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A Curriculum Resource Text for the Alcohol Unit in Public and Private Schools

Lester A. Wetzstein

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A CURRICULUM RESOURCE TEXT FOR THE ALCOHOL UNIT
IN PUBLIC AND PRIVATE SCHOOLS

A Dissertation
Presented to
the Faculty of
Western Evangelical Seminary

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Ministry

by
Lester A. Wetzstein

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ALCOHOL UNIT IN PUBLIC AND PRIVATE SCHOOLS

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CHAPTER ONE

INTRODUCTION

The absolute worth of a human life and the social order in which that life finds identity and expression provide the base for an initiative to pursue the development of life's highest potential with assurance in the future that coming generations may expect the same opportunity. The manifold evidences graphically documented relative to man's inhumanity to man in our present age clearly invoke a spirit of urgency for realistic solutions now and not some far distant time.

The recurring incidents that reveal the fact of many who profit from human suffering and pain cry out for justice and restitution. Too many of the agencies and departments of civil, social, administrative, legislative, judicial, and criminal justice divisions of government are rendered ineffective and sometimes, inept, through confusion and the occasional motivation for self-perpetuation that characterizes mediocrity and bureaucratic laziness.

The need for deliberate action is now. This study sought to throw light and corrective therapy on an educational process that is fundamental to the exercise of life in the present with hope for the future.

Justification of Study

It is a statistically verified and experientially certified fact that millions of Americans are enduring indescribable pain in the alcoholic syndrome. There is no guarantee present now or anticipated in the near future that the present trend will be effectively lowered or eliminated.

Every person has a constitutional and human right to health and safety in his person and home along with all the benefits concurrent with those rights.

Wherein there is much confusion in the terminology associated with the drug culture, currently, the need for clarification and honesty is imperative. For the benefit of the young and fertile minds of our future generations, there is need, now, for truth and integrity in our educational curriculum.

With so few voices raised for the positive merits of health and safety in the social order, a better understanding and total comprehension of a very complex syndrome that afflicts millions of citizens in human suffering is justified.

There is need to seek relief from the media acclaimed conflicts of interest exposed in the legal and industrial segments of our corporate life.

Thus, the study was an exercise in preparing a document based on drug effect that may serve to reverse and heal the sufferings noted, rather than promote a philosophy of consumption that perpetuates the suffering.

Method of Procedure

The study was directed toward the development of a document to serve as a resource text for the public and private school teacher. Fresh, new, and innovative procedures keep the search for truth, solutions to persistent problems, and understanding alive.

There are vast resources available for utilization in the educational forum. This study utilized the research and knowledge of noted scientists in their fields of bio-chemistry and pathology to strengthen the basic offerings of curriculum content.

In addition, the study called upon the native capacity of each person to seek a more comprehensive and utilitarian understanding of life with speedy solutions for its problems.

Limitations of Study

The study was, first, a positive presentation of the effects of ethanol on the structure and function of the human body ranging from the first drink to the lethal dose.

By the very nature of the complex dimensions of addiction, the study was not a guide for rehabilitation professionals. It was the hope of the author that the context may serve to enlighten the lay student because it was limited to basic concepts of health and safety.

Also, the study proposed to prioritize the validity of primary prevention in preference to the heralded accomplishments of rehabilitation which manifests minimal interest in the elementary causes of addiction.

Design of Study

It was the design of the study to permit the character and nature of the drug, the structure and function of the human body, and the role of alcohol in the social order to dictate the selection and flow of the textual content.

Chapter Two reviewed the origin and physical properties of ethanol in natural science. The physiological characteristics of the human body were presented in Chapter Three.

Chapter Four, the predominant core of the study, enumerated the effects of alcohol on the structure and function of organs and systems comprising the human body. It was more illustrative than exhaustive.

Chapter Five was dedicated to alcohol and society with three aspects, sociological, family living, and traffic safety, specifically noted.

Two areas of alcohol's effects on human behavior were noted in Chapter Six: psychology and ethics. Chapter Seven was given to evaluation of the close interrelationship between citizenship and legislation.

The conclusions of the study in Chapter Eight were presented by the priority merit conceptualized in primary prevention by contrasting the alternatives in rehabilitation, intervention, and prevention.

CHAPTER TWO

NATURAL SCIENCE

PHARMACOLOGICAL (NATURAL) ASPECTS OF ALCOHOL

The mystery of life and the nature of the world in which life is most evident and best expressed have been prime research areas in the recorded history of mankind. The quality of life has been elevated or diminished to the degree by which mankind has both understood his environment and applied personal and social values to his life in order to realize the best life possible.

While value in life suggests the possibility of factors to enhance life, value also suggests the possibility of factors that will detract from life.

The broad spectrum of the drug culture manifests a major impact on man and his environment. Many authorities¹ have established ethanol (ethyl alcohol) as the Number One drug in both volume of consumption and the comprehensive effect of the drug on every dimension of human experience.

From an educational perspective, a firm foundation in fact is essential in order to understand why a drug does what it does. Thus, the first task of this study is to prepare a general survey of how

ethanol is made...to identify the physical properties by which the drug is known...to observe some of its effects in its natural setting...to establish a preparatory overview of ethanol in alcoholic beverages with some of the essential legal dimensions.

I. HOW IS ALCOHOL MADE?

While the question seems quite simple on the surface, the inability of young and old to project a clear answer suggests an essential return to basic concepts. After sixteen years of experience in the field by the author, it was found that over 90% of the people interviewed miss the simple fact.

A simple multiple choice answer to the following question illustrates some of the confusion associated with the issue: *How is alcohol made?*

- THE ANSWER:
1. Does man make it?
 2. Does nature make it?
 3. Do both man and nature combine forces to
the task?

An answer with either (1) or (3) was wrong. The correct answer is number two (2). Many people associate alcohol with alcoholic beverages.

While there are many forms or kinds of alcohols, three of them are the most common:

1. Ethanol (ethyl) C_2H_5OH , a colorless, volatile, flammable liquid that is the intoxicating agent in fermented and distilled liquors.
2. Methanol (methyl) CH_3OH , a light, volatile, flammable,

poisonous liquid formed in the destructive distillation of wood or made synthetically and used as a solvent, antifreeze, or denaturant for ethyl alcohol and in the synthesis of other chemicals.

