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WESTERN KENTUCKY UNIVERSITY

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**WESTERN KENTUCKY UNIVERSITY
STUDENT HONORS RESEARCH BULLETIN
1981-82**



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The Western Kentucky University *Student Honors Research Bulletin* is dedicated to scholarly involvement and student research. These papers are representative of work done by students from throughout the university.

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PREFACE

The 1981-82 edition of the Student Honors Research Bulletin reflects, once again, the wide variety of scholarly interests to be found among Western's student population. From ancient Greeks to modern computers, the arts and sciences of mankind continue to capture young minds and inspire them to make new contributions to the field of knowledge. The Bulletin is dedicated to the recognition-through-publication of our students' scholarly work, and I believe you will agree that this edition has done its job well.

My congratulations to all of the students whose work is represented here, especially to Barbara Parks, whose paper on "Energy Properties of Textiles" was chosen Best Paper. You have all, by the work you have done, made us just a bit better educated and a bit prouder of being a part of this academic community.

I hope that this edition of the Bulletin will, as intended, inspire more students to do scholarly research and writing — and more instructors to encourage students to submit their work to the Bulletin. If this happens, the University Honors Program's hopes of making Western a true community of learning will have been partially realized.

James Baker, Editor

**The Recognition of Anticipatory Grieving And
Associated Needs of the Family of a Critically
Ill Patient**

by Catherine E. Garvin

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Most patients belong to families. Much has been written on the subject of patients and their feelings about death and dying. However, the feelings of the families have been relatively ignored. This study will devote attention to and emphasize the needs of the family of a dying patient. As stated by Fulton: "Of all the social institutions, the family and kinship systems are of the greatest importance insofar as the study of grief and bereavement is concerned." (3:246)

The Problem

Statement of the Problem

The purpose of this pilot project is to identify whether or not the family of a critically ill patient, isolated in an intensive care unit, experiences anticipatory grief. Emphasis will be placed on the subjects' abilities to identify specific needs during this grieving process and associated nursing implications.

Assumptions

For purposes of this study it was assumed that:

1. The subjects would be frank and honest when describing their needs.
2. The relationship between the patient and family member was such that the death of either would be perceived as a significant loss by the survivor.
3. When an individual experiences a catastrophic illness prior to death, the significant other will experience an anticipatory grief process before the death occurs.

Research Hypothesis

Family member of critically ill patients isolated in intensive care units will experience an anticipatory grief process associated with specific identified needs.

Definition of Terms

For purposes of this study, the following terms are defined:

1. **Critically Ill**—A patient in acute change who is isolated in an intensive care unit and judged by the admitting physician as having an extremely grave prognosis.
2. **Anticipatory Grief**—an awareness of the impending death of a person, which involves a state paralleling the state associated with bereavement.
3. **Need**—requirement of a person which if supplied, relieves or diminishes his immediate distress or improves his sense of inadequacy or well-being.

Delimitations of the Study

For purposes of this study, the only delimitation was the Intensive Care Unit at Bowling-Green Warren County Hospital at Bowling Green, Kentucky.

Significance of the Study

The significance of this study involves the implications of the results to the nursing profession. As specific needs of families of critically ill, isolated patients are identified, nurses can begin to formulate plans of care with specific interventions to meet these needs. This recognition of loss and anticipatory grief on the part of the family of a dying patient and the associated needs helps nurses avoid their own feelings of helplessness when dealing with anticipatory grief. Consequently, the survivor may be able to progress through the grief process much more easily.

CHAPTER II

REVIEW OF RELATED LITERATURE

The conceptual framework of this study was based on the sound theory of loss and grief. Loss has been defined by Dracup as "the deprivation of an object, person, possession, or ideal that was considered valuable and had an investment of self. Loss is an integral part of the human experience, with the loss of a significant other being the most profound experience of this kind." (2:213) In addition, Dracup identifies the process of anticipatory grief in relation to persons experiencing extreme potential losses. (2:213) Hampe reinforces this theory by outlining the stages or components associated with the anticipatory grieving process. These include the impending death of a significant person, an awareness of that impending death; and an emotional state usually associated with bereavement. (6:114)

Shoenberg reinforces this theory by stating, "Grief frequently be-

gins before loss actually occurs. In nearly all instances in which loss is imminent, those concerned experience the beginning of grief." (11:25)

Other research studies on the subject of loved ones of critically ill patients seem to focus on the needs and problems of these family members or significant others. Hampe's research on grieving spouses showed that the spouses had specific needs. These were divided into two general categories.

First, there are needs which center on his relations with the dying person: to be with the dying person, to feel helpful to the dying person, to be assured of the comfort of the dying person, to be kept informed of the dying person's condition, and to be aware of the dying person's death. Second, are the needs of the grieving person himself: to ventilate his emotions, to receive comfort and support from family members, and to receive acceptance, support, and comfort from the health professionals. (6:113)

In a study conducted by Nelson on the impact of health care services on the survivor and the patient, he concludes that "the quality of the interpersonal content, specifically communication, contributes to a health bereavement on the part of the key person and a more meaningful death of the patient." (10:1643) He identified five resources available to patient and survivor in maintaining stability of their relationship. These are religion, family strength, services available, openness of communication, and setting of care. (10:1643)

For purposes of this study, the impact of the "setting of care" will be examined. In an extensive research study done by Sherizen, he identified the setting of the Intensive Care Unit as a major constraint on the family's ability to face the death of the patient. He summarizes the literature by saying:

...critical illness is a socially significant situation, emotional and physical trauma is possible for relatives, serious changes in familial interaction patterns have the potential for causing a crisis, and special forms of hospitalization, such as the Intensive Care Unit, heighten each and every one of these conditions. (12:31)

Sherizen also identified the physical arrangement of the Intensive Care Unit as an important influencing factor. Family members expressed their acceptance of the structure of the ICU as necessary for maximal care, but most felt uneasy while in the unit and manifested

this uneasiness in terms of avoidance of the unit or minimal visitation. (12:33)

The review of the literature also points out the role of the nurse in intervening to meet these needs and assist the family or significant other in healthy grieving. Nurses should have an understanding of the effect that anticipatory grief has upon the family. (6:119) Hampe states, "Nurses must recognize that when a patient is dying, the family members are also her patients." (6:119)

Verwoerdt states, "It is necessary to encourage expression of emotion in grieving relatives, because conscious recognition of the anticipatory loss and the concomitant feeling of grief is the first step toward resolution of the mourning experience." (13:116) As Gardner and Stewart state:

Appropriate staff interaction with the family may lead to decreased anxiety, increased reassurance, better cooperation, improved rapport, mutual understanding and empathy, and improved patient care. (4:105)

With regard to the spouse of the dying person, Kubler-Ross maintains "if widowed persons had been helped before the death of their partner to bridge the gulf between themselves and the dying one, half of their battle to work through guilt and grief might have been won". (7:143)

The literature reviewed contains many different suggestions for staff involvement with the family. Effective staff intervention in the grieving process begins with preparation of the nurses - including an understanding of the anticipatory grief process and the theory of loss. (8:124) Hampe emphasizes the need for this preparation by stating, "...for health professionals motivated to enter the healing professions by a desire to help people and relieve suffering, a dying patient frustrates and threatens their aims of health care. This frustration leads to avoidance of patients and their family members." (6:117) By identifying the specific needs of the family members, nurses will have a target on which to base their interventions.

In a study conducted in a Cardiac Care Unit measuring the effect of family preparation, (by way of brochures, staff interactions, etc.) on the anxiety level of the patient, it was concluded that family preparation significantly reduced the amount of anxiety transferred from family member to CCU patient. (1:316)

Glaser-Strauss emphasize "A tactful staff allows kinsman plenty of time with the dying person...separation would be more painful than 'participation' in the dying". (5:154)

The nurse should explain to the family why certain procedures are being done and what benefit they are to the patient. (9:44) Relatives may feel painfully helpless and powerless about their inability to influence their loved one's recovery.

Gardner identified specific nursing interventions for the nurse in helping the family to cope.

1. Contact the family in person or by phone as soon as the patient is admitted.
2. Give the family the unit phone number and visiting hours. Suggest when family members call, they speak to the nurse caring for the patient.
3. Explain physical environment and policies of the unit aided by a brochure.
4. Accompany the relatives to the bedside and demonstrate how to speak to and touch the patient.
5. Act as facilitators and arrange family-physician meetings.
6. Designate times to give the family progress reports, and attempt to resolve any problems at that time. (4:110)

These are only a few suggestions for nursing interventions. Many implications pertain to specific crisis situations; however, the principle remains the same. Nurses must accept the family as an extension of the patient and come to grips with their own emotions concerning death and dying while delivering holistic care to the patient and his "environment".

CHAPTER III METHODOLOGY

The methodology was approached non-experimentally using a semi-structured, unstandardized interview with open-end questions (See appendix). The sample was selected by convenience at Bowling Green-Warren County Hospital in Bowling Green, Kentucky. Permission for research in the Intensive Care Unit was granted by the ICU supervisor. A sign was posted at the nurses station asking the nurses to call the interviewer whenever a patient was hospitalized in ICU with an extremely grave prognosis and accompanied by at least one family member. The interviews were conducted by the author. The nurses contacted the interviewer on three separate occasions. Each time the interviewer came to the hospital and approached the family member directly outside the ICU during or right after visiting time. The interviewer wore a lab coat and name pin. She introduced herself and explained the nature and purpose of the research and gave assurance that subjects would remain anonymous. All three subjects agreed to participate in the study. At this time the subjects were taken to the

prayer room in the hospital where a consent form was signed. Interviews were recorded on a tape recorder in full view of the subjects. The semistructured interview tool included open-end questions regarding the eight needs as identified by Hampe (6:115), the most important need to the subject, and the identification of anticipatory grieving. Each interview lasted approximately one hour. The interviewing tool used is a modified version of a tool formulated by Sue Bryant, RN MSN, Assistant Professor of Nursing at Western Kentucky University and validated by Mary Hazzard, RN, MSN, PHD, Professor of Nursing at Western Kentucky University. Validity can also be inferred by the fact that 100% of the subjects identified all eight needs as well as anticipatory grief.

Demographic data including sex, age, race, and relation to patient were obtained from the subjects prior to the interview. Demographic data were also taken from the patient's chart concerning the age, sex, diagnosis, and length of stay of the patient in ICU prior to the time of the interview.

Table I
Demographic Data - Family Member

Subject	race	age	sex	relation to patient
A	White	29 years	female	mother
B	White	42 years	female	daughter
C	White	24 years	female	wife

Table II
Demographic Data - Patient

Patient	age	sex	length of stay in ICU prior to interview	Diagnosis
A	10 months	male	2 days	seizure disorder
B	66 days	male	2 days	cancer of lung-resp. failure
C	24 years	male	1 day	closed head injury

Table III
Responses for Subjects to Interview

Need	subject A	subject B	subject C
1. to be with dying person	yes	yes	yes
2. to be helpful to the dying person	yes	yes	yes
3. for assurance of comfort of dying person	yes	yes	yes
4. to be informed of dying persons condition	yes	yes	yes
5. to be informed of impending death	yes	yes	yes
6. to ventilate emotions	yes	yes	yes
7. for comfort and support of family members	yes	yes	yes
8. for acceptance comfort and support from staff	yes	yes	yes
9. recognized and identified anticipatory grief	yes	yes	yes

CHAPTER IV ANALYSIS AND INTERPRETATION OF DATA

The data were analyzed as to which categories of need were recognized by the subject including the recognition of anticipatory grief and the most important need as evaluated by the subject. Often the needs were identified by the subject without any questioning on the part of the interviewer. All of the subjects appeared very open and verbal. The interviewer felt that she had some therapeutic value in that the need for ventilation is well documented. (6:114) The subjects expressed gratitude for having the opportunity to share their thoughts

and feelings with an objective, empathetic person.

Results

In response to question number 1, all three subjects responded in the affirmative to the need to be with the dying person. As one subject stated, "The fact that he is isolated in that room (ICU), dying, and I am unable to be with him is frankly devastating. I only wish I could just be with him more."

In response to question number 2, again all three subjects recognized the need to be helpful to the dying person. They expressed their fear of the equipment, various tubes and lines attached to the patient. Therefore, they wished only to wipe the patient's brow or apply lotion to his face and hands. All three were unsure of what else they could do without disturbing the equipment.

In response to question number 3, all three respondents expressed the need to be assured of the dying patient's comfort. As one subject said of her infant son, "I just want to hold him and comfort him so he will not be scared. I just have visions of him in there (ICU) crying, upset, and in pain." All subjects stated that they were satisfied with the physical care their loved ones were receiving.

In response to question number 4, all three respondents expressed the need to be informed of the patient's condition. All three subjects expected nurses and the physician to give them information. They felt as if they were being kept informed and they understood the information, but they had to knock on the door of the ICU and ask for it. This seemed to intimidate them. Therefore, they suggested that the nurses give them reports on a regular schedule. For example, every hour or so the nurse or liaison person could call to the waiting room and speak to them over the phone or in person.

In response to question number 5, all three subjects reacted strongly to this question. They stated that in the event that the condition of the patient worsens and death is impending, the family member wanted to be informed either by the nurse or the doctor.

In response to question number 6, all three subjects expressed the need to ventilate their emotions. At the conclusion of the interviews, the three family members informed the interviewer that they felt "better" after having talked about their problem.

In response to question number 7, again all three subjects expressed the need for comfort and support of family members. They stated that they could not face this situation without the love and support of their family members. One subject stated, "My husband offers me a great amount of needed support. I couldn't make it without him."

In response to question number 8, again all three subjects answered

in the affirmative to the need for acceptance, support and comfort from the staff. Two of the respondents stated that the staff were kind and helpful. The third respondent stated that the staff offered her a great amount of support. She stated, "Sometimes all you need is a kind face, and this is especially important when it concerns the nurses who are caring for your family. At a time like this, I just couldn't face a cold, hateful staff; and thank goodness, I don't have to."

In response to question number 9, all three subjects recognized their anticipatory grieving. They expressed they were preparing for the patient's death including their present grief. As one subject stated, "The doctor told us there is not much hope, and I already feel myself grieving as if he was already dead."

In response to the last question, all three respondents identified the need to be with the dying person as the most important need they had. They all expressed the dislike of the isolation of their family member in the Intensive Care Unit although they realized that this was necessary for maximum care.

In relation to the hypothesis, "Family members of critically ill patients will experience an anticipatory grief process associated with specific identified needs", the collected data support and reinforce the the hypotheses. All three of the respondents identified their anticipatory grief and identified all eight needs as outlined by Hampe (6:115).

Limitation

1. This study was limited greatly by sample size and convenience sampling.
2. The study was limited to a one time interviewing session conducted immediately after the confirmation of a grave prognosis.
3. The study was limited to intensive care patients only.
4. Interviewer bias may have been another limitation. Because the interviewer was a nurse interested and concerned about families of critically ill patients, her personal concern may have affected the finds.
5. The interviewing tool did not accurately emphasize or measure the degree of anticipatory grief and whether or not the identified needs were actually met.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

SUMMARY

This study attempted to identify whether or not family members of critically ill patients experienced an anticipatory grief process. The attempt was also made to identify certain specific needs associated

with this grief as outlined by the family members of three critically ill patients hospitalized in an Intensive Care Unit. They were interviewed using open-end questions relating to anticipatory grief and the eight needs of the grieving person as outlined by Hampe (6:115). A content analysis was done following the data collection. All three of the subjects identified all eight needs as well as identification and recognition of their anticipatory grief.

Recommendations

This study needs to be repeated in full scale, including a larger, more heterogeneous subject sample possibly in different locales. Further research may include measurement of the degree of anticipatory grief in relation to time and in comparison to the bereavement process. Follow-up interviews could be made after the initial interview.

The implications for nursing practice are obvious. Future studies could include whether or not the identified needs are met. Consequently, nurses could devise specific interventions to facilitate meeting these needs of the grieving family. In this way, nursing research can be translated into clinical practice.

CONSENT FORM

I hereby consent to participate in the study regarding the needs of the family of a critically ill patient. I have received a full explanation of the study. I understand that my name will not be used and that I may withdraw from the study at any time.

Signed: _____

Witness: _____

Date: _____

INTERVIEW

1. Tell me how you have been spending your time since your _____ has been in the hospital. Have you been able to be with him/her as much as you would like?
2. Tell me what you have been able to do for your _____. Do you feel like you have done enough or would you like to do more?

3. Tell me about the care your _____ is receiving. Are you satisfied with it? What more could be done for your _____.
4. How have you learned about your _____ conditions since he/she has been in the hospital? Do you receive enough information? Do you understand the information? From whom do you usually receive the information?
5. In the event that your _____ condition worsens to the point of death, do you want to know about this? Who would you like to inform you of this?
6. How do you handle your feelings about your _____ condition? Is there anyone in particular who helps you?
7. Do you feel like your family members help you at a time like this? If you have no family members, are there others who help you?
8. Tell me about the staff that is caring for your _____. Do they accept, support, and comfort you? Are there other things they could do to support you?
9. Are you anticipating your _____ death? Do you feel as if you have already begun to grieve?
10. Of all the needs you have identified, which do you feel is the most important?

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ENERGY PROPERTIES OF TEXTILES

by Barbara Parks

INTRODUCTION

The validity of the energy crisis has been recognized by most people. There simply are not enough fossil fuels to supply our needs indefinitely. The few remaining people who may not yet be convinced of our energy shortage are definitely aware of the economic need to conserve energy as the cost of utilities, gasoline, and consumer goods continues to rise with the cost of energy.

The textile industry can make a major contribution in helping people adapt to the energy crisis. Improvements in energy requirements for fiber production and fabric dyeing and finishing are being made that will result in substantial industrial savings. Advancements are being made in both the production of fabrics and the understanding of thermal comfort to help people live healthy, comfortable, productive lives with less heating and cooling of their environments.

ENERGY UTILIZED BY TEXTILES

Textile Industry

The textile industry ranks seventh in industrial use of energy in the United States. In 1976, 3.1% of the total industrial energy used in the United States was used by textile mills and manufacturing industries excluding fiber production (Polyzou 1979). The government has requested a 27% reduction of energy used by the industry from 1972 to 1980 (Crippen, unpublished, "Energy Efficient Textile Products"). Preliminary results of a study by the Textile Economics Bureau indicate the man-made fiber industry has reduced the amount of energy required to produce a pound of fiber by 36% since efforts to reduce the energy required for production began in 1971 (1978 "Focus on Man-Made Fibers"). Efforts are being made to reduce the amount of energy needed in dyeing and finishing processes. These efforts include new technology in solar heating, the reduction of solutions needed for dyeing and finishing and a reduction of drying time during heat settings. Hibrank and Brown (1974) report mechanical means of water removal such as squeezing, vacuuming, and rolling have been more

efficient at removing water down to the 30-40% saturation level than heat drying. Counterflowing the heat used in fabric setting processes back to fabric drying areas allows the same heat to perform two functions. The use of air jets to quickly remove evaporated air has also reduced the energy needed for drying in fabric processing. It is clear that the textile industry is becoming more energy efficient.

Textile Products

The energy used by the textile industry is only a portion of the total energy needed through the life cycle of a textile product. It is important to include all energy required for fiber production, fabric production and finishing, product manufacturing, maintenance, and life expectancy in total energy comparisons. Hidden costs such as the energy needed for fertilizers, machinery, and food required to grow natural products should be included along with costs for waste. Fabrics should be compared in yards rather than pounds as it takes the same number of yards to make a shirt or dress whether it is cotton or polyester, but a different amount of pounds.

A 1976 study at Yale University (Van Winkle) compared cotton shirts to 65% polyester-35% cotton shirts. Results showed the all cotton shirt required 88% more total energy through all stages of the life of the garment (1978 "Focus on Man-Made Fibers"). The blended shirt required 25% more energy to produce, but the cotton shirt required twice as much energy to maintain and lasted only two-third as long (Polyzou 1979).

The results of a cotton-polyester comparison provided useful information for the consumer who should be aware of total costs, but it is doubtful that a return to all natural fibers would be feasible even if the cotton shirt had required less total energy. Synthetics account for 75% of the fibers used in the United States today. The amount of additional land needed to change from synthetics to cotton is estimated to be at least the size of South Carolina ("Union Carbide and National Energy Problems"). This land might be better used for food production, living space, and industry.

Despite the amount of energy needed to produce and maintain a textile product, it is still much more efficient to use these products to keep us thermally comfortable than it would be to use the same amount of energy to heat and cool our houses.

EFFECTS OF ENVIRONMENTAL TEMPERATURES ON THE BODY

The body has its own systems of heating and air conditioning. These

systems are used when the temperature of vital organs changes from 98.6°F (McClellan 1976).

In cold weather, when the internal body temperature drops below 98.6°F, the body reacts by constricting the blood vessels in an attempt to keep the blood in the trunk and head near vital organs. This vasoconstriction reduces the blood flow to the outer portions of the body and causes the nervous system to signal small muscles which react by shivering. Shivering produces heat by muscle movement and creates a roughness of the skin caused by "goose-flesh" and body hair rising. The effect of body hair would, of course, depend on the amount of body hair and would be minimum in most females. If the air beside the body is moving, this roughness could act to slow down movement and form an insulating air layer. This would normally occur if the body were unclothed. On a clothed body, the trapped air between the body and its clothing might be disturbed by shivering and act to make the body colder (Goldman 1978).

The arms and legs are the first to suffer in low temperatures because they are not vital to life. The physically fit normally have better circulatory systems and react better to temperature changes.

The head is next to suffer because it has little natural insulation in the form of skin thickness and is hard to clothe. An unclothed head can lose up to 50% of the body's heat at temperatures below 40°F (Hollofil "Keeping Warm in Cold Weather"). The head is of special concern because it contains the brain. While the body can maintain life at reduced circulation, the head can not carry out normal thought processes if the blood supply is slowed appreciably. Hikers have been found frozen to death with food and clothing in their backpacks. Researchers have concluded the hikers were unable to think well enough to eat the food for energy or put on the additional clothing because of their slowed thought processes.

