63	19	17	17	21	14	20	23	45	-3	-2
Jamaica	64	54	20	21	16	34	16	24	24	51	0	-9

Table 1.3. World Bank Development Indicators 1999/2000

Structure of Output

(Value added as a % of GDP)

	GDP (Millions)		Agriculture		Industry		Manufacturing		Services	
	1980	1998	1980	1998	1980	1998	1980	1998	1980	1998
Ghana	4,445	7,501	58	37	12	25	8	8	30	38
Mozambique	3,256	3,959	48	34	30	18	-	10	22	48
Senegal	2,986	4,836	19	17	15	23	11	15	66	59
Zimbabwe	6,679	5,908	16	18	29	24	22	17	55	58
Jamaica	2,652	6,607	8	7	38	35	17	16	54	55

Table 1.4. World Bank Development Indicators 1999/2000

Balance of Payments, Current Accounts and International Reserves

(\$ millions)

World Bank Statistics 1998

	Goods and Services				Net Income		Net Current Transfers		Current Account Balance		Gross International Reserves	
	Exports		Imports		1980	1997	1980	1997	1980	1997	1980	1997
	1980	1997	1980	1997								
Ghana	1,210	1,655	1,178	2,640	-83	-131	81	576	30	-541	330	457
Mozambique	339	500	844	1,005	22	-113	56	283	-367	-359	-	608
Senegal	807	1,281	1,215	1,557	-98	-62	120	166	-386	-200	25	431
Zimbabwe	1,610	3,059	1,730	3,692	-61	-405	31	-	-149	-	419	310
Jamaica	1,363	3,192	1,408	4,005	-212	-193	121	624	-136	-382	105	682

Table 1.5. World Bank Development Indicators 1999/2000

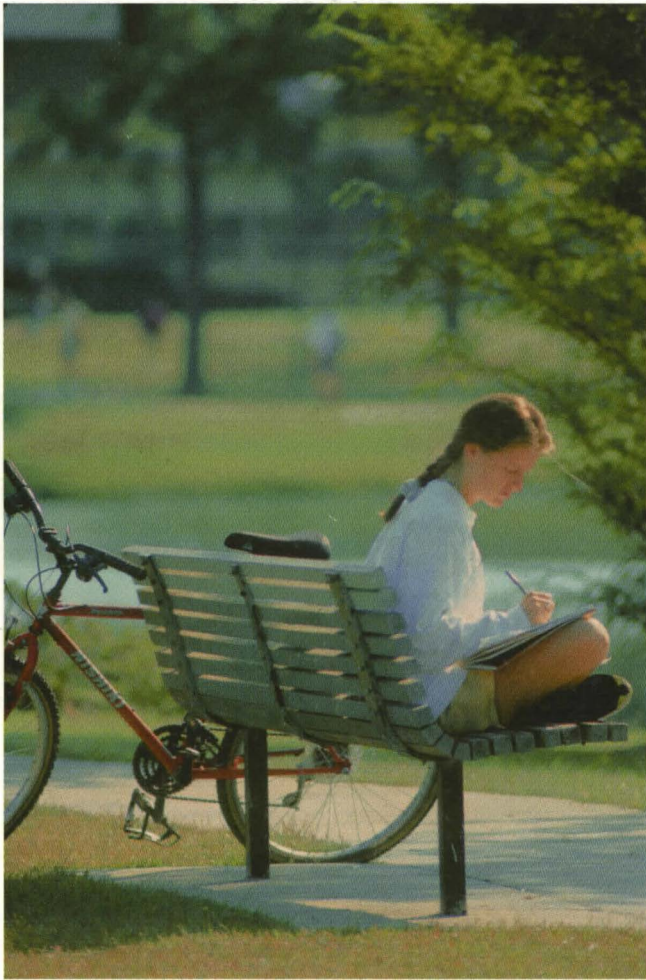
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