3. Butyle (C_4H_9OH) derived from butanes (fossil fuels or petroleum and used in organic synthesis and as solvents. It is also used in making butyl or rubber tires.²

Only ethanol has been approved or legalized by law for human consumption. The various levels of the effects of ethanol on the organs and systems of the human body will be described in Chapter III.

II. HOW NATURE PRODUCES ALCOHOL

A very simple description of the process is: *alcohol is the by-product of the decomposition of vegetable (grain) or fruit life forms.* Therefore, grains (such as corn, rye, wheat, barley, rice, etc.) and fruits (such as grapes, apples, cherries, berries, etc.) are two major groups of plant life that provide the basic ingredients or raw materials by which nature produces alcohol. Starch and sugar are two of the essential elements in those primary sources.

A. Brewing

In order for nature to produce alcohol from grain, the grain must be *brewed*. Nature usually accomplishes that task in the Fall of the year when grain ripens and falls out of its shell or husk onto the ground. When it is submerged in rain, the soaking process changes starch to sugar by the action of an enzyme called *diastase*.

B. Fermentation

When sugar is present, the process is called *fermentation*.

Fermentation is the action of yeast (a lower plant form...not an organic life form such as a bacterium). The waste product of this process is called *ethanol*. In nature, it usually vaporizes into the air and is seldom detected. However, if the process is permitted to develop in a liquid base, such as water, the alcohol will condense to mix readily in the water. When the concentration of alcohol in the water reaches a 14% solution, it has become *toxic* to the extent that the fungi (yeast) producing the alcohol literally dies in its own waste. Thus, fourteen percent (28 proof) is the strongest alcohol that nature can produce.

Any product with a higher concentration of alcohol is a product of *distillation*.

C. Distillation

Distillation is defined as:

a process that consists of driving gas or vapor from liquids or solids by heating and condensing to liquid products and that is used especially for purification, fractionation, or the formation of new products called "distillates".³

Nature cannot operate the still. The still is a rather late factor in the history of man, since the process discovery date is placed near the fourth century A.D.

Alcohol is classified as a *dehydrant* (it will draw water out of anything with which it comes in contact), and thus, it is very unstable as a chemical. This factor, also, contributes to the vaporizing or

evaporation potential of an alcoholic beverage if it is left uncovered or it is heated.

Alcohol boils at 175 degrees Fahrenheit, while water boils at approximately 212 degrees Fahrenheit. Thus, when a liquid solution in which alcohol is present is heated above the 175 degree level, the alcohol vaporizes. When that vapor is condensed, a higher percentage or proof liquid results. If that liquid is returned to the still and the process repeated, eventually, a *pure-grain-alcohol* product will be achieved. It is classified as 100% or 200 proof. Again, it is very unstable. A bottle of 200 proof left open in normal room temperature and barometric level will draw moisture out of the air into the bottle, and thus, is no longer a *pure*, or 100% product.

Pure grain alcohol is usually used in laboratory research and seldom appears in general public use because of its high cost and unstable character. The product, by law, may not be distributed or consumed as a beverage.

III. PHYSICAL PROPERTIES OF ALCOHOL

Pure alcohol is most simply described in terms of *physical properties*.

A. Alcohol Is Colorless, Tasteless, And Odorless.

The human body does not detect the *color* of the alcohol in an alcoholic beverage. The flavor detecting potential of the taste buds do not identify its presence in a beverage. The olfactory nerves (smell) do not pick up an *odor* presence of alcohol in a beverage. To be chemically correct, the odor of alcohol is never detected on the breath of a consumer. The odor is associated with the balance of the beverage.

If the predominant odor were the alcohol, all beverages would *smell* the same because it is identical in all beverages, that is, *ethanol*.

B. Alcohol Is A Dehydrant.

It absorbs the moisture out of tissue and substance.

Placed on the surface of the body, alcohol will *cool* the body because it evaporates moisture more rapidly than normal. When alcohol is taken internally, it will dehydrate tissue. In the throat, the result is often called a *whiskey thirst*. It is a condition and one of the factors that will motivate a consumer to compulsively consume. A more accurate identification is *alcoholic* drinking...directly associated with the *effect* of the chemical on the function of human tissue.

The dehydrant potential is a key factor in the shrinking and death of brain tissue which, in turn, shortens the life expectancy of an alcoholic consumer. That factor will be discussed at more length in Chapter III on Bio-chemistry.

C. Alcohol Is A Solvent

Ethanol will dissolve minerals with which it comes in contact. Since the human body is composed of basically two-thirds water and the balance is mostly chemical, the solvent potential becomes a critical factor for the alcoholic.

When calcium is dissolved in the skeletal system, the structure density is lowered and the bones become brittle and break more easily.

When other minerals are dissolved by alcohol in what is called a balanced diet, the health of the body is affected...eventually resulting in deficiencies and *sickness*. Alcoholism is judicially defined as a

disease. There is no question about the fact that an alcoholic is *sick*. The alcoholic is sick mentally, physically, emotionally, socially and in every essential aspect of a normal life.

Treatment for an alcoholic is a slow and long process and associated with much trauma. Treatment factors will be discussed in more detail in Chapter V.

D. Alcohol Is A Toxin

A person who has consumed an alcoholic beverage is described as *intoxicated*. He has a toxin within the body. To remove the alcohol from the body is to *detoxify* the body.

Toxins in commercial products are usually identified by the *skull and the crossbones*. Certain words will appear on the label of the product: *poison, harmful, for external use only, etc.*

For the person who dies from an overdose of alcohol, the coroner's report will identify the cause of death as *toxic poisoning*.

The speed by which the above physical properties work is determined, basically, by frequency and volume of consumption with the resultant blood-alcohol level in the blood stream. Again, that will be more thoroughly described in Chapter III.

IV. THE USES OF ALCOHOL

Alcohol is one of the most widely used chemicals in our society. The different kinds of alcohol can be used in a variety of ways and for different purposes. The various alcohols may be used as ingredients in a large number of commercial products on retail shelves. Chemists can make hundreds of different kinds of alcohols by varying the molecular

structure. However, ethyl or grain alcohol and methyl or wood alcohol are the best known.

During World War II, nearly six times as much alcohol was made as during an equal period of peacetime.⁴

A. Direct Uses Of Alcohol

Some of alcohol's more familiar uses in its natural chemical form are: antifreeze, as a fuel for light and heat, as a motor fuel, an infectant, and by former practice medicinally as a sedative.