In warm weather the body reacts in the opposite way by sending blood to the surface to be cooled. This vasodilation causes the nervous system to signal the body to begin sweating allowing the body to be cooled by evaporation. If evaporation is inhibited by high humidity or clothing, more blood is pumped to the surface. The additional blood can cause heat stress symptoms including flushed face, swelling of hands and feet, and fainting. The symptoms are also less likely to occur in the physically fit because sweat glands that are infrequently used require more internal demand to activate them.

METHODS OF HEAT EXCHANGE BETWEEN THE BODY AND ENVIRONMENT

Heat can be produced in the body by metabolism, exercise, and shivering. It can be exchanged between the body and environment through conduction, convection, radiation, and evaporation (Fourt and Hollies 1970).

Conduction is the exchange of heat by direct contact. Sleeping on a cold floor would allow heat to flow from the body to the floor. Conversely, sleeping under a warm, electric blanket would allow heat to flow from the blanket to the body. The molecules which make up matter are constantly moving with hotter molecules moving faster and colliding with slower, cooler molecules resulting in a heat exchange with heat moving toward cool.

Convection is heat exchange in air movement. A strong winter wind can move the warm air which surrounds the body quickly resulting in a heat loss. Weathermen refer to this as the wind-chill-factor. Convection may also result from body movement or exercise.

Radiation is heat exchange by emission which occurs without direct contact with another object or air movement. Heat is transferred from a hot object to a cooler one by electromagnetic waves. The sun and other heat sources transfer heat to the body by radiation.

Evaporation is heat loss with moisture. This is the only method to move heat from the body to the environment when the environment is hotter than the body. The body produces moisture in the form of perspiration or water vapor in the breath. Perspiration is changed to water vapor on the skin's surface where it is evaporated to cool the body. This process is not normally reversed so that warm moisture is against the body except when bathing in hot water or accidental steam burns.

MEASURING THE INSULATIVE VALUE OF CLOTHING

The Clo Unit

It is difficult to measure thermal comfort because people differ and their feelings of comfort cover a wide variety of physical and mental relationships.

There are at least as many different approaches to defining and assessing thermal comfort as there are different disciplines involved in studying the problem. Physicists measure the environmental surround and calculate heat

transfers; physiologists predict heat balances and measure skin and core temperatures and sweating or shivering; psychologists evaluate sensations by a variety of scales and take votes of comfort. Heating and air conditioning engineers began to develop indices over 50 years ago (Houghten and Yaglou, 1923) to evaluate the "effective" acceptability of indoor thermal environmental conditions. Engineers and psychologists, following these leads, have developed some quite useful scales: "thermal sensation" (KSU), "predicted mean vote" (Fanger), various scales of "comfort vote" (Rohles), etc. Recent work, recognizing the impossibilities of satisfying everyone at a single thermostat setting has led to the concept of the "predicted percent dissatisfied" (Fanger),... (Goldman "Assessment of Thermal Comfort")

The importance of thermal comfort in clothing is vital to many areas of life including the armed forces and space industry as well as individual consumers. However, the complex relationships and terminology used in expressing thermal comfort are often too technical for the average lay person to understand. Generals, who may be highly intelligent and well versed in their own technical language, may not have the time to devote to understanding the language of thermal comfort. Recognizing the need for a readily understandable term, Dr. A. P. Gagge of Pierce Foundation in New Haven, Connecticut, developed the "clo" unit in 1941 (McClellan 1976).

The clo is a unit for measuring the total thermal resistance from the skin to the outer surface of the clothed body. Technically, one clo will allow passage of one kilocalorie per square meter per hour with a 0.18°C temperature gradient (Hollofil "Thermal Insulation"). A clo may also be defined as "the clothing required to keep a resting subject in a comfortable state when the subject is seated in an atmosphere of 21°C with relative humidity less than 50% and air movement at 0.10 meters per second" (Munson 1978). When Gagge divided the clo unit, a man's suit was equal to 1 clo, summer slacks and short sleeve shirt were equal of 0.5 clo. The larger the clo number, the warmer the clothing.

The clo units of individual garments in an ensemble can be added together to give the total clo of the ensemble. It is not necessary to remeasure for every different possible combination of an ensemble. This saves a great deal of research time, but it is still difficult to keep current clo listings because of fashion changes. In less than one year a major fashion change can cause 83% of the people to wear an ensemble that varies as much as 0.2 clo from the previous year (Munson 1978).

Because of fashion changes and the wide variety of people using clo units, it is important to keep them simple to measure and understand.

It is also important to remember that clo measurements are made at indoor, sedentary conditions. Since air velocity is usually less than 0.4 meters per second indoors, it is not a major factor in clo units. Emotional sweating is also not measured by the clo unit. Recognizing the need for a system of predicting evaporating heat transfer, Dr. Alan Woodcock of the United States Army Research Institute of Environmental Medicine developed a permeability index, " i_m " which allows for estimating skin temperatures and percent sweat wetted area for any combination of clothing and activity level (Goldman "Evaluating the Physiologic Effects of Clothing on the Wearer"). This method of measuring the resistance to evaporation uses a scale ranging from zero where there is no water vapor to one "if the clothed, 100% sweat wetted man were slung by the heels at sufficient velocity so that he achieved the full evaporative potential of a ventilated wet bulb thermometer" (Goldman "Thermal Comfort Factors: Concepts and Definitions").

The "pumping coefficient" is a method of describing the effect of air and body motions on insulation and permeability of clothing (Goldman "The Role of Clothing in Modifying the Human Thermal Comfort Range"). This method is used at the United States Army Research Institute. However, Fourn and Hollies (1970) report that no satisfactory method of measuring wind resistance has been generally accepted.

The clo is the most accepted unit for measuring the insulative value of clothing. Using it with other methods for measuring the effects of sweat and air movement can result in a total picture of thermal comfort that includes all four factors of the environment: air temperature, radiant temperature, vapor pressure, and air motion (Goldman "Thermal Comfort Factors: Concepts and Definitions").

Measuring Clo with a Copper Manikin

A heated copper manikin in an environmentally controlled chamber is used to calculate clo units. The manikin was chosen because it allows for fabric overlay and design features which can be significant factors in a total ensemble. The manikin also allows for thermal equilibrium. Power can be supplied through the manikin's heated circuits equal to the energy which leaves by conduction, convection, and radiation. Research is being done at Kansas State University by Seppanen, et al., on a heated manikin (Munson "An Overview of Clothing as it Relates to the Physiology of Human Comfort"). "Sweating" manikins are also used.

Other methods of clo measurement are being investigated which

would include human responses to the thermal environment (Nishi, et al., "Field Measurement of Clothing Thermal Insulation"). These would allow for a wider range of comfort factors but would lack the laboratory precision of the heated manikin.

Use of the Clo Unit with FEA Temperature Guidelines

In 1974, the Federal Energy Administration introduced summer and winter guidelines of temperature controls in our buildings and homes. The FEA established its guidelines by reducing the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) standard temperature for optimum working conditions by 6°F in winter and raising it 6°F in summer. Guidelines were set at 68-70°F in winter and 78-80°F in summer without humidity control or reheat.

Following these guidelines can result in substantial energy savings since 20% of the total United States energy is used for heating and cooling spaces (Crippen "Savings Data"). A thermostat increase of only 4°F in summer can reduce electrical requirements for air conditioning by one third. Nationally that 4°F increase could save 380,000 barrels of oil a day. Estimates for winter savings show a 7°F reduction can save 14-21% of the heating energy. For those who cannot adjust to the 68°F daytime temperature, similar savings are available during night time if thermostats are reduced for a full eight hours. Percentages are not conclusive for shorter time spans. It should be noted that in 1920 our average indoor winter temperature was 70°F compared with 75°F before the Federal Energy Administration's guidelines. This is an increase of 1°F per decade. It would seem that we could readjust to the 1920 level without extreme discomfort.

Clothing is our major tool for helping us be comfortable at less desirable temperatures. Studies show that an 80% acceptability range of winter temperatures from 68-70°F is attained by wearing clothing of .09 to 1.2 clo provided proper care is taken to cover arms and legs. Converting clo to thickness, 1.6 clo is equal to one cm, or there are 4 clo in an inch thickness (Fourn and Hollies 1970). To attain 1.2 clo would not require a great deal of thickness. An army arctic uniform is 4.3 clo and that is generally considered the highest clo used (Goldman "Thermal Comfort Factors: Concepts and Definitions"). No loss of dexterity begins to occur in the fingers until the temperature is reduced below 65°F (Gagge 1977).

Similarly, summer guidelines can be made 80% acceptable by wearing less than 0.4 clo. Increasing air movement or reducing relative humidity can also make us more comfortable at higher temperatures. Both of these methods require energy, but less energy than

using air conditioning alone to achieve comfort. A decrease in performance of manual and mental tasks is not measureable until temperatures reach above 90°F (Gagge 1977).

CLO INSULATION UNITS

Men		Women	
Underwear			
Sleeveless	0.06	Bra and Panties	0.05
T shirt	0.09	Half Slip	0.13
Underpants	0.05	Full Slip	0.19
Torso			
Shirt		Blouse	
Light, short sleeve	0.14	Light	0.20
long sleeve	0.22	Heavy	0.29
Heavy, short sleeve	0.25	Dress	
long sleeve	0.29	Light	0.22
(plus 5% for tie or turtleneck)		Heavy	0.70
Vest		Shirt	
Light	0.15	Light	0.10
Heavy	0.29	Heavy	0.22
Trousers		Slacks	
Light	0.26	Light	0.26
Heavy	0.32	Heavy	0.44
Sweater		Sweater	
Light	0.20	Light	0.17
Heavy	0.37	Heavy	0.37
Jacket		Jacket	
Light	0.22	Light	0.17
Heavy	0.49	Heavy	0.37
Footwear			
Socks		Stockings	
Ankle Length	0.04	Any Length	0.01
Knee High	0.10	Panty Hose	0.01

Shoes		Shoes	
Sandals	0.02	Sandals	0.02
Oxfords	0.04	Pumps	0.04
Boots	0.08	Boots	0.08

Table derived from studies at Kansas State University (Goldman "The Role of Clothing in Achieving Acceptability of Environmental Temperatures Between 67°F and 85°F")

ENERGY PROPERTIES OF TEXTILES

Textiles do not have energy properties of their own, but they do have energy saving characteristics (Wool Bureau, letter). Their most important energy saving characteristic is their ability to hold still air which is considered the best insulator. Listed below are some comparisons of thermal conductivity values of materials measured in calories per second per square centimeter per degree centigrade per centimeter thickness. Still air is the slowest conductor listed and the best insulator (Horn 1968).

Material	Thermal Conductivity Value
silver	0.99
glass	0.0025
human tissue	0.0005
leather	0.0004
paper	0.0003
wool felt	0.000125
pure wool	0.000084
still air	0.000057

Insulative Values of Textiles

Recognizing that air is the best insulator, it is important to understand which fibers are best at holding still air. Wool fibers are seldom 20-30% fiber in total weight, the remaining 70-80% of their weight is air. Their natural crimp makes them an excellent air holder. Other natural animal hair fibers hold air well, too. Although the ability of polyester "to provide thermal insulation for the body has not been clearly established" (Scruggs and Dickey "Textile Products: Thermal Insulation and Comfort Qualities for Indoor Winter Environments"), new methods of constructing polyester fibers, such as forming hollow

air spaces in the center of the fiber, give thermal characteristics to polyester fibers, too.

In selecting fabrics for insulative characteristics, each part of the fabric's construction is important. At the fiber and yarn stage, staple length fibers loosely twisted into textured yarns give a loftiness without weight which can hold air better than tightly twisted filament yarns. The weave of the fabric may vary in tightness, but air is still a major factor as even the most tightly woven fabric is usually less than 50% fiber content with air making up the remaining 50% of the fabric's weight. Raising nap to make fuzzy surfaces and cutting pile increases the air holding ability of fabrics. Knit fabrics entrap more air than woven ones, but knit is more porous allowing for wind penetration so knit would be fine indoors, but poor outdoors. Foam provides 30% better insulation than an equal thickness of fabric (Scruggs and Dickey "Textile Products: Thermal Insulation and Comfort Qualities for Indoor Winter Environments").

The feeling of warmth that we associate with fabrics is due to their surface structure. When we touch a smooth, flat surface such as metal or wood, we feel cool. This is because there is a maximum degree of contact between our skin and the heat absorbing surface. When we touch a fiber like wool, we feel warm because wool's crimped surface keeps us from contacting very much surface so we are actually feeling mostly air. This is known as the transient contact effect and explains why we associate warmth with some fibers (Fourt and Hollies 1970).

Fabric thickness with light weight is the most reliable indicator of insulating value. Fibers are heavier than air, so in choosing between two equally thick fabrics the lighter one would contain the most air and be the better insulator. In comparing 16 battings, Scruggs and Dickey found the fiber type and density to be insignificant. Thickness and weight were the important insulating factors. Korlinski states that under free convection conditions fabric thickness is an indication of insulative value (*Textile Progress*, Vol. 9, 1977). Free convection would not include the effects of wind, moisture, or reflective conditions.

Insulative Value of Air Layers Between Fabric Layers

An insulative layer of air called a film layer is present on both the skin and fabric surfaces. This layer is caused by frictional drag between the moving air and the roughness of any surface (Fourt and Hollies 1970). This film layer of air adds insulation to both sides of the fabric and the skin. These layers of trapped air add to the total insulative value of the clothed body.

Understanding that air is the best insulator, it is important to find the most effective way to use textiles to trap still air. Because the film

layer is almost 100% air, it would have better insulating properties than the same thickness of fabric which would be 50-70% air in most cases. Insulative fabrics should not be so limp that they collapse against the body and destroy the layer of air. Using several layers of clothing is an effective way to trap air. This is why two light weight sweaters can add more total insulation than one heavy sweater, but there is a limit to the efficiency of layering. The insulating value of 5 layers is approximately the same as 9 layers. There is also a limit to the practicality as many layers become bulky and inhibit movement.

Effect of Moving Air on Thermal Comfort

Air must be still to be insulating. Body movement can cause a tunneling effect as air is brought into loose clothing openings and circulated around the body and out other clothing openings. This internal ventilation serves to cool the body by allowing for increased evaporation. Summer clothing which fits loosely and is unbelted uses this chimney effect to cool the body. In winter, clothing should fit close enough to keep air from moving, but loose enough to allow for an insulating layer of air. Openings such as neck, wrists, and legs should be snug to prevent tunneling.

Wind also increases air movement cooling the body. Tightly woven or coated fabrics which allow for little wind penetration are helpful in winter, but they should allow for moisture transportation from the body.

Effect of Moisture on Thermal Comfort

Moisture can be transported through fabrics in either the vapor or liquid form. In the vapor form, moisture passes through the pores of the fabric; but the pores are left open so that their insulative air space is maintained. In the liquid form, skin moisture is wicked to the fabric surface and through fabric pores clogging the pores so that they cannot maintain their insulative air. The process causes discomfort by a wet, clammy feeling when skin wetness is more than 20%. Moisture can also cause clothing to stick to the body which eliminates the insulative layer of air between the body and clothing. Conversely, lack of moisture in fabrics can cause "static cling" which also destroys the insulative air layer (*Textile Progress*, Vol 9, 1977).

Generally, natural fibers are more absorbent than synthetics. Wool can hold 30% of its weight in moisture without feeling wet to the touch. Cotton, linen, and silk are also absorbent. Nylon and dacron do not absorb well, and the excess moisture accumulates on their surfaces. Rayon is a synthetic fiber that is absorbent.

Moisture transport is particularly important in rain wear where

body moisture in the form of vapor must be allowed to pass through the fabric, but moisture from rain must be kept out.

Reflective Properties of Textiles

The skin is a very poor reflector. White skin reflects about 30-40% of the sun's rays while Negro skin reflects about 18% (Horn 1968). Clothing is especially useful when the sun shines directly on the body as the effective temperature in the sun is 10°F higher than the actual air temperature (McClellan 1976). White or light colored clothing which covers both the body and the head is effective at reflecting the sun's rays and stopping wind penetration in desert areas. Dark clothing is useful in absorbing the sun's rays.

Metallic reflective fabrics are useful in reflecting both the sun's rays and the body's heat. To be effective these reflective fabrics must be directly toward the source they are reflecting. Reflective fabrics lose their value if they are put between other fabric layers. Thermolactyl is a recent synthetic designed to reflect body heat promoting circulation in the tiny blood vessels just under the skin. Thermolactyl also allows for free evaporation (Osgood 1978).

DRESSING FOR COLD WEATHER

Skin temperature is the indicator of thermal discomfort in cold weather. The hands and feet act as "error regulators" for the body. Approximately 20% of the body's heat is released through the hands, 10% through the feet, 50% through the head, and 30% through the torso (Stevens 1978). The circulatory heat input of a comfortable, resting person's fingers is 72 kcal/m² but falls quickly to 7 kcal/m² when the person begins to chill. The large surface area of the hands and fingers with their small amount of thickness makes them hard to keep warm. Arctic clothing manufacturers have not been able to make an effective mitten with more than 1.2 clo (Goldman "The Role of Clothing in Achieving Acceptability of Environmental Temperatures between 65°F and 85°F"). Mittens are much more effective than gloves because they allow the fingers to share body heat. Nishi reports that whole body comfort and comfort of hands and feet are not uniform. Additional sweaters do not alter the feeling of discomfort in the hands and feet although they do contribute to the general feeling of warmth. The addition of clothing to the trunk does serve to warm the blood as it circulates through the trunk, but this is not enough to warm the hands and feet effectively.

Footcoverings are especially important outdoors because they

often come in contact with moisture which increases heat flow from the body 24 times more than does dry air (Hollofil "Keeping Warm in Cold Weather"). Insulated rubber boots which prevent moisture penetration are much more effective than leather boots for outdoor wear. Indoors where moisture is not a problem shoes for winter should be of a closed style with no open toe or heel areas.

Socks can be selected in a wide range of fiber contents and styles. Wool with terry lining gives insulation and absorbency as well as cushioning for joggers. Heavy wool "rag" socks offer good insulation. Goldman reports that battery heated socks and mittens can give comfort in arctic conditions with as little as 3 watts to each hand and 5 watts to each foot. For those in extreme cold, auxiliary heat such as that provided by batteries allows for warmth without fabric thickness that could inhibit movement. Women can dress warmer by using socks instead of hose. Socks are available in several lengths from ankle to full "sweater tights" which fit like pantyhose. If hose are worn, textured ones offer more air holding ability than flat hose.

Long underwear is available in three major types: fishnet, knit, and insulated. Personal comfort is the most important consideration in selecting long underwear because, unlike sweaters, they cannot be easily removed when temperature or activity levels change. Underwear that might keep a sedentary person comfortable can quickly become too warm and moisture laden as the person's activity level increases. Absorbency is especially important with activity. Natural fibers might not be more absorbent than synthetics because processing done to make cotton and wool washable affects their absorbency. The outdoorsman might select a separate shirt and insulated long pants made of three layers. The first layer should be of a soft, absorbent material such as cotton; the second layer of fiber filling; and the outer layer of a tightly woven fabric for durability and strength. Down has not been satisfactory as an inner layer of underwear because it holds moisture and does not allow for evaporation. The three layers are usually quilted together. Indoor underwear is usually thermal knit with tiny air pockets which must be covered with another layer of clothing to form an insulative layer of air spaces. *Consumer Research* (December 1979) rated rachel knits which have narrow air spaces alternately positioned on both sides of the fabric as more desirable than circular knits which have narrow spaces that run the length of the fabric. *Good Housekeeping* (November 1978) rated waffle, honey, interlock, double layer, ribbed, pointelle, fishnet, and Vinyon acrylic. Bruche Vinyon acrylic received their best rating, but it must be line dried as it shrinks in the clothes dryer. Thin cotton waffle knit received their lowest rating for thermal insulation.

The upper torso is the most practical area for layering as sweaters and jackets can be easily removed anywhere. Turtlenecks, ties, snug cuffs, and belted styles are good at keeping heat in and avoiding ventilation with body movement.

The lower torso can be covered with woolen pants that fit snugly enough to be tucked inside the boot. Wool fleece has a clo value of 0.285 while wool serge is only 0.111 clo so it is important not to select a thin, flat wool (Fourt and Hollies 1970). Borrowing the words from the shampoo commercial, choose "fluffy, not flat" fabrics. Quilts, piles, naps, and battings are all suitable for the torso. Outer jogging style pants that zip above the ankle can be pulled over boots for extra insulation in times of low activity and removed easily when activity increases (Osgood 1978). Especially outside it is important to remember the more you do, the less you wear. Cotton jeans conduct heat away from the body very rapidly when they are wet and offer little wind resistance so they are poor outdoor winter wear.

Outerwear for winter is available in a wide variety of styles and fabrics. To take advantage of the sun, outerwear should be dark for heat absorbency or a warm hue such as red, purple, or yellow for a feeling of warmth ("Keeping Warm" University of Kentucky). Fit should be snug enough to avoid ventilation from wind or body movement. Belting helps prevent wind from moving from the bottom opening to the top of a coat. *Good Housekeeping* (October 1978) rated 16 coats and found a rip stop nylon ski coat filled with down to be the best insulator. A smooth leather flight jacket with acrylic pile lining rated last. The thicker battings of down, Hollofil, and polyester are finding competition on the market from the newer thin insulators. Thinsulate was developed by the 3M company and is made of tiny polyolefin fibers. It absorbs less than 1% of its weight in water, dries quickly, and retains its loft. Sontique is made by DuPont from dacron. It offers 70% of the insulation value of an equal weight of Hollofil in a much thinner product. Thinsulate and Sontique can be used in more styles with a more tailored look than the fluffier battings.