B. Products Of Alcohol

Alcohols have a much broader use in making commercial products as an essential ingredient: anesthetics, cleaning fluids, flavoring extracts, preservatives, acetic acid, explosives, formaldehyde plastics, Butadiene rubber (footwear), and many synthetic chemicals.

C. Alcohols Used In Manufacturing

The physical properties lend themselves as essential ingredients in the *process* of product manufacture: hand lotions, perfumes, celluloid, dyes, drugs, photographic film, paints, varnishes, shellacs, rayon textiles, soaps, and printer's inks.

D. Alcoholic Beverages

The utilization of ethanol in its most familiar form to most people is the alcoholic drink as a beverage.

As a beverage, it plays an important role in the lives of many Americans. Approximately 70% of adult Americans drink, and about 40% drink at least once a month.⁵

An alcoholic beverage is considered an essential ingredient for hospitality. It is used with meals and for leisure-time activities.

The effects of an alcoholic beverage as a *problem* may range all the way from difficulty in swallowing a highly irritant substance to the complexity of a chronic alcoholic with all the ramifications physically, mentally, emotionally, and spiritually.

The amount of alcohol in a commercial beverage may be as low as 2% or as high as 95% or 190 proof as in *Everclear*, a commercial Vodka. The *proof* factor is generally just double the percent factor. Thus, a 4% (by weight) beer becomes an 8 proof beverage. Or, a 43% whiskey becomes an 86 proof Scotch.

V. ALCOHOL PROBLEMS

While a sizeable minority of Americans disapproves of any alcoholic beverage consumption, there is a substantial disagreement among alcohol consumers about what constitutes appropriate alcohol use and what is inappropriate use. The stereotyped image of the alcohol problem is associated with *alcoholism*.

The *skid road* alcoholic is the image most often held relative to the alcoholic, but skid road alcoholics constitute about 3% of the total consuming alcoholic community. The others are seen as good citizens, and may be quite productive, respectable family members to those outside the family circle, and even considered quite successful.

The alcoholic segment of the consuming public continues to grow annually.

Alcoholism is one major alcohol problem that has been receiving considerable attention. It causes suffering, endangers physical and emotional health problems, disrupts family relationships, and reduces economic effectiveness. The number of persons

*so affected by alcoholism and other kinds of problem drinking runs into millions. In recent years physicians, social workers, clergymen, and other professional workers, as well as community leaders and government officials, have become aware of the extent of these problems.*⁶

In 1967, when the writer joined the staff of H.A.S.T.E. MINISTRIES of which he is presently the Executive Director, the national estimate of chronic alcoholism was five million out of 204 million total population in the United States. According to the *Jellinek formula*, the standard measuring tool for alcoholism, the 1983 roll of alcoholism would total over seventeen million out of 226 million population.⁷ That rate of increase has more than trippled while the population has increased by only twenty-two million. The impact of that growth on the sociological aspects of our society, collectively, and the individual citizen will be discussed in more detail in Chapter V.

While alcoholism is a growing and very complex phenomenon in our society, this present study does not intend to press deeply into that aspect of alcoholic beverage consumption. Primary prevention is the essential emphasis of the study though occasional references will be made to the more complex aspects in order to clarify the total perspective while maximizing the merits of prevention.

In order to more fully comprehend prevention, it is incumbent to have a basic and clear picture of the human body and some key aspects of its functioning capacity in the light of *health and safety*.

CHAPTER THREE

HUMAN PHYSIOLOGY

The beauty of the human body has been acclaimed throughout history. Expressed values cover a broad spectrum of thought from the lofty heights of spiritual - aesthetics to the depths of earthy - animalistic-sexual - violent expressions. The human body is elevated to the *temple* as a dwelling place for the Holy Spirit in religious context, while the human body becomes an object of trade and self-gratification for the most base of desires in slavery, prostitution, and rape.

When an alcoholic beverage enters any phase of the broad expanse of human experience noted above, a very complicated, and too often, frustrating consequence is the result.

While some are dedicated to finding valid answers to the profound afflictions in human relations and personal life, there are many more dedicated to accelerating the deteriorating and destructive impact of alcoholic beverages on human society.

The writer's purpose in this chapter is to lay a simple foundation for the effects of alcoholic beverages on our corporate life as a social order by projecting a health and safety foundation relative to the structure and function of the human body.

I. IDENTIFICATION AND STRUCTURE OF THE HUMAN BODY

From the moment that conception takes place when the human egg is impregnated by the human sperm, a new life is developing. Medical Science has been adding continually to the body of knowledge that holds great promise for increasing health potential. However, at the same time, the complexity of the environment and the society in which we exist seems to create new complications and crises to challenge the health and safety of humanity.

The human body is composed of living and non-living materials. The living materials constitute the most vital components as *cells*. The non-living materials are recognized as the fluids in which the cells live with the minerals which are utilized to comprise the living tissue and bones.¹

It is generally recognized that the human body is approximately ninety percent water. The remainder is mineral substance. Thus, it may be said that the human body is little more than a drip with a few impurities scattered around in it. Nevertheless, that human body is the most finely-tuned, electronically-accurate, chemically-balanced, nutritionally-efficient instrument on planet earth. It will serve well, the man or woman who applies the best principles of health, exercise, and nutrition for a long and productive life.

The human body, as well as the body of an animal, is equipped to sustain life. It must and does adapt to a changing environment and threat to life with defensive activity.

The human body is uniquely provided with reproductive potential to perpetuate its own kind. It is organized on a plan that is called

bilateral or two-sided symmetry.² The limbs are structured in pairs. Some of the special sense organs are also set in pairs and are uniquely structured and located for maximum service: the eyes, nostrils, and ears. A pressure-sensitive covering of skin both protects from harm and serves to regulate heat and cold inside and outside.

There are many additional features of the human body that uniquely qualify it as the highest living and functioning order of life on this earth. In addition, there are other features even more unique that are not the specific area of immediate concern for this limited study.

Special attention is given to seven specific systems that combine to form the phenomenal life form that it is. These seven systems of the human body are:

1. The Nervous System
2. The Circulatory System
3. The Respiratory System
4. The Digestive System
5. The Muscular System
6. The Skeletal System
7. The Endocrine System

The educational curriculum through the natural, physical, and biological sciences introduces every student to those vital features of his own body. Then, in structured development, it adds to that knowledge and personal experience in successive years toward the ultimate purpose of the highest standards of health and quality survival with abstract quantities of happiness and a productive, long life.

A brief overview of each system will lay a foundation for a

bio-chemical study of health in Chapter III.

II. THE SEVEN BASIC SYSTEMS OF THE HUMAN BODY

A. The Nervous System

The one most outstanding feature that distinguishes man from animal life is the brain. It is the center of all mental activity. All sensual stimuli are focused on the brain. The film, "Alcohol In The Human Body",³ an animated presentation of alcohol's effect on the human body, pictures the nervous system as a huge telephone system. But no mechanical or electronic system could ever equal the millions upon millions of minute connections between the cells that make up the brain. The average human brain weighs a little over three pounds. The human brain is about one-fortieth of total weight while the hump-backed whale's brain is only one-twelve thousandth of body weight.⁴

The brain is suspended in a liquid solution which helps to cushion the brain from sudden shocks.

The *cerebrum* is the part of the brain that basically sets man apart from animal life. The cell structure of the brain is made up of both gray and white cells: the gray on the outside of the brain to control activities and to think, and the white, forming the larger part consisting of nerve fibers, to carry nerve impulses.

The brain is divided into halves, the right side controlling activities on the left side of the body and the left brain controls the right. Every function of the body has a corresponding control center in the brain.

The *cerebellum*, the next largest portion of the brain, lies below and behind the cerebrum. It also contains both gray and white cells.

The white nerve fibers are connected to and from the spinal cord to all parts of the body. It is the connecting center between thought and action and is often called the motor-control center.

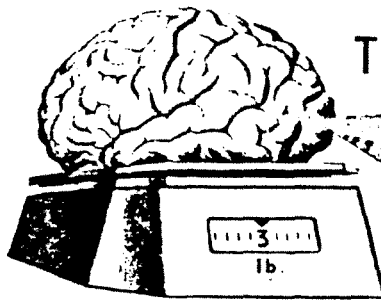
The *medulla oblongata* forms the top part of the spinal cord that enters the brain. By the time the nerve fibers reach the medulla, they have crossed to the functioning side of the body. It has two main functions: (1) it carries nerve impulses as a transmission center between the spinal cord and the brain, and (2) it is the control center for the vital functions of breathing, circulation, and digestion. It also plays a vital role in temperature regulation.

Service cells in the brain are in a constant state of repair and replacement. However, nerve cells, once severely damaged or destroyed, are never replaced. The brain possesses a phenomenal power to transfer critical functions from damaged or destroyed cells to the remaining cells. Of course, there is an ultimate point of transfer that cannot be passed so that permanent loss is evident.

B. The Circulatory System

Circulation is the means by which all the cells and tissues of the human body receive nutrition and oxygen and dispose of their waste materials. The system consists of the heart, the arteries, veins, and smaller vessels called the capillaries. The fluid medium of the system is the blood.

The heart is a muscular organ with four basic chambers. Valves control the flow of blood between the chambers. While the heart's primary purpose is to circulate the blood to all parts of the body, it also has its own blood system by which it receives nourishment, the