Gore-Tex is another new product used in outerwear. It was introduced in 1976 after having been made for medical use as artificial blood vessels (Osgood 1978). Gore-Tex is made of a film of polytetrafluoroethylene (Teflon) and is finding a great deal of use in the outdoor sportsman's market. Work has also been done on reflective materials for outerwear. Goldman ("Evaluating the Physiologic Effects of Clothing on the Wearer") reports that the failure of a highly publicized reflective coat lining discouraged the use of reflectives. However, new techniques for depositing reflective materials on tough plastics and nonwovens appear more successful. Housecoat Garments, Ltd. of

London has introduced a bathrobe style coat for older people that retains up to 80% of the body heat. It has been called a "Spacecoat" because the lining is a thin deposit of aluminum on Tyvek, a non-woven product similar to material used by NASA (*Design News* 1978). Sandwiching several layers of batting between two reflective layers has been effective at reflecting body heat, but it has been difficult to construct the layers into outerwear because of compression during construction. (Goldman "Evaluating the Physiologic Effects of Clothing on the Wearer").

The outdoor sportswear market has contributed to outerwear development. Flannel Nyle, which was originally made to cover the windshields of light airplanes, has been used by sportswear manufacturers to produce jogging suits. Antron nylon is used on the outside surface of the jogging suit to repel wind and moisture; Flannel Nyle provides the middle layer, and absorbent cotton is next to the skin. These layers form a breathable, weather resistant fabric that is light weight and can be tied around the waist when not worn. A winter jogging suit includes a cotton polymesh inside that acts as thermal underwear trapping the heat from body activity. In extreme weather, both the winter and summer suits can be worn together. Kabiak, the designer of the suits, states that "we have discovered that by eliminating or minimizing the pain inflicted by the elements we are free to concentrate on the pain we inflict on ourselves" (Campbell 1980). The sportswear market for outdoor recreation has made substantial contributions to thermal comfort in outerwear.

Headgear should receive particular attention because of the large amount of heat that can escape from the head. Hats, scarfs, face masks, and ear coverings should fit snugly.

DRESSING FOR SUMMER

Skin moisture, rather than temperature, is the indicator for summer thermal comfort. A 20% wetness on the skin's surface is perceived as uncomfortable. Evaporation is more effective from the skin than from fabrics, so if evaporation were the only consideration one would be more comfortable without clothing. Since there are other considerations, such as modesty, it is essential to select an absorbent fabric that will interfere as little as possible with evaporation. Goldman ("Underclothing and its Physiological Effects in a Hot-Dry Environment") reports that as little underwear as possible should be worn. He found no advantage to fish net ("Norse Net") or ladder net fabrics which claimed cooler underclothing. Pantyhose should be

avoided in summer, or if worn, should have a cotton insert or cotton top. Men's socks should be light weight and absorbent. Cotton is a good summer sock fabric. Shoes should be of breathable material with as many openings as possible. Sandals offer the most summer comfort.

The torso should be covered with light colors that reflect the sun's rays. Being in direct sunlight can add 10° effective temperature, so care should be taken to cover the body and head with reflective colors. Indoors cool colors of blues and greens add to a feeling of coolness. Flat fabrics, such as linen, which do not hold air are comfortable especially with open weaves. Clothing should fit loosely around the body and at openings such as the neck and arms. This allows for ventilation from body movement and wind. Men should avoid ties and wear unlined coats if coats are needed for their jobs. Women will be cooler in skirts than slacks. As much as possible, clothing should be kept to one layer. Accessories such as jewelry and belts add a feeling of warmth and should be avoided.

NON-CONTACT TEXTILES

In addition to the textiles used in clothing, there are textiles in our environments which do not come in direct contact with our bodies. These non-contact items include carpets, draperies, wall coverings, and insulative materials that are added to the shells of houses. They are valuable for their insulative and reflective properties.

In a Monsanto study it was found that carpeting with a fibrous pad offered up to 53% more insulation than a hard wood floor (Crippen "Savings Data"). Vigo reported carpets as 54% more insulative than wood and 72% more insulative than concrete (Vigo and Hassenboehler "Effective Use of Textiles for Energy Conservation"). Clinard found R values for vinyl floors to be 0.05, carpets with fibrous pads 2.08, and carpets with foam pads 1.23. Research at Kansas State University has shown carpeted homes are 5-13% less expensive to heat than uncarpeted homes, but Hager reported carpeting to be of little insulative value in multistory buildings (Crippen "Savings Data"). The insulative value of carpeting is a function of thickness and pile density. Fineness of filament, thread count, and fiber crimp should also be considered in selecting carpets for their thermal properties.

Renner and Smith estimated that 50-70% of summer cooling cost is caused by heat from the sun coming in windows. Conversely, 30-45% of winter house heat escapes through windows (Crippen "Savings Data").

The value of solar shades and reflective films or add-on-insulators

can be substantial. A single pane window can transmit 85% solar energy; a film covering can reduce this to 21%. A window screen made from glass fiber filaments that are coated with vinyl before weaving has been found to filter out 75% of the sun's heat (Vigo and Hassenboehler) and is also effective in reflecting house heat in winter.

There is some controversy over the value of foam backings on draperies as to whether the trapped cold air is eventually drawn into the room by the warmer room temperature (Crippen "Savings Data"). However, Dix and Lavan reported that a medium colored drapery with a white plastic backing can reduce the conductive heat loss in winter by 6-7%, and reduce conductive and radiant heat in the summer by 33% (Vigo and Hassenboehler). They concluded that shades and inside casements were more effective than draperies in reducing winter heat loss. If draperies are used alone, their ability to block air flow should be their most important factor. Proper installation is important so that convection does not occur from the ceiling, under the curtain, and out the floor.

Little work has been done on the insulative value of wall coverings, but mathematical equations have been developed to calculate the insulative value of the air space formed between the wall and wall coverings (Vigo and Hassenboehler).

INDIRECT CONTACT TEXTILES

Indirect contact items include bedding materials and upholstered items, but bedding materials offer more insulation since they surround the body. Thermal blankets have an open weave construction that provides spaces to trap insulative air when a conventional blanket is used on top of them in cold weather. In warmer weather when insulation is not desired, the thermal blanket can be used alone with the open weave allowing heat to pass from the body. *Consumer Reports* (December 1979) evaluators found the insulation value of some conventionally woven blankets increased with washing due to shrinkage which produced a tighter weave. Body blankets, which are used for sitting rather than sleeping, zip up the front and have arm holes to allow you to use your hands. The body blanket allows you to keep your thermostat at an activity level while keeping you comfortable at a resting level.

Several types of insulators are available for bedding comforters. Down, which is the soft, fluffy portion of a goose's undercoating, is the warmest comforter insulator for its weight and is highly resilient, but it mats when wet and loses its insulating properties. Polyester batting

is heavier and less compressible than down, and it also loses its insulating ability when wet. Of the polyester battings, Hollofil provides the most warmth per unit weight because its fibers are constructed with hollow centers allowing for trapped insulative air. Many of the battings require quilting to keep them in place. PolarGuard is made of continuous filaments that form a stable sheet so no quilting is required. Needlepunching is another method of forming a stable product where fibers are interlocked into a base fabric. These battings may also be used for sleeping bags and outerwear. Nylon rip stop, a tightly woven fabric with two threads twisted together for additional strength throughout the weave, is often used as an outer garment cover for batting filled coats (Coats and Clark Inc. "Nylon Ripstop and Taffeta").

SUMMARY

In summary, guidelines for winter dressing include:

1. Select fabrics that hold air well
2. Use layers of clothing
3. Keep clothing snug, but not tight enough to destroy the air layer, and keep openings closed
4. Keep head, hands, and feet covered
5. Use absorbent, dark colors, or warm colors
6. Keep absorbent fabrics near the skin

and for summer:

1. Select flat fabrics with open weaves
2. Use one layer
3. Wear loose clothing
4. Use absorbent materials
5. Wear white, reflective colors, or cool colors.

With the increased interest in energy, many people have found it a perfect time to investigate the thermal comfort of clothing. Some believe most progress can be made in new products. Grieter is working on an ultra-violet radiation permeable fabric that will allow sun tanning while clothed. Hansen is working on solvents in hollow elements of fabrics that would solidify and expel a gas which would inflate the hollow elements increasing their thermal insulation value (*Textile Progress* 1977). Others believe with Mecheels (Crippen "Design Guidelines") that the "fastest route is to use knowledge

already available" and further explore knits. In either case, thermal properties of fabrics offer a challenge to many areas of scientific research.

CONCLUSIONS

Effective use of the energy properties of textiles in clothing can allow individual thermal comfort within the FEA guidelines of 68-70°F winter and 78-80°F summer temperature ranges. With motivation many individuals can adjust to stricter guidelines. Thus, textiles properly used in clothing can offer energy savings by allowing conservative thermostat settings without sacrificing thermal comfort.

Non-contact and indirect contact textiles used within the home offer insulation which further reduces the amount of energy needed to maintain space temperatures. Textile products such as draperies allow the home occupant to manage the environment by opening south facing draperies during the day for solar gain and closing them at night to prevent heat loss.

Clearly, textiles can provide substantial energy savings. With further research in developing and measuring textiles for thermal comfort, the consumer can realize greater energy savings.

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A HISTORICAL APPROACH TO THE UNDERSTANDING OF CIVIL DISOBEDIENCE

by Lanna G. Martin

Even though the term "civil disobedience" has existed only one hundred thirty-one years, the principles of the term have been enacted since Biblical times. Hugo A. Bedau's definition elucidates those principles when he states that civil disobedience is "an act which is committed illegally, publicly, nonviolently, and conscientiously with the intent to frustrate (one of) the laws, policies, or decisions of...government."¹ Charles Frankel, in his article, "Is It Ever Right to Break the Law?," further elaborates civil disobedience, saying, "The goals of those who disobey the law have to lie at the very heart of what we regard as morality before we can say that they have a moral right (not legal) to do what they are doing,"² and the civilly disobedient person must be willing to suffer or even to die for his cause.³ Richard Wasserstrom, writing in *UCLA Law Review*, states the two views of civil disobedience: "One certainly has the right to disobey the law and one must never disobey the law."⁴ President John F. Kennedy in a speech advocated the latter view:

Our nation is founded on the principle that observance of the law is the eternal safeguard of liberty and defiance of the law is the surest road to tyranny.... Americans are free, in short, to disagree with the law, but not to disobey it.⁵

Historically, however, the view that an individual does have the right to disobey the law has been stronger. During the reign of Nebuchadnezzar in Babylon, an important act of civil disobedience occurred and is recorded in the Book of *Daniel* in the Bible. In 585 B.C. King Nebuchadnezzar decreed that all of his subjects must "bow down and worship a huge golden idol or else be thrown into a fiery furnace."⁶ Shadrach, Meshach, and Abednego—three friends of Daniel—⁷ decided that they could not obey this law, because it violated the higher law of God;⁸ therefore, the three men were civilly disobedient when they acted "illegally, publicly, nonviolently, and conscientiously."⁹ According to the Biblical account, the men were thrown into the furnace and were saved by God. Their act of civil disobedience was effective, because Nebuchadnezzar changed the law.¹⁰

Much later in history, St. Augustine (A.D. 354-430) and St. Thomas

Aquinas (1225-1274) considered the relationship of man, human law, and divine law. St. Augustine's thoughts concerning human conduct and human destiny were "molded very largely by the New Testament and by the Christian church's tradition in understanding its conception of divine law and commandment."¹¹ One of St. Augustine's statements on law is often quoted in the study of civil disobedience: "A law that is not just seems to be no law at all."¹² St. Thomas Aquinas included this statement of Augustine in *Summa Theologica* (1266-73)¹³ and from this thought concludes that unjust laws do not bind a man in conscience,¹⁴ an idea which he elaborates by saying, "Laws may be unjust through being opposed to the Divine good. Such are the laws of tyrants inducing idolatry, or to anything else contrary to the Divine Law; and laws of this kind must in no way be observed, because as stated in *Acts* 5:29, 'We ought to obey God rather than men.'¹⁵ Aquinas encourages the use of civil disobedience when human law contradicts the Divine law.

For modern examples of civil disobedience, one needs to examine the thoughts and actions of Henry David Thoreau, the author of the now-famous essay, "Civil Disobedience," which provides the term itself; of Leo Tolstoy and his doctrine of non-resistance to evil in Russia; of Mohandas K. Gandhi and his satyagraha campaigns in South Africa and India; of Dr. Martin Luther King, Jr., and his philosophy of non-violence in the United States; and of Alexander Solzhenitsyn and civil disobedience in the Soviet Union. An examination of these leaders of the principles of civil disobedience reveals that exchanging of thoughts, ideas, and literature occurred among them, and these exchanges directly or indirectly caused other similarities in their theories and practices of civil disobedience.

The term "civil disobedience" is attributed to Henry David Thoreau; it came into being as a result of his spending a night in the Concord jail for refusing to pay his poll tax.¹⁶ His short stay in jail "left an indelible impression" on him, and after thinking for two years about his conflict with the government, he wrote in 1849 "Civil Disobedience,"¹⁷ "a sharp statement of the duty of resistance to governmental authority when it is unjustly exercised."¹⁸ One author when referring to Thoreau said, "He made an essay called 'Civil Disobedience' out of his prison experience, fusing the soft coal of his night in jail into solid diamond."¹⁹ As a result of the publication of "Civil Disobedience," many followers—greater and lesser—arose, including Gandhi, King, Tolstoy, Solzhenitsyn, and others like William Butler Yeats, W. H. Hudson, and H. M. Tomlinson,²⁰ all of whom adhered to the principles concerning the "defense of the private conscience against majority expediency."²¹ The difference between Thoreau and

his followers was that he did not like people as much as they; as a matter of fact, "(Walt) Whitman discerned in him 'a morbid dislike of humanity.'²² Much of what Thoreau wrote was based on or was inspired by what he read. He was interested in India and in the *Bhagavad Gita*, the *Veda*, and the *Upanishad*.²³ (Later, Gandhi read and was influenced by these same writings.)²⁴ In addition to these Indian religious classics, Thoreau also read the Bible and used it to support some of his statements in "Civil Disobedience":

For eighteen hundred years, though perchance I have no right to say it, the New Testament has been written, yet where is the legislator who has wisdom and practical talent enough to avail himself of the light which it (the New Testament) sheds on the science of legislation?²⁵

Later in the essay, Thoreau speaks of the role of man's conscience:

Must the citizen even for a moment or in the least degree resign his conscience to the legislator? Why has every man a conscience, then? I think that we should be men first, and subjects afterward.... The only obligation which I have a right to assume is to do at any time what I think is right.²⁶

Thoreau further encouraged individuals to act according to their consciences by saying, "For it matters not how small the beginning may seem to be: what is once done well is done forever."²⁷ Insistent "that his business was not to change the world but to solve the problems of living in it,"²⁸ Thoreau honestly tried to solve the problems that he saw and provided support, in the form of his essay, for his followers. The impact of Thoreau's ideas was greater than his age had suspected.²⁹

Evidently, Tolstoy had read Thoreau's "Civil Disobedience," because in a letter to a revolutionist, he referred to the essay: "In America, for example, the question was worked out from all sides fifty years ago..."³⁰ Most scholars agree that Tolstoy was aware of Thoreau's essay as he was defining his doctrine of non-resistance to evil. But primarily, his experiences with religion and social conditions in Russia were the bases of his doctrine. In his adult years, Tolstoy suddenly realized the existence of God. Tolstoy wrote: "I live, really live, only when I feel Him and seek Him."³¹ After this religious awakening, Tolstoy returned to "the faith of his father"—the Orthodox Church,³² but soon after his return to the Church, he became distressed by inconsistencies within the Church: he could not understand how any church could pray, "Vanquish the enemies," when he felt that the churches should pray for

their enemies.³³ In his diary, March 5, 1855, Tolstoy wrote:

To-day I received communion. Yesterday a conversation about Divinity and Faith suggested to me a great, a stupendous, idea to the realisation (sic) of which I feel capable of devoting my life. That idea is the founding of a new religion corresponding to the present development of mankind: the religion of Christ out purged of dogmas and mysticism—a practical religion, not promising future bliss but giving bliss on earth.³⁴

Tolstoy left the Orthodox Church and turned to the New Testament, and during this next period of this life, he put aside most fictional writings for informative thoughts about “his findings in the Gospels.”³⁵

Tolstoy did devote the remainder of his life to this new religion, which became his doctrine of non-resistance to evil. He employed non-resistance to help those people trampled by the powers of the state. Tolstoy found his rule of non-resistance to evil in the Sermon on the Mount, in the New Testament: “Resist not evil.” (*Matthew 5:39*)³⁶ From the Sermon on the Mount, Tolstoy drew several other principles of his doctrine, recording them in a long essay titled, “What I Believe”:

- (1) Christ bids us not be angry with anyone.
- (2) Never resist the evildoer by force; do not meet violence with violence. If they beat you, endure it.
- (3) Account all men as brothers. Love them and do good to them. Men need only trust Christ’s teaching and obey it and there will be peace on earth.³⁷

During the 1880’s, he used pamphlets, essays, and his literary works to spread his ideas and doctrine; “There was indeed hardly an evil that escaped Tolstoy’s scrutiny.”³⁸ He felt that it was “his duty to tear off all masks in order to show the ugly face of reality.”³⁹ This mass of writings was “peddled all over Russia” to open the eyes of the aristocrats and “over-refined intellectuals and the half-literate peasants and factory workers; the Tsarist police allowed Tolstoy to spread his ideas because they did not want to make him a martyr.”⁴⁰ According to one author, Tolstoy attempted “to state ‘the religion of Christ . . . purged of dogmas and mysticism’ ” in *What I Believe* (1884), *The Gospels in Brief* (1892), *The Kingdom of God Is Within You* (1893), and *What Is Religion and Wherein Lies Its Essence* (1902).⁴¹ Probably the two most influential of Tolstoy’s religious works were *The Kingdom of God Is Within You* and *The Resurrection* (1899); the former demon-

strates the “futility of war, condemning munitions dealers, generals, and the Orthodox Church as violence-mongers”⁴² and, later, became inspirational to Gandhi;⁴³ the latter created a stir among the peasants and among the government officials in Russia.⁴⁴ Also during this period of intense dedication to the futhering of his doctrine, Tolstoy wrote a letter entitled, “On Non-Resistance to Evil,” in which he stated his rule and his reasons for the formulation of the doctrine.⁴⁵

Tolstoy aided many groups who were powerless to the State. In 1891 in the provinces of Central Russia, “a devastating famine” occurred,⁴⁶ and Tolstoy and his helpers kept the people alive by furnishing soup kitchens, by providing warm clothes, and by Tolstoy’s pleading to the upper-class for money; the Church and the State sent nothing.⁴⁷ Tolstoy also worked to help the *doukhobors*, the Russian non-conformist sect, because he agreed with their principles of “condemnation of violence, of taking life and of all church-ritual,” and because they were persecuted by the State.⁴⁸ Tolstoy did not confine his condemnation of the State to Russia. He sent a fiery description of the mistreatment of the *doukhobors* to London, and the description was published as *The Persecution of the Christians in Russia in 1895*.⁴⁹ Of course, by this time the State had begun to censor, to confiscate, and to suppress Tolstoy’s work.⁵⁰ Hurriedly, he completed *The Resurrection* and gave the profits to the *doukhobors*.⁵¹

As a result of his efforts for the non-conformist sect and his scathing attack on the Orthodox Church in *The Resurrection*, Tolstoy was excommunicated in 1901.⁵² Although he was banned from his church, censored, and suppressed by the State, he was able to reach and to help millions of Russians, who loved and cheered him,⁵³ but he also was able to reach millions of other oppressed people by the spreading of his thoughts and ideas by way of his literature.

No doubt, Thoreau’s “Civil Disobedience” influenced Mohandas K. Gandhi. In fact, author Max Lerner comments that the essay became “the foundation of the Indian civil disobedience movement.”⁵⁴ Actually, Gandhi’s experience with the principles of civil disobedience began before 1907, when he is supposed to have read the essay.⁵⁵ As early as 1893, Gandhi had a “critical experience” in Pietermaritzburg, South Africa; Gandhi, who held a first-class railroad ticket, was pushed by a white guard from the compartment into the waiting room. Remembering this experience, Gandhi later said, “My active non-violence began from that date.”⁵⁶ After completing his legal studies in London in 1891, Gandhi began a law career which floundered until it gained momentum about 1894,⁵⁷ at which time Gandhi began to visit India, where “he took over a weekly publication called *Indian Opinion* to fight the settlers’ cause.”⁵⁸ Before Gandhi introduced his term “satyagraha,”

made "an extensive study" of Tolstoy's *The Gospels in Brief and What to Do*. In 1907 Gandhi finally wrote to Tolstoy and a correspondence ensued. Gandhi attempted to live by the precepts of the Sermon on the Mount as a result of his contact with Tolstoy,⁸⁰ and much of the Sermon on the Mount became important to *satyagraha*, particularly the verse, "...ye resist not evil,"⁸¹ which was the crux of Tolstoy's non-resistance-to-evil doctrine. Tolstoy caused Gandhi to believe in the possibilities of universal love,⁸² which, Tolstoy said, could be accomplished only with non-violence. Gandhi said:

I believe non-violence is infinitely superior to violence, forgiveness is more manly than punishment. . . Strength does not come from physical capacity. It comes from an indomitable will.⁸³

Possessing an "indomitable will" and being "a blend of the East and the West, of the ancient and the modern"⁸⁴ Gandhi led and loved his people.