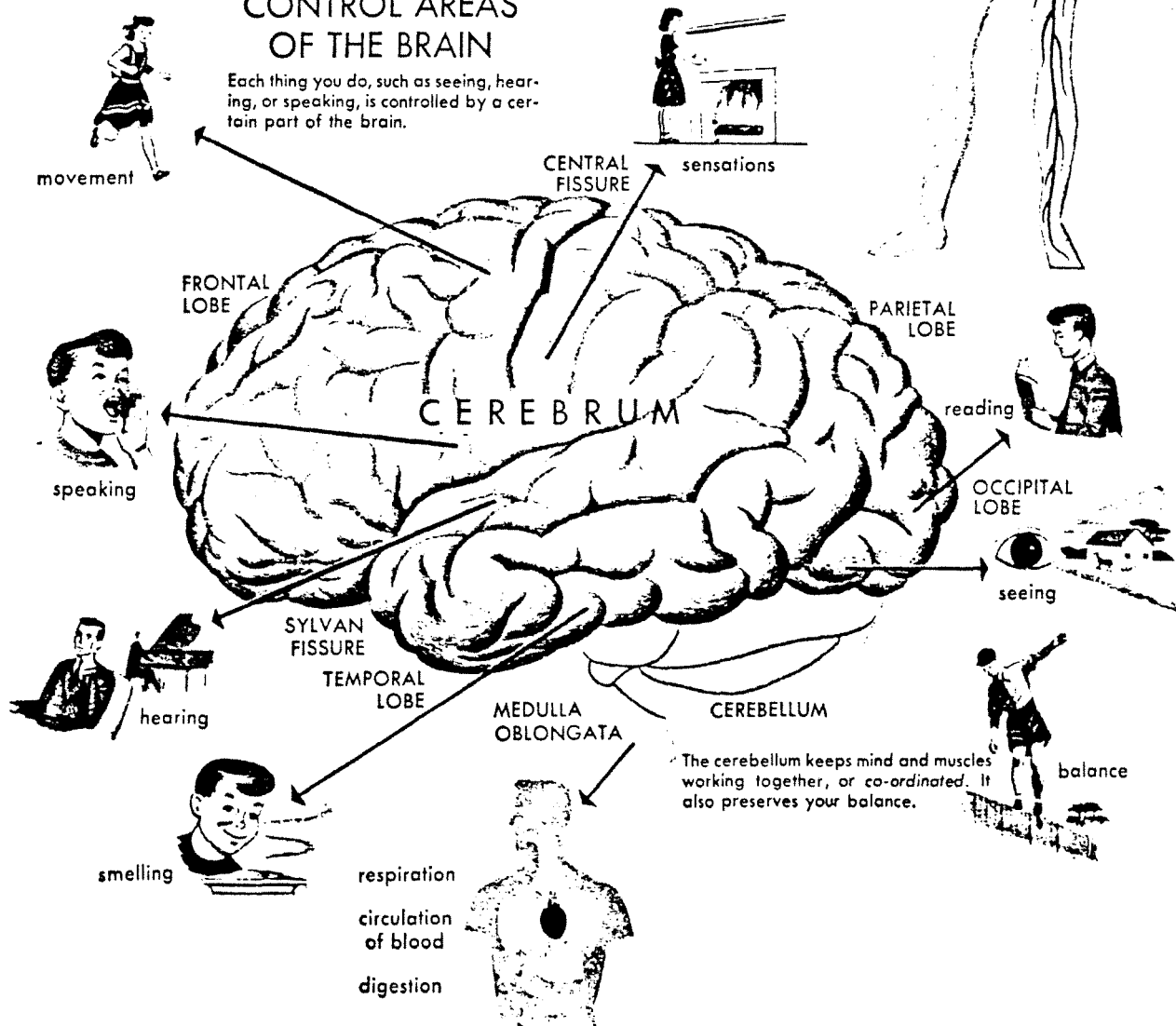
THE HUMAN BRAIN

The brain weighs only about three pounds, but it directs all your thoughts, feelings, and actions. It has been compared with a giant telephone switchboard. Just as you dial a telephone number, each brain cell can "dial" messages to other brain cells in billions of different combinations.

Through the nervous system, the brain controls the entire body. The left half of the brain controls the right side of the body, and the right half of the brain controls the left side of the body.

CONTROL AREAS OF THE BRAIN

Each thing you do, such as seeing, hearing, or speaking, is controlled by a certain part of the brain.



same as every other cell and tissue.

The right side of the heart pumps the blood to the lungs having received it from the body. The left side of the heart receives the blood from the lungs and pumps it out to the body again.

The heart begins to form as soon as the embryo begins to develop. Its first form is similar to a tube that quickly doubles back over itself and forms the heart as we know it. In its developing stage, the heart is nine times as large in proportion to the whole body as in an adult.

The work-load of the heart is one of the great miracles of the human body. Normal heart rate is approximately 72 beats per minute or 103,680 per day, and 37,833,200 per year. It pumps the blood through more than 100,000 miles of vessels. The volume of blood circulated is 5 quarts per minute, or over 1,600,000 gallons per year.

Diseases of the heart and blood vessels are called *cardiovascular*. These diseases are responsible for over half of the 1,500,000 deaths annually...the Number One killer.⁵

While the heart is subjected to many other diseases and perils, the effects of alcohol on the heart will be discussed in Chapter III.

C. The Respiratory System

Breathing is a vital function that must be sustained constantly. The process supplies oxygen to the cells of the body and removes carbon dioxide. Denial of that oxygen supply will result in suffocation.

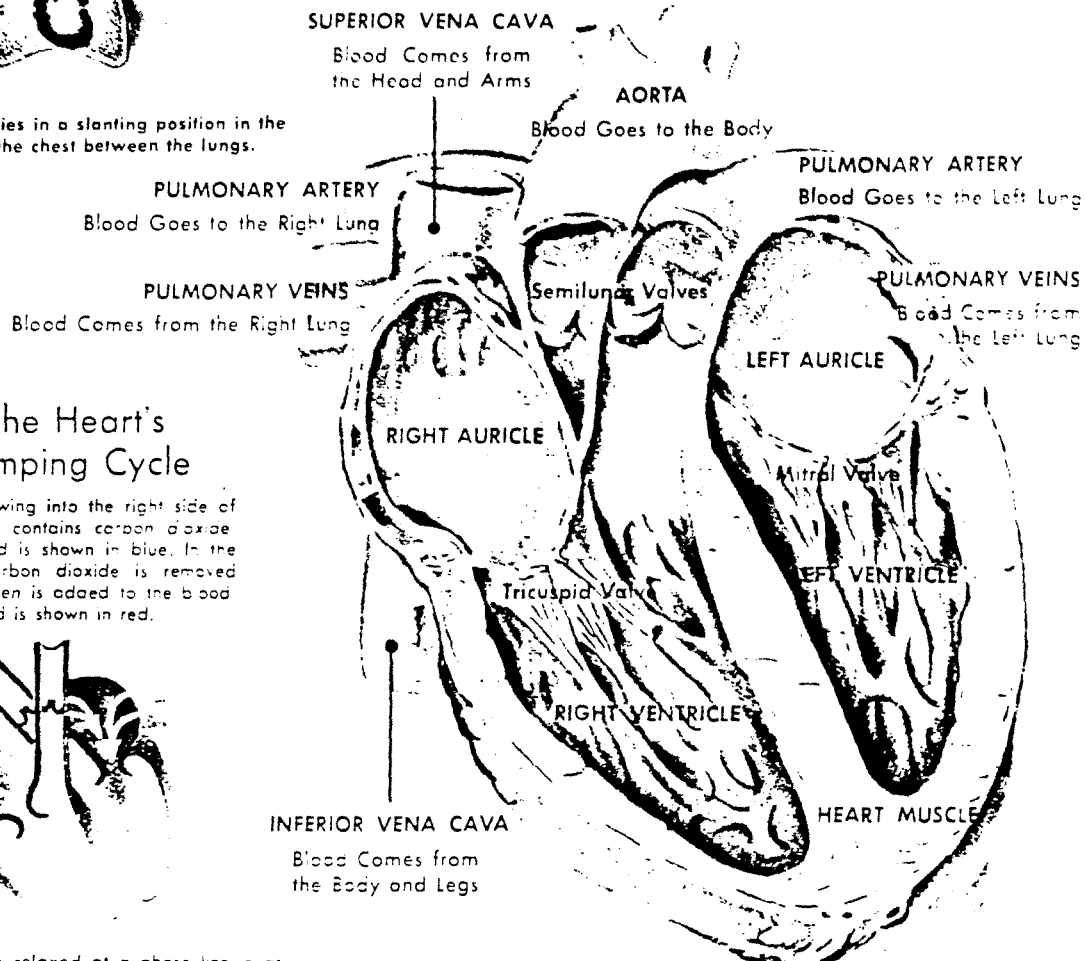
Respiration of some sort is common to all cells, plant as well as animal. In plants, however, the process is reversed. They take in carbon dioxide and release oxygen through a process called

HOW YOUR HEART WORKS

Blood enters the right auricle of the heart. It is pumped through the right ventricle into the lungs. From the lungs, it flows through the left auricle and ventricle into the aorta, a main artery of the body.

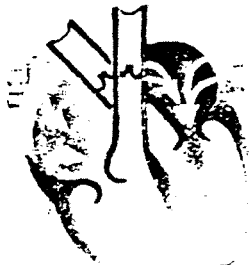


The heart lies in a slanting position in the middle of the chest between the lungs.



The Heart's Pumping Cycle

Blood flowing into the right side of the heart contains carbon dioxide. This blood is shown in blue. In the lungs, carbon dioxide is removed and oxygen is added to the blood. This blood is shown in red.



The heart is relaxed at a phase known as diastole. At this stage, blood fills both auricles. Some blood flows into the ventricles.



At a phase called systole, the auricles contract, squeezing more blood into the ventricles through the mitral and tricuspid valves.



Next, in the systole stage, the ventricles contract. This squeezes the blood through the semilunar valves into the aorta and the pulmonary artery.



The heart relaxes into the diastole phase. The semilunar valves close, and the mitral and tricuspid valves open. Blood flows into the auricles. The cycle begins again.

photosynthesis.

Both the heart or circulatory system and the muscles or muscular system are vitally involved in the respiratory system.

The normal volume of air inhaled at one time is approximately one pint. The maximum air capacity of the lungs is about four quarts. Deep breathing is important for the circulation of the blood through the lungs.

It is the muscular expansion and contraction of the rib cage and diaphragm that force the breathing process. That muscular function, in turn, is triggered by the impulses of the nervous system.

The breath rate is normally activated and varies with the amount of carbon dioxide in the blood. The brain cells are very sensitive to carbon dioxide and trigger an increased rate to remove it in the lungs.⁶

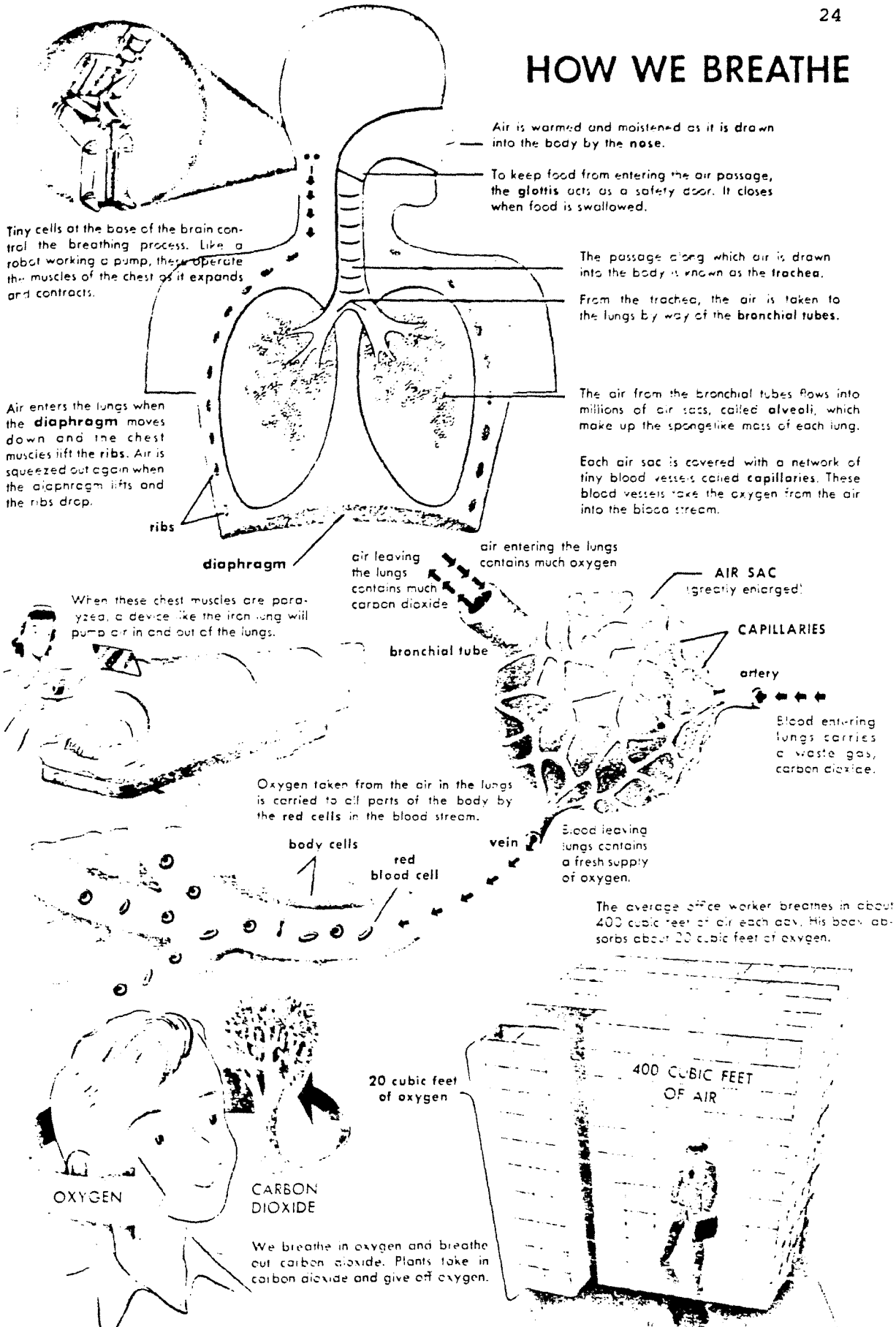
Abnormal excitement may also cause the breath rate to increase, and may result in hyper-ventilation, or removal of too much CO₂. A low CO₂ may cause a person to pass out.

D. The Digestive System

Digestion is the process by which food is broken down to a form that may be carried in the circulatory system and assimilated by the tissues of the body. Digestion takes place in almost all parts of the alimentary tract. The mixture of food with enzymes speeds up the digestive process.

Foods, such as starches and sugars, or carbohydrates, fats, and proteins, are made up of very complex molecules and must be digested or broken down. Foods, such as vitamins, minerals, and water, do not require digestion.

HOW WE BREATHE



Various aspects of the digestive process are conducted all the way through the tract. The chewing action adds saliva, the stomach adds hydrochloric acid, or gastric juices, the intestinal tract adds pancreatic juice and bile. Intestinal juice is produced by the walls of the small intestines.