After having read Thoreau⁸⁵ and Gandhi,⁸⁶ Dr. Martin Luther King, Jr., formed his philosophy of non-violence to help blacks in the United States attain their civil rights,⁸⁷ which, King believed, the white majority had previously ignored or abused. King's first knowledge of "Civil Disobedience" came when King was attending Morehouse College. He stated that the essay "stirred him more deeply and permanently than any other classroom encounter."⁸⁸ In a discussion with his wife, Coretta, he explained his emotions when he first read the essay. He dated the genesis of his philosophy of non-violence from that reading.⁸⁹ He vowed that the next time he was confronted by an "evil law" he would meet the law with non-violence; that confrontation arose during the Montgomery Bus Boycott in 1956.⁹⁰ The actual boycott, an "instance often thought of as the epitome of civil disobedience, was, in fact, lawful protest,"⁹¹ but other protests which followed the Bus Boycott breached local ordinances and therefore were civil disobedience; for example, the sit-ins, the demonstrations, and the "freedom rides" violated local laws.⁹²

In 1959, after much thought of Gandhi and non-violence, King, Coretta, and a friend, Professor Reddick, journeyed to India, where they met with top scholars to discuss Gandhi and *satyagraha*.⁹³ King returned to the United States, where his first uses of non-violence were encouraged by "white intellectuals, politicians, and other public officials."⁹⁴ In early 1963 in Birmingham, Alabama, King led mass demonstrations to fight segregation.⁹⁵ Violence erupted, King was arrested, and the nation was outraged.⁹⁶ During his stay in jail, King

received a letter from eight Alabama clergymen, urging King to use "proper channels" in government to achieve his goals.⁹⁷ King replied with his now-famous "Letter from the Birmingham City Jail," in which he said:

We have waited 340 years for our constitutional and God-given rights. The nations of Asia and Africa are moving with jet-like speed toward the goal of political independence, and we still creep at horse and buggy pace toward the gaining of a cup of coffee at a lunch counter.⁹⁸

King, an avid reader of St. Augustine and St. Thomas Aquinas, continued his letter by quoting these men. Of St. Augustine's thoughts, King said:

There are just laws and there are unjust laws. I would be the first to advocate obeying just laws. One has not only a legal but a moral responsibility to obey just laws. Conversely, one has a moral responsibility to disobey unjust laws. I would agree with St. Augustine that 'An unjust law is no law at all.'⁹⁹

One reason that King so firmly advocated non-violence was that he believed that it could "touch men where the law cannot reach them."¹⁰⁰ King, like Tolstoy and Gandhi, enumerated the basic steps of campaigns of non-violence:

- (1) Collection of the facts to determine whether injustices are alive.
- (2) Negotiation
- (3) Self-determination
- (4) Direct action (protests, sit-ins, demonstrations, etc.).¹⁰¹

King used these steps in his non-violent campaigns of "March on Washington for Jobs and Freedom (1963), in which 200,000 participated,"¹⁰² and in Birmingham, Alabama (1963). After Martin Luther King's efforts, the Civil Rights Act of 1964 and the Voting Rights Acts of 1965 became laws.¹⁰³ These two acts were the first legislation passed to aid the blacks in striving for equality, and King's leadership of his people in the non-violence movements probably was the most important factor in the attaining of these civil rights.

Alexander Solzhenitsyn of the Soviet Union is perhaps the most famous and influential of the modern advocates of civil disobedience.

While residing in the Soviet Union, Solzhenitsyn condemned the idea on which communism was based: the idea that one group of people has the right to repress another group.¹⁰⁴ He also attacked the government's arbitrary use of power.¹⁰⁵ But what Solzhenitsyn abhorred the most was the communists' execution of political prisoners; he knew from his eleven-year prison term what brutality and terror existed within prison walls.¹⁰⁶ Solzhenitsyn's imprisonment provided ideas and details for his novels, but more important to the development of his doctrine of civil disobedience, his incarceration caused a spiritual transformation, which was probably the most momentous event in his life.¹⁰⁷ Since Communism stressed godlessness,¹⁰⁸ Solzhenitsyn, as a Christian, found more atrocities committed by the State. Solzhenitsyn and other Christians refused to believe the lies of the State; he urged the Christians to maintain their spirit and conscience.¹⁰⁹ Like Tolstoy, Solzhenitsyn put his protests into writing in the forms of letters, essays, articles, and novels.¹¹⁰ In his essay, "Live Not By Lies," he encouraged the Soviet citizens to refuse to be manipulated: "Let us refuse to say what we do not think."¹¹¹ Although Solzhenitsyn openly advocated moral revolution, which was to be accomplished by civil disobedience,¹¹² he realized that participation in such a movement could result in the loss of a job or a home or even in imprisonment.¹¹³ In spite of these possibilities, Solzhenitsyn told the people that this form of civil disobedience was still less dangerous than the form Gandhi and his followers used against the British administration in India.¹¹⁴ In *Dve Press-Konferentsii*, Solzhenitsyn proposed that if tens of thousands would participate in a program of "civic (sic) disobedience," the country would change "in months not years."¹¹⁵ The Soviet government in an attempt to silence Solzhenitsyn, whose number of followers was increasing, exiled him. Since his exile, he has developed a prophet-like nature—predicting the "imminent collapse of the West" with an urgent and "doom-laden tone."¹¹⁶ Solzhenitsyn has expressed the desire to return to the Soviet Union.¹¹⁷ Perhaps he feels that his work for the masses of persecuted people is not done. Solzhenitsyn's efforts and recent predictions have alerted the West to the current problems of these people of the Soviet Union, and he and his followers, including those still in the Soviet Union, are still trying to employ civil disobedience there in order to change the lives of oppressed Russian citizens.

From at least 585 B.C., when those famous three defied Nebuchadnezzar, men in different societies have enacted the principles of civil disobedience. Moreover, since the publication of "Civil Disobedience" in 1849, men have discussed and written about the applications of these principles. Thoreau, Tolstoy, Gandhi, King, and

Solzhenitsyn each defined and/or enumerated the tenets of his doctrine; read and borrowed ideas from other great leaders who effectively practiced and advocated civil disobedience; believed in God and relied on the New Testament; and insisted that man has a moral duty to follow his conscience when it conflicts with an unjust law. Thoreau and Tolstoy caused the great growth of the idea in the mid to late nineteenth century; Gandhi bridged the nineteenth and twentieth centuries with his satyagraha campaigns of non-resistance to evil, and King and Solzhenitsyn have left indelible marks in the history of civil disobedience during their efforts in the twentieth century. The efforts of these five men and their many followers to achieve a society based on just laws are recorded in a long history of civil disobedience, which began before Christ and continues even today.

ENDNOTES

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- ⁹⁰Cummings and Wise, p. 157.
- ⁹¹Morris, p. 654.
- ⁹²*Ibid.*, p. 655.
- ⁹³Lewis, p. 100.
- ⁹⁴*Ibid.*, p. 97.
- ⁹⁵Cummings and Wise, p. 158.
- ⁹⁶*Ibid.*, p. 159.
- ⁹⁷"Letter to M. L. King," *Basic Issues in American Democracy*, ed. Hillman M. Bishop and Samuel Hendel (New York: Appleton-Century-Crofts, Educational Division Meredith Corporation, 1970), pp. 282-3.
- ⁹⁸Martin Luther King, Jr., "Letter from a Birmingham City Jail," *Basic Issues in American Democracy*, ed. Hillman M. Bishop and Samuel Hendel (New York: Appleton-Century-Crofts, Educational Division Meredith Corporation, 1970), p. 285.
- ⁹⁹*Ibid.*, p. 286.
- ¹⁰⁰Lewis, p. 85.

- ¹⁰¹King, p. 284.
- ¹⁰²Cummings and Wise, p. 159.
- ¹⁰³*Ibid.*, pp. 160-61.
- ¹⁰⁴Niels C. Nielsen, Jr., *Solzhenitsyn's Religion* (New York: Thomas Nelson, Inc., 1975), p. 110.
- ¹⁰⁵*Ibid.*, p. 113.
- ¹⁰⁶Kathryn Feuer, ed., *Solzhenitsyn: A Collection of Critical Essays* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1976), p. 11.
- ¹⁰⁷Nielsen, p. 131.
- ¹⁰⁸*Ibid.*, p. 101.
- ¹⁰⁹*Ibid.*, p. 117.
- ¹¹⁰Feuer, p. 14.
- ¹¹¹Stephen Carter, *The Politics of Solzhenitsyn* (New York: Holmes and Meier, Inc., 1977), p. 104.
- ¹¹²*Ibid.*, p. 102.
- ¹¹³*Ibid.*, pp. 104-5.
- ¹¹⁴*Ibid.*, p. 104.
- ¹¹⁵*Ibid.*, p. 106.
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- ¹¹⁷Nielsen, p. 124.

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THE COMPUTER MANUFACTURING INDUSTRY AND THE BURROUGHS CORPORATION

by Tammy J. Atwood

Introduction

The use of computers to process and store information has permeated many fields in our society today. Computers are used in business, science, health care, home management and various other areas. Customers include industrial users, government agencies, business and professional groups, and homemakers. Some of the larger computer manufacturers are producing home computers to reach customers in this new market.¹⁸ With the increasing number of uses for computers, the world market for them has grown tremendously. The United States market comprises 48% of the total world market, followed by the Western European market with 30% of the total.¹⁹ The computer manufacturing industry is continuing to enjoy growing revenues and increased profitability. The purpose of this report is to examine the computer manufacturing industry more closely and to look at one company in that industry, the Burroughs Corporation.

The Industry

United States sales of computers and related equipment grew from \$14.5 billion in 1978 to \$17.9 billion in 1979.¹⁸ Products sold in this industry are divided into two groups: hardware and software. The mainframe computers (hardware) are divided into three classifications by processing capabilities and size of memory. These groups are large, mid-range, and small computers. Programming packages (software) are usually produced for the computer; however the trend now is toward "unbundling" or making the software and hardware less dependent on one another. More emphasis is now being placed on software as a marketable product in the industry.¹⁹ This new emphasis is largely due to the decreasing prices of hardware.

The cost of manufacturing hardware is expected to decrease 20% to 25%. This decrease can be attributed to the technological strides in semiconductors (an essential element in producing hardware). The price of memory storage will be substantially lowered and manufacturers should benefit from these lower costs.¹⁹

The main companies in this industry are IBM, NCR, Burroughs, Honeywell, Sperry Univac, and Control Data. Since the start of the

computer industry through the 1960's, the companies were referred to as "IBM and the seven dwarfs".¹⁵ Several of the early manufacturers (such as General Electric, Digital Equipment, and Scientific Data Systems) have since dropped out of the scene.⁹ Those who have survived are now multinational firms with revenues in excess of \$2 billion each. The giant of the group, IBM, has two-thirds of the electronic data processing market with revenues in excess of \$21 billion.¹³ The second largest mainframe producer, Burroughs Corporation, has revenues of only \$2.5 billion.²¹ Control Data, Honeywell, NCR, and Sperry Univac had revenues of \$2.2 billion, \$4.2 billion, \$3 billion and \$4.7 billion respectively in 1979.²⁰

Capital requirements for entry into this industry are exorbitant and a long-standing reputation for quality products is essential; therefore, the emergence of new companies in this industry is unlikely.² The existing five smaller companies are highly competitive with each other and with IBM.¹⁵ IBM sets the pace in the industry, however. All of the manufacturers have general product categories that parallel IBM's line. The only exception to this pattern is in minicomputers which IBM did not begin producing until 1977.¹⁵ Minicomputers represent the fastest growing area in the industry and their developers tend to be the most innovative. This is especially important since innovation is the single most important key to competitive success.¹⁵

The industry has a unique pricing situation. IBM's prices provide an umbrella for the other companies furnishing them with high profit margins; however, if IBM should change its strategy, pricing could become extremely competitive.¹⁹ As a general rule, IBM's prices are higher than the other's because of its high-quality service and operating support. Recently IBM introduced its new 4300 series which was priced aggressively and started a round of industry-wide price increases.²⁰ The sensitivity of prices in general to the actions of IBM and other indications of IBM's total dominance of the industry has led to a series of anti-trust litigations against the company.

The earliest litigations began as far back as 1932 when IBM was charged with restraining trade by requiring companies to use only the punched cards it produced for its machines. In January 1969, the Justice Department filed an anti-trust suit against IBM for monopolizing and attempting to monopolize the market for general purpose digital computers in violation of the Sherman Act. This eleven-year-old suit is still pending.²⁶ Government officials have announced their aim of modifying the structure of the industry in order to increase competition.² One task force has recommended its plan for dividing IBM into five separate companies, each having its own research and development, manufacturing, sales and service departments.⁶ Set-

tlement of this suit may not be forthcoming for quite some time but the consequences of the settlement could greatly alter the present structure of the industry and IBM's dominance of it.²³

The industry is currently enjoying a period of rapid growth which is expected to continue throughout the 1980's. Worldwide shipments rose 17% in 1979 and revenues rose 15% to 20%. These trends should continue and earnings for the six firms should increase 13% to 15%.²⁰ Even if the government's inflation-fighting policies create a deeper recession than is now expected, computer manufacturers should see a rise in profits due to the large supply of backorders to be filled and the continued striving of firms for greater operating efficiencies which the computer can provide.²⁰ Profit margins for the six firms may narrow, however, because of increased financing and other costs and because of the trend toward leasing computer systems rather than buying them.²⁰ This trend may be attributed to buyer's anticipation of radical new designs in IBM's recent and expected releases and to their reluctance to commit themselves until the effects of these releases are known.¹²

One trend which should help counteract the movement toward leasing and increase sales of hardware is the use of distributed data processing. Distributed data processing involves the tying together of several lower-cost minicomputers and terminals into a communications network rather than using one large computer.²¹ The demand for these distributed data processing systems is expected to increase at a rate of 30% annually.²⁰

This demand will enhance the growth of minicomputers which is already the fastest growing area in the industry. Shipments of minicomputers are expected to comprise one-third of all computer processor shipments and revenues from them should rise 25%.²⁰ Companies should diversify into these smaller lines because it would improve their ability to withstand an economic downturn.²⁰ The demand for all computer hardware should remain high, though, for several reasons. Hardware prices are currently low in relation to performance. Competitive forces and technological innovations should continue to hold prices down. Even if prices do rise, they will increase at a slower rate than the inflation rate which makes computers an attractive investment. Demand should also remain high because computers raise the productivity of labor and help the firm to counteract high personnel and raw materials costs.²⁰

Since prices of hardware are expected to remain low, companies will be relying more and more on sales of software to increase revenues. Software must be produced by skilled technicians, however, which will cause the industry to become more labor-intensive. Most

users will have to raise their numbers of computer personnel 7% to 8%.¹⁹ Leading makers are already spending half of their research and development on software which is more costly to produce due to the cost of skilled technicians.²⁰

Another new source of revenue for computer makers is the home computer market. Sales are expected to exceed \$300 million in 1980 and many firms (including IBM) are looking at the prospects in this market. These computers are used for education, information, house management, energy management and entertainment.¹⁸ Growth of this market will be slow, however, due to high prices (starting at \$600), lack of software, and difficulties in operating.¹⁹ Japanese manufacturers are expected to penetrate this market as well as increase competition in sales of all computers.¹⁹ Telecommunications will also be extremely important in the future because of the demand for distributed data processing systems. Thus, the areas computer manufacturers should concentrate on in the future are as follows: increasing software capabilities, offering telecommunications, and developing small systems.¹⁹ The industry as a whole should do well over the next two years because of the emphasis being placed on increasing productivity, the good balance sheet strengths of the companies, and the reduced time periods required for computers to pay for themselves in production savings.⁸

The Burrough Corporation

The Burroughs Corporation was incorporated in 1905 as Burroughs Adding Machine Company and adopted its present name in 1953.¹⁷ The firm is ranked second in mainframe computers and is a major producer of computers, business machines and office supplies.⁴ Forty-two percent of the firm's revenues come from its large and medium sized computers. Two of the large models (B7800 and B6800) can do on-line network management, integrated data base management, and simultaneous high-volume multiprocessing. The company's mid-range models (B4800, B3800, B2800, and upper range B1800) can serve as host computers or as regional computers in distributed data processing systems.²³ The company's base of installed systems is heavily oriented toward the mid-range systems and the firm has more small and mid-range systems than the industry average.¹⁹ Small systems (B80, B800 and lower range B1800) claim 21% of revenues and are used in multiprogramming and data communications. Other products and services offered by Burroughs are field engineering services, business forms and office supplies, peripherals, custom products and electronic components, and systems software.²³

In 1979, Burroughs had revenues of \$2.8 billion which was an

increase of 15%.³ Because of higher rental and service revenues and greater manufacturing efficiencies, Burroughs should have a per share earnings gain of 20% for 1979.²³ The firm claims approximately 6.4% of the computer market compared with IBM's share of 64%.¹ This figure illustrates IBM's total dominance of the computer manufacturing industry.

Burroughs' customer base includes a variety of users. The firm's Federal and Special Systems Group makes custom-built models for both commercial users and government users.²³ In 1978, the company received an \$11 million contract from the Air Force and a \$1.6 million contract from the Army.¹⁷ Military and civil government users constitute a large segment of the firm's customers. The company is also heavily oriented toward banking and service bureaus with 40% of its revenues coming from these sources.¹⁹ Foreign customers provide 42% of the firm's revenues and 37% of operating income.²⁴

Assets in Burroughs' foreign operations comprised 33% of the firm's total assets of \$2.6 billion in 1977.²³ Currently the firm is experiencing a lag in its overseas markets, however. Its Japan subsidiary controls 6% to 8% of that market but it has been unable to build up its business in the fast-growing European markets.⁴ This represents one of several competitive weaknesses Burroughs has. Many products which have produced steady growth in the past, especially medium to large systems, are now experiencing growing competitive pressures.⁴

Another weakness the firm has is in its software and maintenance services. The company should spend additional resources on expanding these areas.²³ In order to achieve the company's growth and profit goals, weak spots in product lines and software problems must be cleared up.⁴ Burroughs' market share of small business computers has dropped from 12% to 10.9% in the past four years. This could possibly be attributed to the corporation's philosophy that any lost market share can always be regained. The firm is hoping that the introduction of its B90 model will help change the trend in this market.⁴ In order to keep up with competition, Burroughs needs to expand into the areas of data communication, distributed data processing, and office automation. These areas are expected to be dominant throughout the 1980's.⁴ Management problems have plagued the firm and have kept Burroughs from moving into new areas. Due to the dictatorial management style of one of its former leaders, Ray MacDonald, the company has a shortage of senior management and lacks the creative management needed in this very innovative industry.⁴

Despite its weaknesses, Burroughs' net income has been rising steadily even during recessions. Its operating margins are second only to IBM's margins. While many firms in the industry, including IBM,

were showing lower profits for 1979, Burroughs had third quarter increases of 17% in revenues and 21% in net income.⁴ Its revenues for 1980 are expected to rise 15% and its margins are expected to increase due to higher volume production and lower interest expense.²³ Expenses associated with long-term debt were only 9% of Burroughs' costs for 1979.⁴

The company is dedicated to making profits and is aggressive in making strategies which account for much of the firm's success.⁴ Consumer and employee loyalty has also played a major role in making the company successful. In a 1971 survey of consumer loyalty, Burroughs ranked second with 79% of customers staying with the firm after their first order. IBM ranked first with 82% and NCR was third with 76%.² Thus, Burroughs has a very good reputation with its customers which is a prime measure of competitive strength in the computer industry. Burroughs also has the best record of employee loyalty in the industry even though employees are paid lower salaries and work long hours in modest facilities.⁴

With its present customer base, Burroughs has the momentum to keep on growing; however, with the changing market and IBM's growing aggressiveness, the firm may have to reformulate its strategy.⁴ The firm's current position corresponds to Quadrant 1 of the Boston Consulting Group Model. The firm has a strong competitive position in a rapidly growing market. According to the model, the most attractive alternative strategy for a firm in this position is one of concentration. Burroughs should concentrate its efforts on being more innovative in developing both hardware and software and on being more aggressive in marketing its products.

The top managers of the company have each influenced the firm's direction in various ways. Ray W. MacDonald is credited with having brought the firm from a business machines company to a successful computer manufacturing firm almost single-handedly.⁴ He dominated even the most minute everyday operations of the firm. He was a very charismatic leader who controlled all phases of the business and delegated very little responsibility to middle management.¹¹ Product planning and development were hindered somewhat since MacDonald did all of the firm's product planning when he was free from his other duties.⁴ The firm's "growth theory", which is still in effect, was started by MacDonald. This theory limits the company's growth to an annual rate of 15% which is presumably the maximum sustainable rate of growth.¹¹ MacDonald's management style was effective in bringing the company to the forefront of the computer industry but many of his methods have kept Burroughs out of high-growth areas. This is one problem that his successor, Paul S. Mirabito, tried to

change.⁴

Since his term as Chief Executive Officer came between two highly visible leaders, Mirabito's contributions are easily overlooked; however, he has made his mark on the company by encouraging management participation and delegating more responsibility to mid-management. One notable move he made was his appointment of a task force to make product recommendations. This should improve the company's planning and development of products immensely.⁴ Mirabito's goals for the firm are to double revenues in the next five years and to bring pretax margins closer to 25% (IBM's current level).⁴ Mirabito served as both Chairman of the Board and Chief Executive Officer but he wanted to be replaced by two men, one a seasoned executive (W. Michael Blumenthal) and one an operations man (Duray E. Strombeck). Strombeck is a young Burroughs career manager while Blumenthal is an internationally known figurehead.²⁵

The current Chairman of the Board, W. Michael Blumenthal, began his term in January 1980. His experiences have included being a Shanghai refugee, a deputy trade negotiator, a former Secretary of Treasury and a chief executive of the Bendix Corporation.²⁵ Although he knows nothing about computers, Blumenthal's expertise in hiring and motivating people and other duties of a top executive are expected to compensate for his lack of knowledge in this area.¹⁶ Blumenthal's style of management includes delegating responsibilities and staying out of everyday affairs. Burroughs' managers are not accustomed to this type of management which allows them to be more creative managers.⁴ Blumenthal should be a tremendous asset to Burroughs. As a former Secretary of Treasury, he is well known to the bankers who comprise a large percentage of Burroughs' customer base. As a former trade negotiator, his international reputation may help boost Burroughs' sagging foreign operations.²⁵

Burroughs' products are sold worldwide in over 120 countries. Its operations are divided into nine groups by products, markets, and locations. Four of the nine groups are marketing groups which are the Business Machines Group, the International Group, the Federal and Special Systems Group and the Office Products Group. The following five groups are manufacturing groups: the Computer Systems Group, the Small Systems Groups, the Terminal Systems Group, the Peripheral Products Group and the Components Group.¹⁷ Through these nine divisions, Burroughs effectively manufactures, markets and services its various product lines.