The large intestines contribute very little to the digestive process. The waste materials that collect are roughage and residue that cannot be digested and are eliminated from the body. The large intestines are active in the reabsorption of water.

The stomach is the most important of the digestive chain. Hydrochloric acid initiates digestive action on the food and makes it easier for the pancreatic juices to work. A normal food diet will pass through the stomach within about three hours. However, water and liquids are permitted to pass through with little resistance.⁷

E. The Muscular System

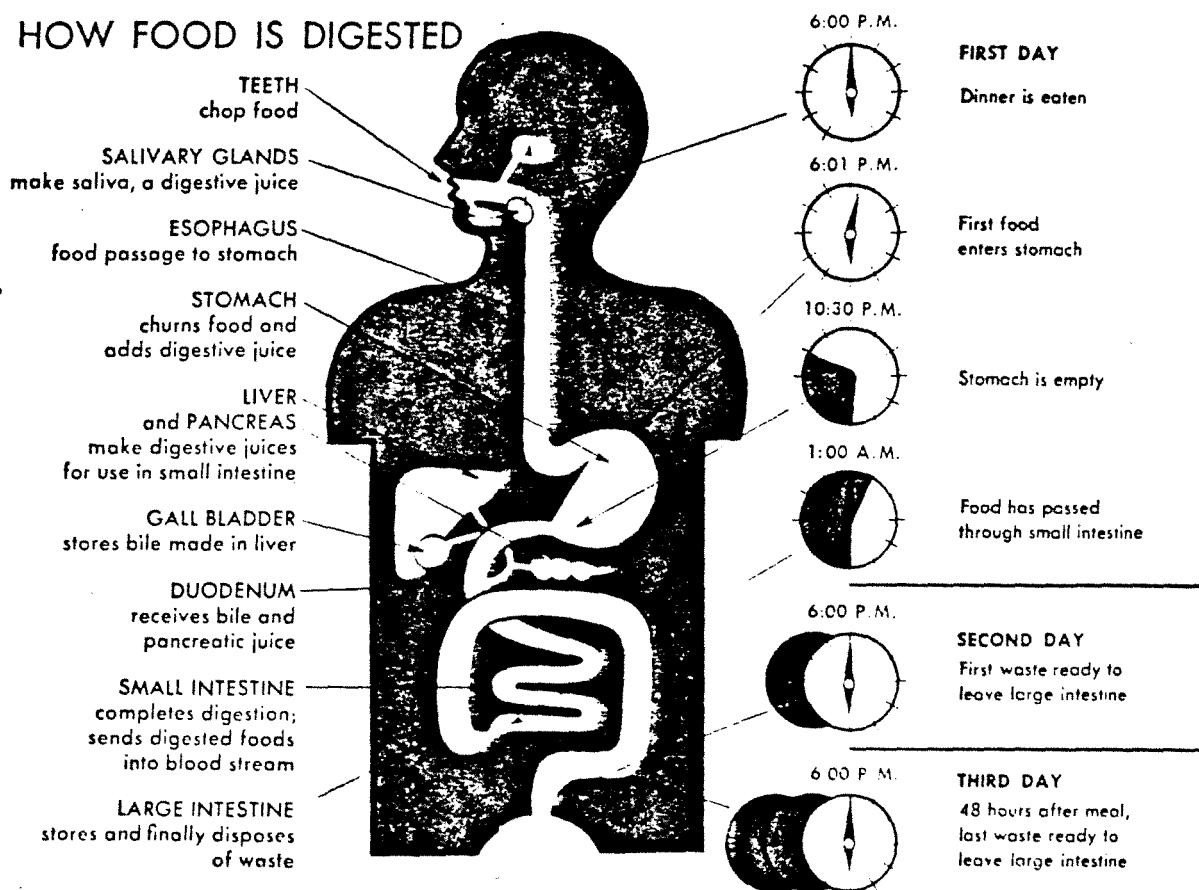
The muscular system is responsible for physical motion so that the body may move about. The system is also an essential function in the digestive system to facilitate the rolling action of the stomach and the intestinal tract.

To activate the muscle, the brain sends a message to the middle portion of the muscle through nerves.

Involuntary muscles, such as those of the stomach, intestines, arteries, and the heart are activated and controlled by the medulla.

Voluntary muscles are usually activated by a conscious and determined signal from the volitional part of the brain.

HOW FOOD IS DIGESTED



Most muscles come in pairs to constitute an opposing action.

Muscle tissue is under constant repair and renewal. Exercised muscles build up lactic acid, causing a tired feeling. Rest will permit the body to eliminate the acid and restore the full muscle potential. Thus, proper exercise, nourishment, and rest are important factors for muscular ability and power.⁸

F. The Skeletal System

The skeletal system gives the human body its form. With the muscular system, a man is able to move about. The skeletal system also protects the vital organs.