In the future, the company's management plans to maintain the 15% controlled growth rate while increasing its sales force and expanding its engineering and manufacturing facilities.¹⁷ However, some ana-

lysts predict that to continue its present growth rate the firm will have to move into another business line possibly through acquisition. Its pretax margin of 19% may also suffer because of IBM's marketing and pricing aggressiveness.²⁵ To be successful in the 1980's, Burroughs must develop its small computer systems more fully. Its currently unannounced 900 series is a step in this direction. The new series is expected to have a radical new design similar to IBM's new systems.⁴ The firm needs more product development than it has maintained in the past and an increased emphasis should be placed on this area in the future.

Regardless of economic conditions, Burroughs' revenues should rise in 1980 for several reasons. The introduction of new price and performance competitive small and medium systems, greater unit shipments, and an expansion of rental base equipment should lead to more income for the firm.²⁴ In the long run, the company's strong engineering and development organization, its efforts to increase its market share of mainframe systems, its expansion into minicomputers, and its increased emphasis on software development indicate that the firm's prospects are very good.²⁴

As a prospective employer, Burroughs has a lot to offer. In 1979, the firm employed 56,509 people which is an increase of 3% over the previous year.³ Burroughs offers careers in sales, marketing, programming, engineering, accounting and finance, and research and product development. The firm has the best record of employee loyalty in the industry.⁴ With the corporate objective of being the best in the data processing industry, Burroughs has a reputation for developing the individual employee to the best of his or her ability.⁹ When hiring, Burroughs looks for people with broad talent and potential rather than specialists. Employees work as part of small teams most of the time.⁵ The company builds its management from within the firm as a general rule and prefers to hire employees right out of school.⁴ In order to accomplish this objective, Burroughs has established extensive Cooperative Education Programs. Burroughs' use of Cooperative Education Programs began as early as 1911 and today over 250 students from 70 colleges and universities participate in the program.⁵ By using these programs the firm can try out students in an actual work situation before making a commitment to long-range employment.

Conclusion

The Bourroughs Corporation is listed as one of Fortune's 500 largest corporations. It ranks 123rd in sales, 44th in net income, and 26th in net income as a percentage of sales.⁵ It is a growing company in a

THE BATTLE OF MARATHON: ATHENS' MAGNIFICENT TRIUMPH

by Christopher E. Allen

On the morning of September 21, 490 B.C., an army of Athenian warriors marched onto the Plain of Marathon in southern Greece. They faced an invading military juggernaut that had swept virtually unimpeded across Asia, Africa, and into Eastern Europe. The Athenians were outnumbered ten to one by the massive invading force, a force that had never tasted defeat and that considered themselves invincible. However, in one miraculous, impossible stroke, the Athenians overcame the would-be conquerors from Persia at Marathon, forever halting the advance of Eastern culture into Europe and launching Athens into a glorious cultural genesis of its own; as Robert Silverberg quotes historian General J. F. C. Fuller in his analysis of Athens' incredible triumph: "Marathon endowed the victors with a faith in their destiny which was to endure for three centuries, during which Western culture was born. Marathon was the birth cry of Europe."¹

The significance of Marathon in shaping the future of man thus cannot be overestimated. The historical importance of the battle, however, merely serves to enhance the scope of Athens' triumph, not make it any more plausible; for one thing above all else is evident in even the most perfunctory analysis of the Battle of Marathon: Athens should never have defeated the vastly larger and infinitely more experienced Persian army. However, the Greek weaponry, superior to any the Persians had faced, the Athenian strategy, which defied the traditional tactics of ancient warfare, and, above all, the supreme confidence and individual courage of the Athenian warriors, unflinching in the face of crushing opposition, led them to victory over the despotic Empire of Persia.

The Persian Empire began to form about the seventh century B.C., when the three principal tribes of what is now Iran, the Lydians, the Medians, and the Persians, ceased warring among themselves and combined to conquer the outlying regions of the Mideast.² In the course of the next two centuries, the Persians conquered such military powers as Assyria and Babylonia, and controlled Phoenicia. With one rather insignificant exception, Persia, by the fifth century B.C., had conquered the known world.³

That insignificant exception was southern Europe, specifically the city-states of ancient Greece. These tiny cities posed no threat to Persia's vast empire, and thus were left to their own devices. This allowed one city-state in particular to develop its own form of government, a system unlike any the world had ever seen. The city-state was Athens; the political system was "democracy, ruled by the demos, the people."⁴

While the Athenians in southern Europe were prospering under this new government, however, the Greek colonists in Ionia were toiling under the tyrannical rule of the Persian Emperor Darius I. Ionia had fallen under Persian rule when the Persians had conquered Asia Minor, and the Ionian Greeks longed for the freedom enjoyed by Athens. In the spring of 498 B.C., the Ionians revolted against Persia and burned the holy city of Sardis.⁵ A Persian naval contingent quickly quashed the rebellion, but Darius was enraged at the audacity of the Ionians. What alarmed him most, however, was that the Greek city-states of Athens and Eretria had aided the rebels, and he vowed revenge on these interlopers.⁶ Silverberg quotes the historian Herodotus concerning Darius' reaction to the Ionian effrontery:

"Now when it was told to king Darius that Sardis had been taken and burned by the Athenians and the Ionians, he took small heed of the Ionians, well knowing who they were...but he asked who, and what manner of men, these Athenians were [for Athens had played a major role in the capture of Sardis]. And when he had been told, he called for his bow; and having taken it...he let an arrow fly toward heaven; and he said, 'Oh Supreme God! Grant me that I may avenge myself on the Athenians.' And when he had said this, he appointed one of his servants to say to him every day as he sat at meat, 'Sire, remember the Athenians.'" (p. 16).

Thus Darius began to mass his forces for an invasion of Greece. Before committing his armada to the operation, however, he dispatched heralds to all the Greek city-states, demanding their surrender. Only Sparta, the most powerful city-state, and Athens and Eretria, who had supported the Ionian revolt, refused.⁷ Mary Renault wrote that "In Athens and Sparta, the people were so enraged that they forgot all law and decency and killed the heralds."⁸ Thus the stage was set for one of the most inspiring dramas in the history of human conflict to unfold at Marathon.

Under the joint command of the general Datis and Darius' nephew Artaphrenes, a massive invasion fleet set sail from Tarsus on the

Cilician coast in 490 B.C. This armada struck first at Eretria.⁹ There is some dissent among scholars as to whether Artaphrenes struck at Eretria with the full invasion force or whether he took only part of the fleet while Datis sailed on to Marathon. At any rate, Artaphrenes was definitely in command of the siege of Eretria while Datis commanded the Marathon campaign.¹⁰

"In Eretria there was terror," writes Andrew Burn of the Persian assault. The Eretrians resisted the Persians' violent onslaught for six days before two of their own chieftains admitted the Persians to the city. Thus betrayed, Eretria was decimated by the Persian invaders, her temples burned to the ground in revenge for Sardis, and her gallant people led into Persian enslavement.¹¹ Flushed with the ease of their victory, the Persians sailed for Marathon, confident that they would deliver an equally devastating blow to the upstart Athenians.

On August 5, Datis beached his 600 warships in the Bay of Marathon.¹² The site had been chosen by Datis' advisor, the deposed Athenian tyrant Hippias, because its length (about six miles) and level ground accommodated Datis' greatest weapons, his archers and his cavalry.¹³

When word that the "Barbarous Medes"¹⁴ were massing at Marathon reached Athens, the Greeks rose to the challenge. Burn says the Athenians reacted swiftly: "Perhaps the army had concentrated on...the fall of Eretria; in any case, it moved fast."¹⁵ This alert reaction allowed the Athenians to reach Marathon and seal the two passages back to Athens before the Persians could advance inland.¹⁶

The Athenians were led by a council of war called the *strategoï*; it consisted of one general from each of the ten Athenian tribes, each elected annually and called archons, and a general in overall command called the *polemarch*. In 490 B.C., the *polemarch* was a noble named Callimachus.¹⁷

These warriors, courageous and determined though they were, still realized how overwhelmingly the odds favored the invaders. They appealed to the most powerful city-state in Greece, the warriors Spartans, for assistance. A religious scruple, however, prevented the Lacedaemonians from responding until the full moon had passed, and they arrived fully a day after the issue had been decided by Athens.¹⁸ Though news of the imminent arrival of Spartan troops may have forced the Persians to engage the Athenians earlier than they would have liked, the fact remains that the mightiest military power in ancient Greece missed participating in the greatest Greek triumph of antiquity by only a few hours.¹⁹

Just as the Athenians prepared to do battle alone, however, one ally dared to defy the awesome might of the Persian oppressors and stand

with Athens in her hour of need. Sir Edward S. Creasy describes the courage and loyalty of this tiny city-state called Plataea:

From one quarter only, and that a most unexpected one, did Athens receive aid at the moment of her great peril. . . . when it was noised over Greece that the Mede had come from the uttermost parts of the earth to destroy Athens, the brave Plataeans, unsolicited, marched with their whole force to assist the defense. . . .²⁰

Numerically, this reinforcement only amounted to about 1000 men; but their arrival probably boosted the morale of the Athenians considerably after Sparta left Athens to face the awesome Persians alone.²¹

Scholars tend to agree that the Athenian soldiers, called *hoplites*, could not have numbered more than 9000 men, plus the thousand Plataeans. The numerical disparity between their forces and those they were called on to defend was hopelessly apparent to the Athenian war council; estimates vary concerning the Persian strength at Marathon, but Creasy calculates the invading force at approximately 100,000, thus outnumbering the valiant Greek defenders ten-to-one.²²

For eight days the two armies confronted one another, the Greeks stalling in the hope that Sparta would arrive, the Persians unwilling to advance into the mountains where their archers and cavalry would be less effective.²³ Finally, on September 21, 490 B.C., the archon Miltiades initiated an attack plan he had devised, a desperate bid for victory made possible by a major Persian tactical error.

As the confrontation had dragged on without any action, Datis had advanced his force across the plain until they were within a mile of the Greek position. Miltiades saw this as an opportunity to strike the Persians a decisive blow. At dawn, he sent his entire army charging across the plain at the stunned Persians.²⁴

The success of Miltiades' plan depended on three things: 1) surprising the invaders so that their archers and cavalry could not devastate the approaching Greek line from a distance, 2) resisting the overwhelming Persian superiority at the thin center of the Greek line, and 3) defeating the Persians on the flanks and wheeling in to trap the Persian center. It was a daring, extremely perilous plan; miraculously, it worked.²⁵

The Persians were shocked; Herodotus wrote that when they saw the Athenians running at them "scanty in numbers, they thought them a set of madmen rushing to certain destruction."²⁶ The result of the charge, however, was that the Greeks escaped the Persian archers, who had little time to fire anyway, and the few volleys they could get

off failed to pierce the heavy bronze armor worn by the Greek hoplites.²⁷

The complete success of this initial phase of Miltiades' attack essentially sealed Persia's fate. Silverberg wrote of the Persian infantry: "The Persians had always relied on...the accuracy of their bowmen. They wore only light armor and wicker shields." (p. 20). In addition, the Persian cavalry was rendered useless; the aforementioned Persian advance had crossed a marsh in the center of the plain, and for some reason the horses had not been brought along. By a combination of chance and design, Persia's might had been stripped away. Suddenly, they were vulnerable.²⁸

The center of the Athenian line under the archons Aristides and Themistocles bore the brunt of the Persian attack. These two great generals slowly retreated throughout the day, hoping for the stronger flanks to break through and encircle the Persians. Just as the thin center had been pushed to the very edge of the plain, the Plataean flank on the right and Callimachus' Greeks on the left surged through their Persian foes and trapped the center regiments. In that fleeting instant, Athens won the Battle of Marathon. The trapped Persians were slaughtered; those few who could escape fled in panic to their ships, the Greeks in pursuit.²⁹ The Greeks lost Callimachus in this last effort, though they were able to capture seven Persian vessels before those Persians, who had once believed themselves invincible, fled the Plain of Marathon facing annihilation.³⁰

The Greeks had won a stirring victory, and they had won it decisively. The battle has since taken on an almost mythic quality; divine providence and other such mythical staples had little to do with the victory, however. The Athenians won through superior weaponry, strategic genius and raw courage.

The Greek weapons and armor were far superior to any Persia had faced. More importantly, Greek arms were designed specifically for close combat battles such as Marathon, while the Persians fought their battles from long range, and thus were unprepared to defend the Athenian weaponry. The heavy bronze armor of the Greeks rendered the chief Persian offensive weapons, the bow and a light 2¼-meter long spear, useless because those weapons could not reach the vital organs of the Greeks, which were well protected by armor and the great bronze shield called the *aspis*.³¹ On the other hand, the Persian silk tunics afforded little protection against the Athenian spears, one for throwing and one with a tip at each end for thrusting.³² The Persians were as incapable of sustaining a hand-to-hand battle as they were capable of decimating an enemy from a distance; exploiting this one advantage was the key to Miltiades' unique strategy, for Miltiades,

who had spent several years in Persia, was quite familiar with the strengths and weaknesses of Datis' invading host.³³

Miltiades' strategy succeeded against the superior Persian numbers because it defied battlefield logic of the time. Instead of massing his strongest forces at the center of his line, Miltiades thinned his center and strengthened his flanks. This tactic not only limited the area of battle, thus negating Persia's numerical advantage, but in fact carried the day for Athens, for when the flanks wheeled in upon the Persian center, the invaders had never encountered such a tactic and thus could not effectively combat it. Thus the Athenians were able to engage the Persians on Athenian terms at Marathon.³⁴

Perhaps Athens' most telling advantage, however, was their mental attitude; as Silverberg wrote: "The Athenians were fighting to defend their homes; the Persians were fighting simply for the glory of Darius. It was all the difference in the world, so far as morale went" (p. 21). Furthermore, the Athenians were defending their new democracy, their right to govern themselves. The Athenians had just overthrown one tyrant; their refusal to submit to another served them well in their clash with Persia.³⁵

Greek belief in myth and legend served to strengthen morale still further. The Athenian hoplites believed they were lead into battle by Theseus, greatest of their ancient kings.³⁶ The most famous legend of the battle, however, centers around the sacrifice of a lowly courier, and is a graphic illustration of Athens' determination to triumph at any cost. When Miltiades was assured of victory, he dispatched a runner to inform the city. The courier raced 26 miles to the Acropolis, gasped out his message, and died from exhaustion, so hard had he run. In his honor, the Greeks established an Olympic footrace of 26 miles. That race is still run today. It is called the Marathon.³⁷

Thus did Athens repel the mighty host of Persia. Their triumph was as total as it was incredible: 6400 Persians fell at Marathon; Athens lost only 192 men.³⁸ More importantly, the Persian facade of invincibility was torn away. The course of human history was forever changed at Marathon; the Eastern influence was expelled from Europe, and Western culture flowered into birth.

Athens displayed at Marathon the excellence of human courage and determination, and set a shining example of the greatness of human spirit in the face of even the most overwhelming adversity. The Athenians, by all odds, should have fallen at Marathon; as historian Walter Lord observes, however, there are no odds so great they cannot be overcome, as at Marathon, by humanity at its finest:

Every once in a while, "what must be" need not be at all.

Even against the greatest of odds, there is something in the human spirit - a magic blend of skill, faith and valor - that can lift men from certain defeat to incredible victory.³⁹

APPENDIX: The Legends of Marathon

The Athenians were great believers in divine assistance; Homer, for example, had Greek gods running all over the place in the Battle of Troy as recounted in *The Iliad*. The Greek hoplites at Marathon were no exception. Anne Ward, in *The Quest for Theseus*, writes that the Greeks believed Pan to have appeared, and another figure, a strange rustic brute, who "slaughtered many of the invaders with a plough." Andrew Burn identifies this mythical figure in his *Persia and the Greeks* as "the Echtylos, commemorating a man of rustic appearance and apparel, who struck down many of the barbarians with a ploughshare, and then could not be found after the battle" (p. 253).

The greatest hero to the Athenians, however, was Theseus. There is some argument today that Theseus and his exploits with the Minotaur and the Labyrinth are based on an actual Bronze Age king; regardless of whether he lived or not, however, he was beloved by the Athenians at the time of the battle as the king who had united all the Attic tribes to form Athens; his appearance at Marathon endeared him so to the Athenians that he became the patron hero of the city-state, a symbol of Athens at its finest. Anne Ward describes Theseus' development as an Athenian symbol in *The Quest for Theseus*.

Mary Renault, however, is the author most commonly associated with the Theseus legend through the two mythological novels, *The King Must Die* and *The Bull From The Sea*. In her nonfiction account of the Battle of Marathon, *The Lion in the Gateway*, she records Theseus' appearance at the battle:

Afterwards, when tales were told of the battle, men said that as the lines swayed to and fro, and the issue hung by a hair, in front of the Greek line appeared a mighty warrior, naked as a god, swinging in both hands an axe with a double head. He cheered them on to victory with a voice of bronze, and the Persians fell back in panic; when they had fled, he vanished into thin air. By his axe they knew he was Theseus, greatest of the ancient kings, risen from his tomb at his peoples' need. (p. 63).

This had a profound effect on the Athenians. Burn writes that when

monuments were raised to honor the fallen at Marathon, Theseus was also honored for rising to protect his people. (p. 255). Stelai, heavy marble slabs with the names of the dead by tribe, were raised on the tall burial mound which still stands nine meters above the plain; and beside them were erected monuments to Miltiades, source of the Greeks' strategy, and to Theseus, source of their inspiration.

Concerning the legend of the courier, there are some scholars who contend that an actual messenger named Pheidippides died after delivering his message to Athens. Other scholars recognize the authenticity of the courier Pheidippides, but contend that he was the courier who sought aid from Sparta, and the legend of the courier's sacrifice is just that - a legend. Whatever the actual truth may be, the story of the runner who sacrificed his life at Marathon in the name of the Greek cause remains a glorious example of the greatness of human spirit, a greatness personified by the Athenians and the Plataeans in their miraculous triumph at the Battle of Marathon.

END NOTES

¹15 *Battles that Changed the World* (New York: Putnam, 1963), p. 23.

²Silverberg, p. 14.

³Jack Cassin-Scott, *The Greek and Persian Wars 500-323 B.C.* (London: Osprey Publishing Ltd., 1977), p. 3.

⁴Silverberg, p. 15.

⁵Cassin-Scott, p. 3.

⁶Silverberg, p. 16.

⁷Silverberg, p. 17.

⁸*The Lion in the Gateway* (New York: Harper and Row, 1964), p. 31.

⁹Cassin-Scott, p. 5.

¹⁰Andrew Robert Burn, *Persia and the Greeks* (New York: St. Martin's Press, 1962), p. 238.

¹¹Pp. 237-238.

¹²Cassin-Scott, p. 5.

¹³Sir Edward S. Creasy, *The Fifteen Decisive Battles of the World* (New York: A. L. Burt Publishers, 1851), p. 34.

¹⁴Herodotus, *The History of Herodotus*, tr. George Rawlinson (Garden City, New York: Dial Press, Inc., 1928), p. 378.

¹⁵P. 242.

¹⁶Burn, p. 243.

¹⁷Creasy, p. 15.

¹⁸Creasy, p. 17.

¹⁹Burn, p. 253.

²⁰P. 17.

²¹Creasy, p. 17.

²²P. 18.

²³Herodotus, p. 343.

²⁴Burn, p. 248.

²⁵Burn, p. 249.

²⁶Silverberg, p. 20.

²⁷Cassin-Scott, p. 9.

- ²⁸Charles Hignett, *Xerxes' Invasion of Greece* (London: Oxford University Press, 1963), p. 66.
- ²⁹Silverberg, p. 21.
- ³⁰Silverberg, p. 21.
- ³¹Cassin-Scott, p. 34.
- ³²Renault, p. 59. An illustration of Greek armor and weaponry at Marathon can be found in Appendix A.
- ³³Creasy, p. 35.
- ³⁴Burn, p. 249.
- ³⁵Silverberg, p. 15.
- ³⁶Ann G. Ward, W. R. Connor, Ruth B. Edwards, and Simon Tidworth, *The Quest for Theseus* (New York: Praeger Publishers, 1970), p. 156. A more thorough examination of the myths concerning Theseus and other legendary characters and their roles in the battle can be found in Appendix B.
- ³⁷Renault, p. 54.
- ³⁸Hignett, p. 59.
- ³⁹Walter Lord, *Incredible Victory* (New York: Pocket Books, 1968), p. x.

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MELVILLE'S CREATION OF CAPTAIN VERE
AS PONTIUS PILATE IN *BILLY BUDD*

by Lanna G. Martin

One Melvillean scholar, Edward H. Rosenberry, states that of Melville's fifteen works, spanning the period from 1846-1924, only *Israel Potter* and *Billy Budd* are based on historical events and may properly be termed historical romances.¹ Such romances use atmospheres, famous people, or happenings of the past "as a vehicle for an imaginary tale, a tale which takes some of its credibility from the verisimilitude of recorded facts which remains free to adapt those facts to the primary aesthetic purposes of the author."² Another author, noting the importance of history in *Billy Budd*, says, "The historical circumstances touch on the story at every crisis but do not essentially determine it. We are fed both elements, the framing condition and the special action, as real and consequential"³ What Melville got from history was verisimilitude and motivation. Rosenberry explains that to achieve these two goals, "Melville did as much research as he had to and no more."⁴

For the history included in *Billy Budd*, Melville relied on two primary sources: William James's *Naval History of Great Britain* and Robert Southey's *Life of Nelson*.⁵ Several critics agree that "at some point in the developing conception of his plot, though not at the first as was once generally believed, Melville recalled and adapted to his purpose another chapter of naval history"—the notorious hanging in 1842 of three suspected mutineers by Captain Alexander Slidell Mackenzie on the United States brig *Somers*.⁶ This historical incident serves to give credibility to the story and to embellish the existing plot of Melville's moral level. *Billy Budd* is on the surface an historical romance, but the primary level is the moral story of the crucifixion wherein Captain Vere becomes Pilate.

Before discussing the striking similarities between Captain Vere and Pontius Pilate, it is necessary to examine Melville's construction and revision of *Billy Budd*. The Hayford and Sealts version of *Billy Budd*, published in 1962, "undoubtedly presents as faithful and reliable a text as is possible."⁷ Hayford and Sealts divide the development of *Billy Budd* into three stages, and, surprisingly, the first stage consisted of "Billy in the Darbies," the ballad at the end of the work, and a headnote which was written after the ballad.⁸ During Melville's

revisions of the initial phase, Melville changed Billy from an old seaman to a young, "spiritual innocent";⁹ in the second developmental phase, Melville introduced John Claggart, master-at-arms, and created a major focal shift.¹⁰ The false accusation uttered by Claggart about Billy was necessary to establish Billy's innocence, but this twist in the plot necessitated the addition of an arbitrator or judge. In the final stage, Melville introduced Captain Vere, as judge, and again, the focus shifted to the new character.¹¹ In a textual note, Hayford and Sealts explain the significance of the ascendancy of Vere in Melville's plot: "Throughout this phase (the third) the chief effect of this change was to transform Vere into a character whose importance equals—and according to some critics even surpasses—that of Billy and Claggart."¹² Also concerning the developing character of Vere, Rosenberry makes this statement: "Only at this stage, evidently, when the conception of the troubled captain had added a third dimension to his developing drama, did Melville begin to flesh out a historical scene, to paint the stage of time and place on which his tragic collision of moral forces could achieve human credibility."¹³

Billy Budd has been a "critical battleground" for many years.¹⁴ One reason for this state of disagreement among critics is that *Billy Budd*, like *Moby-Dick*, "is tinged with the white hue of nothingness."¹⁵ Some critics view *Billy Budd* as an "allegorical fable,"¹⁶ and since "the interpretation of such a work is a function of moral participation, commentary must be content to describe the text and elucidate the facts of the composition."¹⁷ The preceding approach seems plausible, but the problem with it is the character of Captain Vere; he, of the three major characters, is the "least obvious," because he is "neither pure white nor altogether black" as Billy and Claggart are.¹⁸ Because of this ambivalence, critics have written for and against Captain Vere. From 1921 to 1946 the common interpretation concerned not intention and tone as it does now but the interplay of characters. Toward the end of this period, critics began to concentrate on the character of Vere and to see him as a hero.¹⁹ After World War II, heated interpretational debate ensued; during the 1950's, the "ironist persuasion" of critics prevailed and treated Vere as a "reactionary authoritarian," not as a hero.²⁰ At the vortex of this warfare is Vere's decision to hang Billy. How one interprets the story depends solely on how he views Vere. One author suggests that "even more than in *Pierre* and quite as much as in *The Confidence-Man*, Melville was dependent on the quality of ambiguity for the effectiveness of his story."²¹

Since the ambiguity of Vere's character remains, critics realize that no one interpretation is the correct one. Although many views have been written, no critic, to the author's knowledge, seems to have

explored in depth the possibility that Melville created Vere as Pontius Pilate of the crucifixion story. Milton R. Stern, who edited a version of *Billy Budd, Sailor: An Inside Narrative*, assesses Vere's role in *Billy Budd* as follows: "Between these two views of human identity, between Christ and Satan, if you will, Melville places Captain Vere, a governor who must impose his power on society on the basis of which type most closely characterizes the world he governs."²² From the analytical studies of the development of *Billy Budd*, it seems apparent that Melville deliberately and painstakingly created Vere, and then, after the moral level of Billy Budd was obvious, he added the historical level to give credibility to the story as a whole. Several critics have stated that the parallels between Billy Budd and Christ and the symbolism on the morning of the execution in *Billy Budd* are "too numerous. . . to clear,"²³ and "too deliberate to be ignored."²⁴ But these critics stop far too short of the real parallels; Melville has created the crucifixion story in a naval setting in 1797.

In chapters six and seven, Melville introduces Captain Edward Fairfax ("Starry") Vere as being "allied to the higher nobility."²⁵ an experienced military man "mindful of the welfare of his men, but never tolerating an infraction of discipline," (p. 60) and biased toward "everything intellectual," (p. 62) and particularly biased toward "books treating of actual men and events no matter what era." (p. 62) Lewis Mumford, a well-known Melville critic, described Vere as "a man of superior order: humane, reserved, free from cant, fortified by an equal knowledge of men and books."²⁶ Evidently, Captain Vere is a successful man in his world on the water. Pilate, too, was a success by the world's standards:²⁷ he was of the equestrian rank (to be a member of this rank one either had to own "four hundred thousand sesterces in property" or had to have served in the cavalry).²⁸ Pilate rose to the top of civilian service; he was procurator of Judea (26-36) A.D.).²⁹ The procurator was the Roman authority in the provinces and had total control of the military and judicial administration; he heard cases and complaints.³⁰ Of Pilate's character, one authority says, "Too little is known of Pilate for any secure characterization to be attempted."³¹ Although Melville introduces Vere in chapters six and seven, the captain does not think or act until chapter eighteen, when Claggart accuses Billy of planned mutiny. This accusation brings the character of Vere to the front stage of the story. What is remembered about Captain Vere are his actions during the trial. Likewise, Pilate's memorable actions are those in the trial of Jesus. The fact that Vere's importance diminishes to nil is made clear by the newspaper account of the happenings aboard the *Bellipotent*; in the report, the captain is never even named. Shortly after the trial, Tiberius, the emperor,

summoned Pilate to Rome, but while Pilate was traveling, the emperor died, and "from that moment Pilate vanishes from history."³²

Melville's discarded title, *Billy Budd, Foretopman: What befell him in the year of the Great Mutiny*, shows the importance of the atmosphere to the story. Melville makes clear the fact that the incident on the *Bellipotent* was influenced by the mutinies which occurred earlier in 1797: "Discontent foreran the Two Mutinies, and more or less it lurkingly survived them." (p. 59) The air aboard the *Bellipotent* just prior to Billy's trial and death was, to say the least, tense. The trial of Jesus occurred on the day before the Passover,³³ and "the atmosphere in Jerusalem was always explosive; during the Passover it was sheer dynamite."³⁴ In both of these testy atmospheres, one party deeply hated another to the point of wanting him killed. Claggart despised Billy Budd because he was "the personification of health, beauty, and innocence,"³⁵ and wanted to have Billy killed, even though he was powerless to kill Billy himself. In the other setting, "the Jews from start to finish were seeking to use Pilate for their purposes. They could not kill Jesus themselves, so they were determined that the Romans would kill him for them."³⁶ Recasting the preceding quote points up intriguing parallels: (Claggart) from start to finish (was) seeking to use (Vere) for (his) purposes. (He) could not kill (Billy) (himself), so (he) was determined that (Vere) would kill (Billy) for (him)." The similarities between the relationships in *Billy Budd* and those during the trial of Jesus are too numerous to be accidental.

In Billy Budd's trial and in Jesus' trial the ultimate decision lay with Captain Vere and Pilate respectively, and in both instances, the judge disliked the accuser(s), felt and declared the accused to be innocent, was caught in a treacherous atmosphere, and made an expedient decision. Vere's dislike of Claggart primarily rested on intuition: "Something even in the official's (Claggart's) self-possessed and somewhat ostentatious manner in making his specifications strangely reminded him of a bandsman, a perjurous witness in a capital case before a court-martial." (p. 94) Rarely did Vere misread a person, because "something exceptional in the moral quality of Captain Vere made him in earnest encounter with a fellow man, a veritable touchstone of that man's essential nature." (p. 96) In the cabin when Claggart accuses Billy to his face, Billy is struck speechless because of a speech impediment. Vere attempts to comfort Billy, but "contrary to the effect intended, these words. . .prompted yet more violent efforts at utterance." (p. 99) During these efforts to speak, Billy's expression is "as a crucifixion to behold." (p. 99) In the next moment, Billy with one blow to the forehead strikes Claggart dead. Vere utters two statements which exhibit a preconceived idea about the guilt of Claggart

and the innocence of Billy: "It is the divine judgment of Ananias!" (p. 100) (Ananias was struck dead for lying to God. (Acts 5:4-5)) Vere's second statement is that Claggart is "struck dead by an angel of God! Yet the angel must hang!" (p. 101)

Quickly, Vere has the drumhead court summoned, even though its participants—the surgeon, the lieutenants, and the captain of the marines—feel that Billy should be confined "in a way dictated by usage" (p. 101) until the admiral can hear the unusual case. Vere has no choice within the law of the Mutiny Act, but he does have the choice of waiting for the admiral to hear the case.³⁷ Prompted by fears of the Nore Mutiny, Vere decides to hold the trial quickly and secretly. Melville suggests the influence of the atmosphere on Vere's decision to organize a court by saying, "For it was close on the heel of the suppressed insurrections, an aftertime very critical to naval authority, demanding from every English sea commander two qualities not readily interfusable (sic) prudence and rigor. Moreover, there was something crucial in this case." (pp. 102-3) Vere is exercising only rigor when he thinks that he is using prudence with a dash of rigor. As a result of Vere's exclamations and actions after Claggart's death and before Billy's trial, the surgeon questions Vere's sanity. Being "a loyal sea commander" (p. 103), Vere is not authorized to be like a civilian judge and to consider motive and right and wrong; he can judge only on the cold, hard basis of facts, "Budd's intent or non-intent is nothing to the purpose," says Vere. (p. 112) The captain is a very cool-headed, persuasive man in the trial, particularly in his speech to the coadjutors. Three times during the trial he says that he knows that Billy is innocent; twice Vere responds to Billy's testimony of innocence by saying, "I believe you, my man," and later to the judges, Vere says, "How can we adjudge to summary and shameful death a fellow creature innocent before God, and whom we feel to be so?" But Vere uses every talent in his persuasive power to sway the "Well-meaning men not intellectually mature" (p. 109) into deciding the case by martial, not natural, law. According to Vere, heart and private conscience have no place in a judge's decision. He attempts to ease their consciences by shifting the responsibility for their actions to the law: "Would it be so much we ourselves that would condemn as it would be martial law operating through us? For that law and the rigor of it, we are not responsible." (pp. 110-111) In addition, he says, "War looks but to the frontage, the appearance." (p. 112) Melville surmises, "But it is not improbable that even such of his words as were not without influence over them, less came home to them than his closing appeal to their instinct as sea officers." (p. 113) Billy Budd is formally convicted and sentenced to be hanged. Had the sentence not been given at night, the

execution would have taken place immediately as was customary. Although Vere calls himself a witness and not a judge, he is the judge, because he decides the case and sways the pawn-judges to his decision.

Primary source materials which contain information about Pilate's role in the trial of Jesus include Josephus and the Gospels: Matthew, Mark, Luke, and John. Each gospel contains the whole account of the trial, but each differs somewhat. In Jesus' trial, the Jews made the accusation about Jesus, the innocent man. (John 18:30) Pilate hated the Jews, and they knew it.³⁸ Josephus, a contemporary of Pilate, records three major conflicts between Pilate and the Jews which account for the ill feeling between them.³⁹ About this volatile situation another author states, "Pilate must have recognized at once that the accused man, Jesus, was the object of a hatred that had been stirred up by the Pharisees. That alone must have been sufficient reason for him to reject their demand and to acquit him"⁴⁰ But Pilate's decision was not that easy, because the Jews threatened to report Pilate to Rome for neglect of duty in releasing a rebel; according to John 19:12, the Jews shouted, "If thou let this man go, thou art not Caesar's friend." Historians point out that the atmosphere in Jerusalem at this time was at insurrection level. Realizing the intensity of the problem, Pilate wanted the Jewish officials to judge Jesus, but the Jews did not have *ius gladii*, the right of the sword, that the Romans did.⁴¹ Pilate next tried to release Jesus by custom; the Jews chose Barrabas, an insurrectionist. (Luke 23:16-19) According to *Clarke's Commentary*, a set of Biblical encyclopedias to which Melville probably had access, Pilate then tried to compromise: he had Jesus scourged and presented him as a broken man to the Jews while making an appeal to their pity.⁴² Pilate for the third time said, "I find no fault in him." (Luke 23:22) Pilate alone, like Vere in the case of Billy Budd, made the decision to execute Jesus. Succumbing to his fears of insurrection, Pilate, though feeling Jesus to be innocent, condemned him to be crucified—*Ibis ad cruceem*—which was always carried out swiftly.⁴³ But before the crucifixion took place, Pilate sought to "wash his hands" of the responsibility for the death of Jesus. (Matthew 27:24) Pilate's conduct during the trial was "well-nigh incomprehensible."⁴⁴

Some critics believe that Melville used *Clarke's Commentary* frequently for information about the Bible. Nathalia Wright, author of *Melville's Use of the Bible*, suggests that Melville relied on *Clarke's Commentary* during the writing of his novels.⁴⁵ The fact that Clarke's comments are so similar to Melville's Biblical allusion—particularly those in *Billy Budd*—supports the critics' belief. Furthermore, Melville's Captain Vere is remarkably like Clarke's summary of Pilate based on the Gospel accounts. For example, of John 19:8 Clarke says

that Pilate knew the accusation of the Jews to be false, that he could have released Jesus, and that Pilate feared that the Jews would complain to Caesar. (p. 616) Clarke goes on to say that like Vere, "Pilate was certainly to be pitied: he saw what was right, and he wished to do it; but he had not the sufficient firmness of mind." (p. 617) Concerning Pilate's knowledge of the innocence of Jesus discussed in Luke 23:22, Clarke states that Jesus was "in the *most formal* (textual emphasis) justified by his judge," and "that Christ died as an *innocent* person, not as a *malefactor*." (p. 463) Summarizing Pilate's behavior at the trial of Jesus, Clarke continues:

On the fullest conviction of his (Jesus') innocence, his judge pronounced him guiltless, after having patiently heard every thing that the inventive malice of these wicked men could allege against him; . . . (p. 463)

The above-mentioned qualities and actions of Pilate, as noted by Clarke, are easily seen in *Captian Vere*; such resemblances support the theory that Melville well may have written the moral level of *Billy Budd* using *Clarke's Commentary* as a research tool for background information and even for details.

Clearly, Vere and Pilate made expedient decisions which go against their moral beliefs, and both judges knew the true identities of the men whose lives they controlled. After Vere has told Billy of the verdict, the senior lieutenant sees Vere's face "for the moment one expressive of the agony of the strong. . . . That the condemned one suffered less than he who mainly had effected the condemnation was apparently indicated." (p. 115) Hillway, another Melville critic, points out the effect of Vere's role in the trial: "Having presided at the ritual, Vere never fully recovers from the horror of having had such a decision forced upon him."⁴⁶ On his deathbed, in a drugged state, Vere is heard by an attendant to murmur, "Billy Budd, Billy Budd." This attendant does not detect a sense of remorse, but when he repeats the murmurings to the member of the drumhead court who was the most reluctant to condemn Billy, the officer "too well knew, though here he kept the knowledge to himself, who Billy Budd was." (p. 129)

In the case of Pilate, when the Jews uttered that Jesus had claimed to be the Son of God, Pilate immediately suspected that Jesus truly was the Son of God. (John 19:7-8) In the judgment hall, Pilate asked Jesus, "Whence art thou?" and received no reply. (John 19:9) In the conversation which followed, Jesus told Pilate that Pilate's power against him was given from above, "and from thenceforth Pilate sought to release him." (John 19:12) But Pilate did not have the courage

to defy the Jews; he did, however, to their disliking, place a placard on the cross of Jesus which read, "Jesus of Nazareth, The King of the Jews." (John 19:19) Vere and Pilate condemned men they knew to be innocent before God to prevent insurrection and to maintain their jobs.

Many critics agree that Melville's crucifixion symbolism is particularly heavy in chapters 25, 26, 27, and 30. Reminding the reader of Jesus' words from the cross, Billy utters, "God bless Captain Vere!" (p. 123) Also in chapter 25 the vapory fleece is important; "The vapory Fleece hanging low in the East was shot through with a soft glory as of the fleece of the Lamb of God seen in mystical vision, . . . Billy ascended." (p. 124) In chapter 26, the Purser discusses in a conversation the phenomenal "absence of spasmodic movement" and hints that Billy's death is not totally human. (p. 125) The fleece lifts in chapter 27. But the most important symbolism is the linking of the spar from which Billy is hung to the cross: "To them (the bluejackets) a chip of it was as a piece of the Cross." (p. 131) This obvious symbolism caps off the moral level of the story; the crucifixion story of Billy Budd is complete.

The crucifixion story in which Captain Vere portrays Pontius Pilate is the main level of the story—the second level being the historical aspect which, according to the manuscript, developed later.⁴⁷ Of this moral level, one author says, ". . . it is simply a gospel, in which an order-threatening Christ is once again crucified by a conservative Pilate."⁴⁸ The parallels between Captain Vere and Pilate are many: both were forced to make expedient decisions which they abhorred because of insurrection-level atmospheres; both wished for alternatives to the execution of the innocent men; both appeared to be temporarily insane during the ordeal of the trials; both knew the true identity of their condemned men; both sought to shirk the responsibility for their actions; and both vanished from history after the trials. Melville in his carefully constructed character of Vere achieved not only ambiguity, which intrigues the critics, but also humanity, which attracts the reader. "Whether Vere is judged to be a martyr or a traitor to morality—and it does make a difference—he stands in all his excruciatingly human ambiguity as Melville's capstone achievement in fiction."⁴⁹

NOTES

¹Edward H. Rosenberry, *Melville* (London: Routledge and Kegan Paul, 1979), p. 101.

²Rosenberry, p. 101.

³Werner Berthoff, "The Example of Billy Budd," in *Twentieth Century Interpretations of "Billy Budd,"* ed. Howard P. Vincent (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971), p. 68.

⁴Rosenberry, p. 111.

⁵Rosenberry, p. 111.

⁶Rosenberry, pp. 111-112.

⁷Ray B. Browne, *Melville's Drive to Humanism* (Lafayette, Indiana: Purdue University Studies, 1971), p. 370.

⁸Herman Melville, *Billy Budd, Sailor: An Inside Narrative*, ed. Harrison Hayford and Merton M. Sealts, Jr. (Chicago: University of Chicago Press, 1962), p. 2.

⁹Rosenberry, p. 110.

¹⁰Hayford and Sealts, p. 2.

¹¹Hayford and Sealts, p. 2.

¹²Hayford and Sealts, p. 8.

¹³Rosenberry, p. 110.

¹⁴Rosenberry, p. 108.

¹⁵Paul Brodtkorb, Jr., "The White Hue of Nothingness," in *Twentieth Century Interpretations of "Billy Budd,"* ed. Howard P. Vincent (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971), p. 30.

¹⁶Brodtkorb, p. 30.

¹⁷Rosenberry, p. 109.

¹⁸Browne, p. 374.

¹⁹Hayford and Sealts, p. 26.

²⁰Hayford and Sealts, pp. 25-26.

²¹Rosenberry, p. 108.

²²Herman Melville, *Billy Budd, Sailor: An Inside Narrative*, ed. Milton R. Stern (Indianapolis: The Bobbs-Merrill Company, Inc., 1975), p. xxii.

²³William H. Shurr, *The Mystery of Iniquity: Melville as Poet, 1857-1891* (Ky.: The University Press of Kentucky, 1972), p. 256.

²⁴Ronald Charles Mason, *The Spirit Above the Dust: A Study of Herman Melville* (London: John Lehmann, 1951), p. 250.

²⁵Herman Melville, *Billy Budd, Sailor: An Inside Narrative*, ed. Harrison Hayford and Merton M. Sealts, Jr. (Chicago: University of Chicago Press, 1962), p. 60. All subsequent references to this source will be made parenthetically within the text.

²⁶Lewis Mumford, *Herman Melville* (New York: The Literary Guild of America, 1951), p. 354.

²⁷William Barclay, *The Gospel of John*, 3rd ed. (Philadelphia: The Westminster Press, 1975), II, 242.

²⁸Henry C. Boren, *Roman Society: A Social, Economic, and Cultural History* (Lexington, Massachusetts: D.C. Heath Company, 1971), p. 162.

²⁹Flavius Josephus, *The Complete Works of Flavius Josephus*, trans. William Whiston (no publisher and no date), p. 441.

³⁰Barclay, p. 238.

³¹Emory Stephens Bucke, ed. *The Interpreter's Dictionary of the Bible* (Nashville: Abingdon Press, 1962), III, 811.

³²Barclay, p. 248.

³³*The Bible, John 18-28*. All subsequent references to this source will be made within the text parenthetically.

³⁴Barclay, p. 243.

³⁵Mumford, p. 354.

³⁶Barclay, p. 234.

³⁷Charles A. Reich, "The Tragedy of Justice in *Billy Budd*," in *Twentieth Century Interpretations of "Billy Budd"*, ed. Howard P. Vincent (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971), p. 57.

³⁸Werner Keller, *The Bible as History*, trans. William Neil (New York: William Morrow and Company, 1956), p. 373.

³⁹Josephus, pp. 441, 443.

⁴⁰Keller, p. 373.

⁴¹Barclay, p. 233.

⁴²Adam Clarke, *The New Testament of our Lord and Savior Jesus Christ: The Text. Vol. V of Clarke's Commentary* (New York: B. Waugh and T. Mason for the Methodist-Episcopal Church at the Conference Office, 1833), p. 616. All subsequent references to this source will be made parenthetically within the text.

⁴³Barclay, p. 250.

⁴⁴Barclay, p. 236.

⁴⁵Nathalia Wright, *Melville's Use of the Bible*. (Durham, N.C.: Duke University Press, 1949), p. 13.

⁴⁶Tyrus Hillway, *Herman Melville* (New York: Twayne Publishers, Inc., 1963), p. 142.

⁴⁷Rosenberry, p. 111.

⁴⁸Alice Chandler, "The Name Symbolism of Captain Vere," *Nineteenth Century Fiction*, 22 (1961), 89.

⁴⁹Rosenberry, p. 113.

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EMERSON'S "URIEL" AND THE "DIVINITY SCHOOL ADDRESS"

by Barbara Boles

Ralph Waldo Emerson's address to the graduating class of Harvard Divinity School on July 15, 1838, sparked what Cleanth Brooks, R.W.B. Lewis, and Robert Penn Warren call "the angriest hornets' nest of his career."¹ Standing before the assembled graduates and ministers, Emerson had, after all, blatantly attacked Christian orthodoxy, including what he called Christianity's "exaggeration of the personal, the positive, the ritual," with its "noxious exaggeration about the person of Jesus."² Emerson quietly withdrew from the controversy which his address caused and which raged for some time after, but a collection of his poetry published in 1847 contains a particular piece, "Uriel," which most critics interpret in light of the "Divinity School Address." In his biography of Emerson, Ralph L. Rusk describes "Uriel" as a sublimation and poetic overstatement of the whole affair.³ There are other important interpretations, but if in fact the poem represents a sublimation of the controversy, then the address itself expresses a sublimation, or a culmination, of influences on Emerson's thought which had served to put him at odds with traditional, historical Christianity.

Certainly, one of these important influences was Emerson's loss of belief in the uniqueness of Christ's divinity, and his disillusionment with the Unitarian Church in general. Emerson's father had been a Unitarian minister, and Emerson, graduating from Harvard in 1826, was also a minister. Appointed pastor to the Second Church of Boston in 1829, Emerson remained there until his resignation in 1832. In his final speech to the congregation, Emerson explained his reason for leaving as an inability to perform with conviction the sacrament of the Last Supper, a rite Lewis Leary states he had come to feel was anachronistic.⁴ His reasons, however, went much deeper. Rusk points out that three years before the address at Harvard, Emerson had listed in his journal what he saw to be the defects of Christ. These included Christ's lack of humor and appreciation of art or science; Emerson had compared Christ to great men like Shakespeare and Socrates and found Christ wanting. Rusk quotes from that journal entry: "Do you ask me if I would rather resemble Jesus than any other man? If I should say Yes, I should suspect myself of superstition" (p.

267). On the basis of this (and other) journal entries, Rusk describes the "Divinity School Address" as the lecture Emerson "had unwittingly begun to write . . . years before he was invited to deliver it" (p. 267). The thoughts Emerson recorded in his journal by no means represent a resolution of his inner conflict. By the time he composed the address, Emerson had come to see Christ as a man and a prophet. In the address he described Christ as the one who "Alone in all history. . . estimated the true greatness of man," and who saw that "God incarnated himself in man, and evermore goes forth anew to take possession of his World" (p. 40). What Rusk points to in the journal, then, is merely evidence of Emerson's confusion, and, when put in context with the whole of his thought, reveals its evolution. Brooks, Lewis and Warren believe that Emerson's swing toward unorthodoxy was also due to the influence of the prominent, liberal, Unitarian minister William Ellery Channing, and that from Channing "Emerson learned the supremacy of direct intuition—especially of God as revealed in nature—over discursive reasoning" (p. 673).

Emerson, however, was not the only one who seized upon this notion of intuition; it was taken up by the Transcendental movement, centered in Boston, of which Emerson eventually became spokesman. Furthermore, the Transcendentalists believed, states Walter Harding, that man possesses an inner, spiritual element that is divine; they called it the oversoul.⁵ According to Leary, Emerson joined the Transcendental movement in 1836; assisted in organizing the Transcendental Club; helped edit the group's publication, the *Dial*; and hosted many of the club's meetings at his own home (p. 304). Brooks, Lewis and Warren described the club's members as generally young, liberal, Unitarian in background, and lacking any philosophic unity (a direct result of their intuitive certainty) save their idealism, rebelliousness and concern with man's intuitive and imaginative powers. These authors also see the Transcendentalists as embodying a religious movement, concerned with "God-in-nature" and rejecting the "cold pieties of contemporary Protestantism" (pp. 676-677). Emerson appropriated all these powerful ideas into his own maturing philosophy and from them came the basis for many of his essays, including the controversial thesis of the "Divinity School Address." It is interesting to note that, although Emerson's address is by far the more famous, about three months prior to Emerson's appearance before that illustrious group at Harvard, there appeared an article entitled "Thoughts on Unity, Progress, and Government" in *The Boston Quarterly*. Written by Rev. Samuel D. Robbins, a graduate of Cambridge's theology school and an organizer of Brook Farm, the article contained accusations against the church, namely, the alien-

ation of mankind from Christianity, asserting that "Individual minds are the best interpreters of the Divinity."⁶ This is the essence of Emerson's address, and, because of the similarity, Clarence Gohdes regards the "Divinity School Address" "as one of the concrete manifestations of a general attitude among the transcendentalists, and not as an extraordinary bit of spiritual pioneering" (p. 31).

While Emerson's involvement with Christianity and the Transcendental movement seems to have had the most significant impact on his thought,⁷ Brooks, Lewis and Warren speculate that his passionate love for the beautiful and sickly Ellen Tucker, who died less than two years after their marriage, may have been the factor precipitating Emerson's final break with orthodoxy. On the surface this seems an odd parallel to make. The authors justify their opinion in terms of Emerson's highly emotional reaction to Ellen's death. Apparently he visited her grave daily for many months and one night even reopened her coffin. They point out how very soon after this Emerson resigned his pastorate and denounced Communion as a misunderstanding by Paul (p. 673).

But how did Emerson express his ideas in the address at Harvard? The lecture opened with what Rusk describes as a "soothing description of the charm of nature. . . ." (p. 37). After a vivid account of the season, Emerson then stated that man cannot help but see the perfection in the surrounding natural world. According to Brooks, Lewis and Warren, Emerson managed to lure his audience from this shining vision of nature "to the realm of 'divine laws'" (p. 678). Emerson's exact words are: "But when the mind opens and reveals the laws which traverse the universe and makes things what they are, then shrinks the great world at once into a mere illustration and fable of this mind" (p. 37). These laws suggest, in Rusk's analysis, Emerson's affirmation of the Creator's existence (p. 268), and, in Emerson's words, it is from these laws man "learns that his being is without bound. . . ." (p. 37). The faculty through which man reaches this understanding is what Emerson called intuition. Thus, in the very opening of the "Divinity School Address," Emerson has rejected the necessity of a mediator between man and God, and has assigned to man a spiritual power unrecognized by Christianity. Furthermore, it is from the "great world," from nature, that man comes to truth. Emerson does more than imply that man is himself divine when he states, in words quoted earlier, that God incarnates himself in man, while in another statement he not only emphasizes the supremacy of intuition, he announces that it is the only way to truth: "Meantime, whilst the doors of the temple stand open, night and day, before everyman. . . it is guarded by one stern condition; this, namely: it is an intuition. It

cannot be received at second hand" (p. 39). Second hand meant, of course, the exaggeration and deification of Christ in which Emerson had long since ceased to believe. In the address he referred to the veneration of Christ as "the first defect of historical Christianity" (p. 40). He compared it to pagan religion in that Christ is made a demigod, "as the Orientals or the Greeks would describe Osiris or Apollo" (p. 40). The result of this, stated Emerson, was that Christianity had become formal and emotionless; it was these aspects of traditional worship that Emerson, along with the other Transcendentalists, rejected.

What Emerson called the first defect of organized religion led naturally to what he called the second defect—that is, the failure of the Church to recognize the divine in man. Speaking to the graduates and ministers, Emerson accused the Church of making God remote, of contributing to what has been called, according to Brooks, Lewis and Warren, "the death of God" (p. 678). Emerson also blamed the Church for purging nature from worship:

The faith should blend with the light of rising and of setting suns, with the flying cloud, the singing bird, and the breath of flowers. But now the priest's Sabbath has lost the splendor of nature; it is unlovely; we are glad when it is done; we can make, we do make, even sitting in our pews, a far better, holier, sweeter, for ourselves. (p. 42).

The "Divinity School Address" concluded with Emerson's characteristic and powerful challenge to the neophyte ministers to "dare to love God without mediator or veil" (p. 45), and to realize, as did Christ so long ago, that they are the Divine.

Before turning to the poem, it is necessary to mention another idea in the address, that of truth, because it is relevant to critics' interpretations of "Uriel." That Emerson believed wholeheartedly in his message is beyond doubt, but there is question as to what kind of reaction he may have expected. Rusk notes that prior to the address Emerson had attended a discussion on theism at Harvard, and, says Rusk, "there is room for doubt as to how ignorant they were of the nature of his discourse when he began to read it to them on that day" (p. 268). Although it is not clear whether Emerson really expected a warmer reception than he got, he did remark in the address: "But speak the truth, and all nature and all spirits help you with unexpected furtherance. Speak the truth, and all things alive or brute are vouchers, and the very roots of the grass underground there do seem to stir and move to bear you witness" (p. 38).

If Emerson did indeed expect this, it is certainly the opposite of what occurred. Within a month after the address was given, Andrews Norton, a professor of sacred literature at Harvard, attacked Emerson in an essay published by the *Boston Daily Advertiser*. In that rebuttal, quoted by Milton R. Konvitz, Norton blamed Emerson's address on a "restless craving for notoriety. . . ." He further declared that young people were turning away from religion, that they lacked sense, and held good taste in contempt. Opinions like these, he wrote, "attack principles which are the foundation of human society and human happiness" (p. 8). Norton wondered how Emerson could have ever been asked to Harvard in the first place, adding that the faculty had had nothing to do with it. Norton's outrage at what he perceived was a challenge to his dear beliefs rendered him incapable of seeing that the address was a plea, not to destroy Christianity, but to reinfuse it with the emotion and vigor many people felt it was losing. From the Transcendentalist point of view, if people were turning away from religion, it was because of problems within the Church itself. Norton did, however, note a contradiction in the address. In the closing statements Emerson had said, "I look for the new Teacher that shall follow so far those shining laws that he shall see them come full circle. . . ." (p. 47). How can this be, Norton asked, if all religious truth is intuited? (p. 9) There can be no certainty as to precisely who or what Emerson meant. Perhaps he realized that his own effort would not serve to change Christianity and he was thinking of the person who would. Soon after Norton's article, other religious leaders took up his sentiments; Emerson's name was linked with atheism and pantheism; the Transcendentalists were also attacked for their beliefs. Emerson's supporters—especially George Ripley and Theodore Parker—responded to the wave of criticism and a pamphlet war raged between the two sides. Emerson took no part in it. His second wife, Lidian, chronicled her husband's reaction in a letter to her sister (which Rusk quotes): "But you want to know how much of a cloud these mists of prejudice have formed over his light—Why, none at all. I do not know that he has felt a moment's uneasiness on his own account. . . ." (p. 270). January of 1839 Emerson delivered the last sermon of his career, and, despite the failure of the "Divinity School Address," determined to devote himself to writing and lecturing. He was not invited back to Harvard for over thirty years.

Critics, curious about Emerson's feelings concerning the uproar his address occasioned, have found satisfaction in the poem "Uriel." Robert Frost called "Uriel" "The greatest Western poem yet."⁹ Clearly, the theme of "Uriel" deals with the clash between old and new, tradition and change. It is this key idea that probably led critics

to assume the poem's relationship with the address, plus the fact that parallels can easily be drawn between figures in the poem and the Harvard personages. It is not difficult to see who should be cast in the role of Uriel; that the "stern old war-gods"¹⁰ represent the offended ministers headed by Norton; and that Uriel's lapse, during which he withdrew, is Emerson's own seclusion. All in all, this makes for a tidy analysis of the poem. Of course, it is only one level on which the poem may be interpreted.

Circles and lines are the central metaphors in "Uriel," probably representing the opposing philosophies. Uriel's sentiment, for example, is:

Against the being of a line.
'Line in nature is not found;
Unit and universe are round;
In vain produced, all rays return;
Evil will bless, and ice will burn.'

In his essay which is devoted to an analysis of line and round in the poem, Hugh Witemeyer explains line as representing Emerson's concept of Understanding, or man's rational faculties, and circle as Reason, man's intuitive process.¹¹ Uriel's assertion that "'Line in nature is not found'" simply means, says Witemeyer, that lines stand for man-made objects and philosophies, like "laws of form, and metre just" which Uriel has been discussing with the "young deities" (p. 100). Using Witemeyer's definition of line, then, Christianity, or any creed of philosophy for that matter, is in the realm of Understanding and not that of Reason, through which truth is discovered. The idea of round, or the circle, in the poem has several meanings. First, as symbolizing the realm of Reason, it stands for eternal and infinite truth. Uriel states, "Unit and universe are round;" this, claims Witemeyer, is significant because it means that no "arbitrary limits" can be imposed on thinking in a "fluid universe" (p. 99). Witemeyer's evaluation of line and circle in the poem is valid and illuminates the poem's meaning. In a "fluid universe" all things, such as good and evil, become relative. Hence,

The balance-beam of Fate was bent;
The bounds of good and ill were rent;
Strong Hades could not keep his own,
But all slid to confusion.

Likewise, statements in the address support this interpretation; for

example, "The soul knows no persons. It invites every man to expand to the full circle of the universe. . . ." (p. 40). Charles Malloy humorously explains the confusion Emerson's (or Uriel's) statements caused when he points out that it was the loosening of the bounds between good and evil that most upset Emerson's contemporaries who depended on a "vast property in the form of hells which they could only run by evil."¹²

On another level, Kenneth Walter Cameron sees the poem as possibly a hymn or memorial to Coleridge.¹³ Cameron believes that during Emerson's seclusion following the address, Coleridge's *Aids to Reflection* and *The Friend* comforted and inspired him in his decision to become a writer (p. 212). He also sees "Uriel" as Emerson's statement on "the progressive influence of the man of genius," from the appearance of the inspired individual whose wisdom is welcomed by the young but condemned by forces of authority and tradition, to his forced retirement or period of ignominy, to the eventual and inevitable triumph of truth (pp. 216-217). This explanation is quite literally a paraphrase of the poem.

F. O. Mattieson and E. T. Helmick see other meanings in "Uriel," namely, that the poem is Emerson's opinion on the role of a poet in society and on poetic theory.¹⁴ "Uriel" (says Helmick) fulfills the conditions which Emerson sees facing the poet in his quest for knowledge: a connection with the ancient poets and philosophers, a position apart from society, and a close relationship with nature" (p. 35). Helmick tends to reject "Uriel" as tidily corresponding to Emerson's essays or journals, preferring to dwell on the significance of the poem's Platonic conception of ideals — time and the poet's knowledge— and its mystical elements (p. 35). What was earlier mentioned as the clash between line and round illustrates, in Helmick's opinion, the theme of poetic creation, for it is the "Laws of form and metre just" that Seyd overhears the young gods discussing with Uriel. The medium through which Seyd reports what he has heard, the medium through which the poet reports truth, is language. Uriel, as Emerson's voice, pronounces against rigid laws of form, explaining why, according to Helmick, Emerson "subtly and consistently" varied the poem's meter, "a basic iambic tetrameter altered in nearly half the lines by an introductory trochee and in three couplets by feminine endings" (p. 36). The couplets rhyme perfectly, Helmick continues, until the period of confusion occurs in the poem, at which point they assume a certain dissonance, as in own/confusion, fell/Uriel, and god/cloud. As harmony is restored, the rhymes again become more exact.

"Uriel" is a complex poem open to varied levels of interpretation, but there is no doubt that Emerson saw himself in the angel's place.

The title itself comes from the Hebrew word meaning 'light of God' or the way through which knowledge of God comes to man.¹⁵ The last lines in particular seem to be Emerson's answer to the Harvard ministers:

Or out of the good of evil born,
Came Uriel's voice of cherub scorn,
And a blush tinged the upper sky,
And the gods shook, they knew not why.

A final question remains to be answered about "Uriel," about the "Divinity School Address," and about Emerson. Specifically, what relevance does Emerson hold for the modern world? What is his place in American literature? Reginald L. Cook poses the question thus:

In an era strenuously devoted to computer programming and automation, puzzled by overpopulation. . .preoccupied with missilery and rocketry. . .and the idolatry of science, what claims do Emerson's writings have on our attention?¹⁶

Certainly, the religious changes Emerson called for in the address are no closer to being accepted by mainstream Christianity than they were in 1838, and if "Uriel" is merely Emerson's poetic answer to a specific event in his life, have the two works lost their significance for modern readers? The answer here is no. Although Emerson's and his fellow Transcendentalists' religious views have been called a rejection of the coldness of Unitarianism, they are also a reaction against Christianity's basic emphasis on life after death, an emphasis which tends to ignore human potential in this life. In a lecture tour of this country in 1883, Matthew Arnold appraised Emerson by stating (as quoted by Konvitz) that

We have not in Emerson a great poet, a great writer, a great philosophy-maker. His relation to us is not that of one of those great personages; yet it is a relation of, I think, even superior importance. He is the friend and aider of those who would live in the spirit. (p. 72)

Clearly Arnold underestimated Emerson's capabilities as a writer; "Uriel" is poetry of a high order, containing a fundamental insight into human nature; still, it is in Arnold's final estimate that Emerson's precise worth and relevance are to be found. In the modern world, such as that described by Cook, in which the individual faces the

problems of isolation, disintegration, and depersonalization, Emerson's seemingly inexhaustible optimism in the power of the individual man and the divinity of his soul is, if not a cure-all for contemporary problems, at least psychologically therapeutic. And if Emerson sometimes sounds too naive and too confident, or if he seems to soar too high for modern sensibilities, perhaps it is because we have forgotten how to fly.

NOTES

¹*American Literature: The Makers and the Making* (New York: St. Martin's Press, 1973), I, p. 678.

²Emerson, "An Address," *The Complete Writings of Ralph Waldo Emerson* (New York: Wm. H. Wise, 1929), p. 40.

³*The Life of Ralph Waldo Emerson* (New York: Charles Scribner's Sons, 1949), p. 272.

⁴"Emerson, Ralph Waldo." *Encyclopedia Americana*, 1975 ed.

⁵"Transcendentalism," *Encyclopedia Americana*, 1975 ed.

⁶Clarence Gohdes, "Some Remarks on Emerson's *Divinity School Address*," *American Literature*, 1 (1929), 29-30.

⁷Emerson was also influenced by the philosophy of Plato and Montaigne. Brooks, Lewis and Warren see this influence in what they call "the two dimensions of Emerson, the idealistic and the down-to-earth, the searcher for the universal Moral Law and the observer of contemporary life and manners (p. 672).

⁸"On the Divinity School Address," *The Recognition of Ralph Waldo Emerson: Selected Criticism Since 1937*, ed. Milton R. Konvitz (Ann Arbor: Univ. of Michigan Press, 1972), p. 7.

⁹Brooks, Lewis and Warren, p. 750.

¹⁰Emerson, "Uriel," *The Complete Writings*, p. 840.

¹¹"Line' and 'Round' in Emerson's 'Uriel,'" *PMLA*, 82 (1967), 98.

¹²*A Study of Emerson's Major Poems*, ed. Kenneth Walter Camerson (Hartford: Transcendental Books, 1973), p. 36.

¹³"Coleridge and the Genesis of Emerson's 'Uriel.'" *Philological Quarterly*, 30 (1951), 214.

¹⁴F.O. Matthieson, *American Renaissance* (New York: Oxford Univ. Press, 1960), pp. 71-75; E.T. Helmick, "Emerson's 'Uriel' as Poetic Theory," *American Transcendental Quarterly*, No. 1 (1969), pp., 35-38.

¹⁵Witemeyer, p. 101.

¹⁶*Ralph Waldo Emerson: Selected Prose and Poetry*, ed. Reginald L. Cook (New York: Holt, Rinehart and Winston, 1969), p. v.

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"MARIE: A STUDY OF HER CHARACTER AND ROLE IN GEORG BÜCHNER'S WOYZEK."

by Hanne Karay

Woyzek is undoubtedly the main character in Buchner's drama, but just as fascinating is his beautiful mistress Marie, whose unfaithfulness shatters his world. We encounter Marie in the third scene. She is standing at the window with her little child, whose father is Woyzek, admiring a group of soldiers marching by. The focus of her attention is a splendid Drum Major (Tambour Major) who has also noticed her. Her neighbor Margret is also watching the parade and admiringly exclaims: "Was ein Mann, wie ein Baum!" And Marie adds: "Er steht auf seinen Füßen wie ein Löw!"¹ Marie is more impressed with his masculinity and his potential vitality which he is proudly displaying.

This episode is very suggestive. Marie is looking out her window. This suggests her inner restlessness or her dissatisfaction with her present state. She is waiting for something exciting to happen instead of playing the role of mother. The child, fathered by Woyzek, symbolizes a committed sin. And even while she is holding the child in her arms, she is already contemplating another lusty adventure which is evident in her comparison of the Drum Major to a lion. In this short scene we have gained already some insight into Marie. She admires the man for his sexual attractiveness and vitality. We sense the stirring of her desire.

Her neighbor Margret notices with interest that Marie has eyes for the Drum Major and she makes fun of Marie. Margret: "Thre Auge glänze ja noch—" . . . Marie lashes back at her, telling her that she should take her eyes to the pawnbroker to have them polished, and maybe they would shine enough to be used for buttons. Marie is saying that no one would look at Margret for her beauty and even if she could sell her eyes it would be doubtful that anyone would use them as buttons.

Marie is proud of her beauty and is delighted that she is desirable to men. But now it is her neighbor's turn to cut her down after having been insulted about her looks. "Was, Sie? Sie? Frau Jungfer! Ich bin eine honette Person, aber Sie, es weiss jeder, Sie guckt sieben Paar lederne Hosen durch!" Marie is furious. She slams the window in a rage. It is obvious that she is hot-tempered and although beautiful, she has to pay the price with other women for her beauty and reputation.

This scene depicts a sharp contrast to the previous two scenes with the cold-blooded, sterile doctor and the mechanical, lifeless captain who both symbolize the intellectual and traditional aspect of society.

As Marie slams the window tightly, she takes her little son and sings a tune:

Mädel, was fängst du jetzt an?
Hast ein klein Kind und keinen Mann!
Ei, was frag ich danach?
Sing ich die ganze Nacht
Heio, popeio, mei Bu, juchhe!
Gibt mir kein Mensch nix dazu.

The song underlines her loneliness and her predicament—"hast ein klein Kind und keinen Mann!" She sings the song as if to comfort herself and the child. David G. Richards comments: "The songs not only create atmosphere, but also provide comment on the action. More interestingly he adds: "By relating the experiences of Marie and Woyzek to the fundamental themes of folk songs, they also help to establish the play's universal validity."² The song then adds color and illustrates in another dimension her plight: she is all alone and no one helps her with her burden: "Gibt mir kein Mensch nix dazu." The reference to "Mensch" is significant since it encompasses a broader spectrum than just "Mann," the sexual description. She does **not** feel understood by either man or woman—not by a single soul. This is emphasized by the fact that when Woyzek comes and knocks at her window, he does not pay any attention to her but scares Marie with his mysterious and absentminded behavior: "Marie, es war wieder was, viel—steht nicht geschrieben: Und sieh, da ging ein Rauch vom Land, wie der Rauch Vom Ofen?"

It seems that he is referring to a verse in the Bible which looms like a dark omen over him: "Es ist hinter mir hergegangen bis vor die Stadt. Etwas, was wir nicht fassen, begreifen, was uns von den Sinnen bringt. Was soll das werden?" Marie: "Franz!" Marie is worried and scared. She does not understand Franz any more either: "Der Mann! So vergeistert. Er hat sein Kind nicht angesehen. Er schnappt noch über mit den Gedanken." Even the little boy looks frightened and this depressing atmosphere weighs so heavily on her that she says: "ich halt's nit aus; es schauert mich!" And she leaves.

In the next scene, Marie and Franz walk around at the fair and their interest is suddenly captivated by a showman whose wife wears pants and whose monkey is dressed in a costume. Marie is amazed over this spectacle and they both decide to go inside. As they step in the

Drum Major catches sight of Marie: "Was ein Weibsbild! Und zur Zucht von Tambour Majors!" The intention of the Drum Major is quite evident. This description of "Zucht" indicates the animalistic desire of the Major who simply admires Marie for mating purposes. The other officer is also admiring Marie: "Wie sie den Kopf trägt. Man meint das schwarze Haar musst sie abwärts ziehn wie ein Gewicht. Und Augen—" When exhibiting animals at a fair one might admire the way a horse or a fine animal might carry its head. Marie is being referred to in the same manner. He then insinuates that her dark hair is somewhat sinful and would pull her down from its weight. She is alluring to the men and the blackness of her hair, the apparent symbol of evil and sin, is intensified by the Major's comparison of her eyes. "Als ob man in ein' Ziehbrunnen oder zu einem Schornstein hinunterguckt." The blackness of her eyes is compared to the depth of a "Ziehbrunnen" or a "Schornstein" which leads our eyes far down into the bottom. This might possibly be the omen of Maria's future—her deep fall into sinfulness from which she cannot climb back up again.

Contrasting with the blackness of the inside of the Schornstein, the next scene opens up with a burst of light: Marie: "Was Licht!" and Woyzek replies: "Ja Marie, schwarze Katzen mit feurige Augen. Hei, was ein Abend!" He describes her as a black cat, the black again a sign of evil, and with "feurige Augen" Woyzek might associate her unconsciously with an animal looking for a prey.

The carnival scene is one of the crucial scenes of the drama. All three main characters are assembled here for the first time. The showman ridicules the professors and philosophers by pointing out how little animals differ from men and how even animals can be educated. He advises man to learn from animals and to be natural. The showman's words underscore the Drum Major's animal vitality and "naturalness." He has not come to see the show out of curiosity, but to feast his eyes on this splendid example of a woman—"Was ein Weibsbild!"

Marie knows of course that the Major is attracted by her sexual appeal and we find her in the following scene in her room, looking at herself in a mirror, while holding her child on her lap. She has pride in herself and her appearance and she knows that only her poverty prevents her from being courted like the fine ladies, for she is no less beautiful than they are:

Unsereins hat nur ein Eckchen in der Welt und ein Stückchen Spiegel, und doch hab ich einen so roten Mund als die grossen Madamen mit ihren Spiegeln von oben bis unten ihren schönen Herrn, die ihnen die Hand küssen. Ich bin

nur ein arm Weibsbild.

Like Woyzek she sees money as the determinant of one's social position, attitudes and behavior. The poor make less of an effort to idealize their natural or animalistic drives by pretending they are something other than what they really are; they do not disguise them behind euphemisms or behind the artificial masks of elaborately refined conventions, rites and formalities.

The image of Marie's red mouth suggests the forbidden fruit, the red apple in the garden of Eden and thus sinfulness. Marie steps in and as if caught in an unlawful act she jumps up and reaches to her ears. Woyzek immediately gets suspicious when he sees the earrings which she is trying to conceal. He does not believe her when she tells him that she found the jewels. Woyzek: "Ich hab so noch nix gefunden, zwei auf einmal!" Marie: "Bin ich ein Mensch?" Is she not a human being? Can she not wear two earrings? Again she uses the word "Mensch" and again this scene repeats the usage of a folksong which Marie is singing while she looks at herself in the looking glass:

Mädel, mach's Ladel Zu,
s'kommt e Zigeunerbu,
Führt dich an deiner Hand
Fort ins Zigeunerland.

The folksong colorfully pictures how Marie interprets her present situation; it also lets the spectator know what is happening to her inwardly as well as outwardly. It is a very simple matter: a young gypsy passes by, she closes her door and he takes her by the hand to gypsyland. She is closing the door to Woyzek. She is also changing allegiance. Her loyalty will shift to the gypsy and his country. We know that gypsies (Zigeuner) are nomads, who move from place to place and really nowhere have a settled home. But Marie in a romantic way wants to feel protected, "führt dich an deiner Hand" and she more or less lulls herself into this illusion of safety mingled with excitement. The gypsy image might possibly indicate how restless and rootless she really feels; it would suggest that she too with her illegitimate child feels like a social outcast, that is, like a gypsy.

The child appears as the symbol of her sin again and she feels guilty: "Still Bub, die Augen zu! Das Schlafengelchen! Wie's an der Wand läuft." Sie blinkt mit dem Glas: "Die Auge zu oder es sieht dir hinein dass du blind wirst!" She wants to protect the child. He is as innocent as an angel when he is sleeping. As she blinks with the mirror she tells the child to close the eyes or "it" will blind you. What will blind the

child—the truth behind mankind? The truth that man is full of evil and sin that it even frightens her? The mirror image could be a vehicle to reflect the soul and that it might show something so terrible that it will hurt when seen.

This passage also brings to mind the story of Snow White and the Seven Dwarfs. The beautiful queen looked every day into the mirror to see if she was still the most beautiful woman in the country—but she was evil too.

Marie is beautiful too but she also feels evil inside for she is struggling with her conscience. Should she be faithful to Woyzek or give in to her desire to follow her Troubadour. To be faithful would be a sign that she is of higher moral standing; and she knows that she is so frustrated that she cannot help herself. Nature ("die Natur") forces her to mate with the Drum Major in the same manner that nature compelled Woyzek to urinate against the wall. Her lower instincts are stronger and win: "Geht doch alles zum Teufel, Mann und Weib." Marie, torn between church and nature, feels terrible guilt by submitting herself to her drives and for this reason she is such a tragic figure. Although she knows that she is sinning she is incapable of choosing to stay with Woyzek. Her misery and conflict cries out: "Ich bin doch ein schlecht Mensch. Ich konnt mich erstechen!" There is ominous reference to the knife which we know will be the instrument of her death. The foreshadows of the crime loom dark and heavy over this scene.

While in the subsequent scene Woyzek stoically undergoes the systematic humiliation and degradation of the doctor in order to earn a little extra money for Marie, she is preoccupied with the Drum Major in her room. The scene is short; both partners know exactly what they are after and neither wastes much time with formalities or conventional customs. Marie is impressed with the Drum Major's strength and build and his underlying vitality. She looks him over as a farmer would an animal at the stockyard. Their actions resemble rituals of mating animals with certain basic patters—the strutting around of both partners, the sizing up of one another, the proud self display of Marie and the Major. "Ich bin stolz vor allen Weibern" and the Drum Major brags: "Wenn ich am Sonntag erst den grossen Federbusch hab und die weiss Handschuh, Donnerwetter, der Prinz sagt immer: 'Mensch, es ist ein Kerl!'"

This particular passage is very revealing and could be interpreted in several ways. The mentioning of the "Federbusch" brings to mind the colorful tail of a rooster or peacock which these animals also use to attract female partners for mating purposes. The references to white gloves and the prince also suggest that the Drum Major wants to elevate himself socially before Marie and therefore make his action

more acceptable socially. He wants to cover up and dress up his lower instincts with pretty clothes to make them less apparent. The clean white gloves could also possibly mean a symbol of innocence and elegance in addition to the more likely symbol of covering up a deed. One is reminded of Lady Macbeth, whose hands revealed her guilt. There is good reason to assume that Büchner intentionally used the white gloves as a vehicle to convey the idea of the concealed sin or hidden guilt.

Then, for a second only, Marie pretends not to be all that impressed by his words. But her desire pushes forward and she exclaims: "Mann!" as if to say "What a splendid sample of the human species you are!" However, when he passionately proposes to leave a brood of Drum Majors (Sapperment! Wollen wir eine Zucht von Tambour Majors anlegen, He?) her mood shifts suddenly, her face clouds up as if bothered by something and she pushes him away from her. "Lass mich!" With the mentioning of the brood she thinks of her child, who is the symbol of her guilt. Now she is about to sin again, this time against Franz and the church, since she considers Woyzek her husband. Whatever her doubts, they are wiped away when the Drum Major stirs up her innermost desires and passions. "Wild Tier" "Rühr mich an!" she replies, passionately aroused. Then before she finally submits sexually and mentally, she is asked: "Sieht Dir der Teufel aus den Augen?" And Marie replies with a resignation that points to the conclusion that she is completely helpless in the course of happening events. "Meinetwegen—es is alles eins." She cannot help her fate.

In the meantime Woyzek is rushing home to see Marie when he runs into the Doctor and the Captain (Hauptmann) on the street. The Captain hints quite strongly that Woyzek's mistress had been unfaithful to him and has betrayed him with the Drum Major. Woyzek, pale, in the next scene steps into Marie's room. He stares at her in an effort to find an outward sign of guilt or sin. "Eine Sünde, so dick und so breit—es stinkt, dass man die Engelchen zum Himmel hinausräuchern konnt! Du hast einen roten Mund, Marie, du bist schön wie die Sünde—kann die Todsünde so schön sein?" Woyzek refers to her red lips—the symbol of beauty, but also of sinfulness, like the beautiful and delicious forbidden fruit in the garden of Eden. Is there no blemish on her lips? Should there not be a mark of her unfaithfulness, her sin? "Wie Marie, du bist schön wie die Sünde—kann die Todessünde so schön sein?" The reference to "Todessünde" (mortal sin) brings with it the idea of death. Vengeance is on Woyzek's mind. His decision to kill her grows out of the language he uses at this point. Marie is frightened: "Franz, du redst im Fieber!" She does not know this but is actually quite accurate. His mind is already breaking. Marie was all Woyzek

had, and from the time that the Captain mercilessly told him about her betrayal, we actually see Woyzek's mind deteriorate in a systematic way to the point of self-destruction. Marie with the act of her unfaithfulness is really the one who has given him the final blow—she has stabbed him in the back before Woyzek stabs her. Marie refers to the knife, possibly planting in Woyzek's mind a seed which will grow: "Rühr mich nicht an, Franz! Ich hätt lieber ein Messer in den Leib als deine Hand auf meiner."

It is significant that Woyzek exclaims "Mensch" before Marie shouts back "Rühr mich nicht an!" Let us recall that in Marie's room the Drum Major calls her a wild animal and she passionately invites him to touch her. Woyzek is looking for the human qualities in her. He cannot believe that she could be so obsessed by her sexual desire, her lowest animalistic instinct, that she would betray him for that. He saw value in her beyond sexual pleasure and he even underwent the humiliation of serving as a guinea pig for the doctors, in order to earn a little extra money for Marie and the child. He cared for her. He stoops to sell himself so that she could have food and clothing, while she sells herself for some glittering earrings and the satisfaction of her fulfilled sexual needs. Woyzek can bear all of the humiliation and degradation of the Captain and the Doctor, but that his mistress would betray him is more than he can endure.

Woyzek leaves Marie's room and drifts around the village, his mind restless and diffused. He goes to the Inn (Gasthaus) later where he sees Marie and the Drum Major dancing without noticing him. As he watches, Andre sings a little folksong which uses the hunting image to colorfully underline the sequence of events and its implications.

Ein Jäger aus der Pfalz
Ritt einst durch den grünen Wald
Halli, hallo, ha lustig ist die Jägerei
Allhier auf grüner Heid
Das Jagen ist mein Freud.

The image of the hunter and the hunt could be applied to all three characters—Marie, the Drum Major, and Woyzek. They are a triangle of hunters searching out their prey. Marie is on the hunt for a new lover; so is the Drum Major. Woyzek now becomes a hunter; his prey is Marie. The hunt imagery unites the spheres of the animal and human, important categories throughout the play.

As Marie and her partner are dancing Woyzek overhears her humming—"Go on, go on, go on!" This causes his mind to snap altogether. He throws up his hands in the air in a desperate gesture. He

cannot believe that Marie is so lowly and can only think of her sexual desires as the lowliest creatures on earth, like a dog in heat. "Dreht Euch, wälzt Euch! Warum bläst Gott nicht die Sonn aus dass alles in Unzucht sich ubereinander wälzt, Mann und Weib, Mensch und Vieh! Tut's am hellen Tag, tut's einem auf den Händen wie die Mücken! Weib! Das Weib is heiss, heiss! Immer zu, immer zu!" He jumps up "Der Kerl, wie er an ihr herumgreift, an ihrem Leib. Er, er hat sie—wie ich am Anfang." then Woyzek collapses. For Woyzek, seeing the truth—that man can be so evil and sinful—is more than he can bear.

The last time, the three characters were together in the carnival scene. There Marie was still bonded to Woyzek. Now the picture is reversed. He looks on, just as the Major had looked before, and this time Marie and the Drum Major are coupled. She was the last and only person that had meant something to him. He sees with his own eyes that he has lost her.

Marie in her room is troubled by guilt feelings. She reads in the Bible to find consolation. The sight of her child provokes pain in her: "Das Kind gibt mir einen Stich ins Herz." Büchner draws attention again to Woyzek's plan to kill her as she feels a stabbing pain in the heart. The child reminds her of her recent unfaithfulness. She feels like an adulteress although Woyzek and Marie were never formally married in the church. Nevertheless she feels a bond and obligation to him and considers him her husband.

Meanwhile Woyzek has bought a knife from a Jew and gets his personal belongings in order in the barracks.

Marie is standing in front of her house with several children. One child sings a song:

Wie scheint die Sonn am Lichtmesstag
Und steht das Korn im Blühn.
Sie gingen wohl zur Wiese hin
Sie gingen zu zwein zu zwein.
Die Pfeifer gingen voran
Die Geiger hinterdrein
Sie hatten rote Socken an

It is a bright sunny day; the corn is blooming. Some couples went down to the meadow, the flute player leading and the fiddle following the group, and they were wearing red socks! We have come across Marie's red mouth before symbolizing beauty mingled with sin. Büchner also describes Marie's lust, "heisse Schenkel" and the "heisse Weib" in the scene where Woyzek breaks down over the fatal discovery of her unfaithfulness. It follows that lust is associated with red as

beautiful and sinfull at the same time. The color red also connects easily with the color of blood and assumes here a kind of fateful overtone.

The children want Marie to join in the song, but she is depressed. The grandmother then tells a story which is even more depressing. She tells about a child who is all alone and looks everywhere in the universe to find someone. But everything is dead—the world, the moon, the sun, the people.

The poor orphan in the grandmother's tale is analogous to Woyzek and his child. Having lost its father and mother the child looks all over the earth for human companionship, but everything is dead. The child extends its search for life into the universe, only to discover that the moon is nothing but a piece of rotten wood; the sun, a dead sunflower; and the stars dead insects stuck on twigs. Upon its return to earth it finds that the earth has become an overturned chamberpot. "Und da hat sich's hingesetzt und geweint, und da sitzt es noch und is ganz allein."

Büchner employs the form and conventions of the fairy tale to express hyperbolically one of the basic motifs of the play and of his works as a whole: in its isolation and loneliness the child represents not only Woyzek and Woyzek's child but also man in general. The fairy tale contributes significantly to the mood of the play and the intensification of its dramatic impact.

Where normally a stunned silence should linger, Woyzek cuts in and takes Marie with him to the woods near a pond. He asks how long they have known one another. She answered: "Am Pfingsten, zwei Jahr." It should be noted that the mentioning of a church holiday signifies a bond to the church and the "zwei Jahr" the bond to Woyzek. He asks "Friert's dich, Marie? Und doch bist du warm. Was du heisse Lippen hast." Her hot lips referring to beauty and sin again, "und doch möcht ich den Himmel geben, sie noch einmal zu küssen." But he cannot even bring himself to kiss her.

Woyzek: "Du wirst vom Morgentau nicht frieren." Marie: "Was sagst du?" Woyzek: "Nix!" No communication between the two exists anymore. Marie's next words symbolize this inner separation by talking about the moon out in the universe. Marie: "Wie der Mond rot aufgeht." Woyzek brings Marie's attention—and ours—back to earth and to his hand, in which he holds the knife. Woyzek already sees the knife dripping with blood. He then stabs her several times. "Ha, sie zuckt noch"—as an animal makes a last jerk before death sets in and the limbs stiffen and then "—bist du tot? Tot! Tot!" "Tot" rhymes with "rot" which we attributed with beauty and sin, and the fact that Büchner repeats "tot" three times could support the idea that he wants

to make sure this animalistic sin is wiped out.

Woyzek runs back to the inn where people notice blood on him and in panic he races back to the forest. He thinks he hears something, but everything is quiet. Frantically he looks for the knife, then looks for signs of blood on his body. There a spot—and there another—the Shakespearean influence undeniable—and then we assume that he drowns himself.

Woyzek's obsession with the color red deserves close attention. As he looks at Marie's corpse the blood around her neck appears like a necklace to his distorted mind. Once again he associated red with sin and perhaps also with the gift Marie received from the Drum Major: "Bei wem hast du das Halsband verdient mit deinen Sünden?" Marie's sin exacts as retribution the very vitality that was its cause. "Hab ich dich gebleicht?" Blood, beauty, suffering, and sin are all connected through the color red, and Marie loses them all when Woyzek sheds her blood and makes her pale. But in assuming the role of judge and executioner, Woyzek becomes bloody and guilty himself.

Marie is a troubled character in this drama. She has been raised in the Christian faith and suffers guilt feelings for having betrayed Woyzek. She feels a loyalty to him like a wife, but Woyzek does not pay attention to her and she looks for sexual gratification elsewhere. From these two forces, her Christian beliefs and the urge of her natural sexual instincts, the conflict arises. Marie is actually a greater tragic figure than Woyzek precisely because of her inner conflict and fight, which Woyzek does not suffer from. In the end it is Marie, though, Woyzek's social equal, the woman who means everything to him, who causes his destruction—not the doctor, not the Captain, as cruel and unfeeling as they are to him. Marie is the one who kills him, because she represents his last belief in humanity. When she lets her animalistic instincts rule her mind, she destroys Woyzek's world. Just as she feels compelled to leave him for the Drum Major, Woyzek feels compelled and driven to kill her to erase the evil which shatters his world. And of course by killing her he brings about his own death, too.

NOTES

¹All quotations from Buchner's drama are from the text as produced in *Das Deutsche Drama von Kleist bis Hauptmann*, A. Peter Foulkes and Edgar Lohner, eds. Boston: Houghton Mifflin Company, 1973.

²Richards, *David Gleyre, Georg Buchner and the Birth of the Modern Drama*. Albany: State University of New York Press, 1977, p. 194.

It must have been a very long time ago... [Illegible text]

It was a long time ago with the same old feelings... [Illegible text]

He had a long time ago... [Illegible text]

APPENDIX

References to the... [Illegible text]

References to the... [Illegible text]