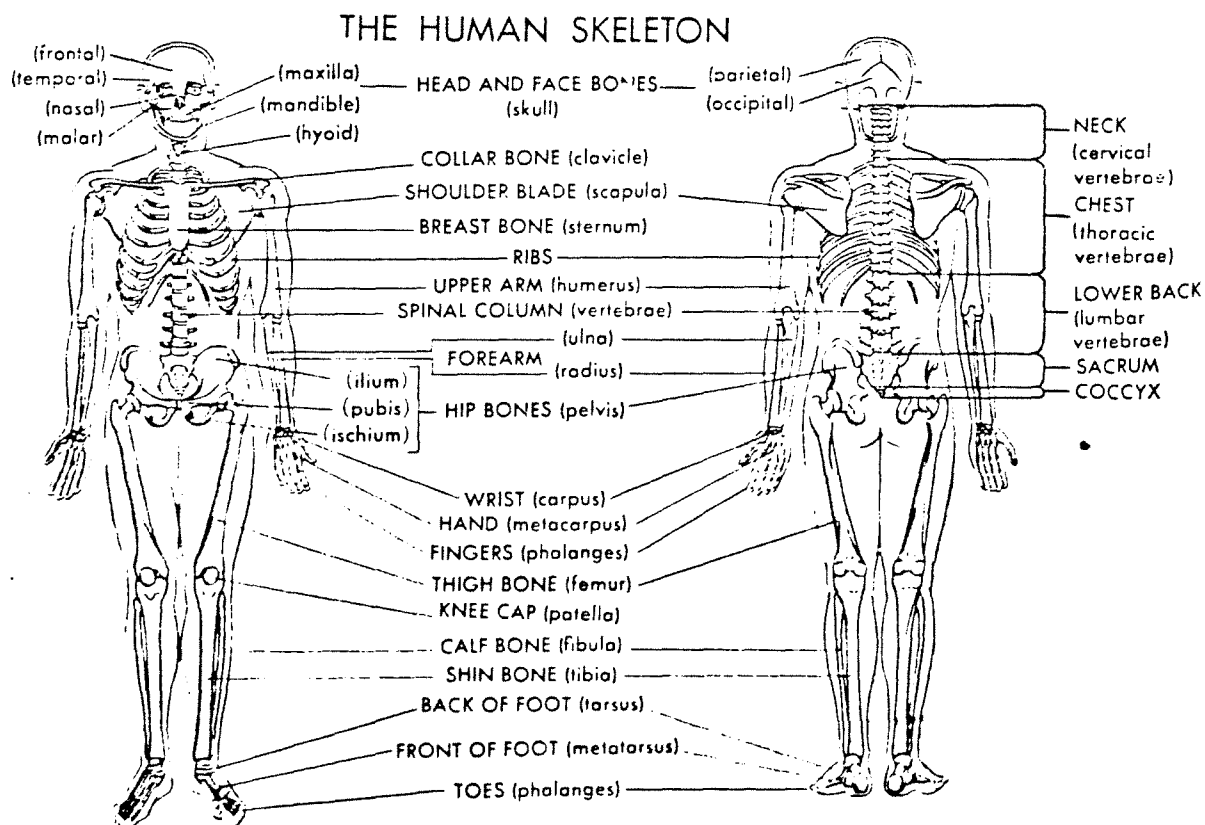
The human skeleton is made up of about 200 bones. There are 64

bones in the hands and arms alone.⁹

We are primarily interested in the skeletal system in at least three areas of this study:

- a. The role of calcium in the formulation of the bone structure.
- b. The role of the bone marrow in the production of blood cells.
- c. The effects of alcohol on the functional and structural aspects of the skeletal system in coordination.

These factors will be integrated into succeeding chapters.



G. The Endocrine System

The endocrine system is made up of all the glands in the human body that secrete enzymes for the utilization of the complex inter-relationship of digestion, circulation, and neural functions.

A very important part of this system includes the lymph glands, producing a fluid that circulates between the tissues and cells that make up the body. Lymph fluid carries food to the cells and carries away waste substances very similar to the blood.¹⁰

Of particular concern for this study is the production of prothrombin by the liver and utilized by the platelets to clot the blood. That subject will be taken in context in Chapter III.

The normal, proper functioning of these seven basic systems will give the human body great potential for health and safety. Consumption of an alcoholic beverage effects marked disturbances in these systems. That is the subject of the next chapter on Bio-chemistry.

CHAPTER FOUR

ALCOHOL AND BIO-CHEMISTRY

The cost of health care has been likened to a giant *Pac Man* in an address before the nation's governors. *Health care is the single most inflationary factor in the American economy today*, New Jersey Governor Thomas Kean said in a report to the winter meeting of the National Governors' Association.¹

In this year, 1984, more and more programs extol the virtues of proper health care. There are special diets to achieve the ideal weight for a specific body and life style. There are unique exercise programs to develop aesthetically pleasing and symmetrically exciting physiques. Vitamin supplements are acclaimed as the ultimate perfection for a balanced nutritional solution to perfect health.

At the same time, we are told in the event that you do not feel well, "Take a pill!" "It will make you feel better!" Pharmaceutical firms push their new products through doctors to a suffering society as a cure for all their ills. We even segregate the number one drug, alcohol, from all the other drugs controlled under the Federal Food and Drug Administration, then permit it to be advertised - even exempt the advertising from taxes - before our most cherished sports activities on both the professional and amateur levels. Of course, it is all only

for the social or moderate drinker.

To those who develop a "problem life", alcoholism is diagnosed as a disease in which the patient is no longer responsible for his or her own life or the compounded impact of that life on family and community associates.

Then we are informed that, since health and hospital costs are rising to astronomical levels, unless we take drastic economical measures that vast majority of our society will no longer be able to afford the most elementary of health care.

It is the purpose of this study to describe and identify some of the basic effects of alcohol on the human body, a functional and structural masterpiece.

I. LIQUOR BY THE DRINK

Before the effects of alcohol are enumerated, a brief review of the alcoholic beverage field must be included. For example, consider the following very basic concept:

Which of the following "drinks" contains the most alcohol by weight?



A "shot"



A glass of wine



A bottle of beer

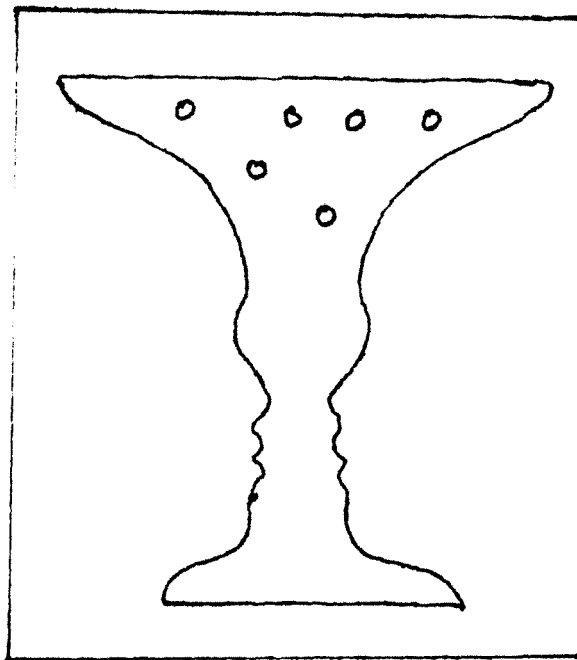
The answer...The alcohol content is essentially equal in each drink. The drinks are, of course, different sizes. Also, they are of

different "proof" or "concentration". If distilled, each drink would yield approximately one half ounce of pure "ethanol".

For that reason, a person will become intoxicated just as easily on beer, wine, or whiskey...drink for drink, whether of one kind alone or a mixture. A person will become intoxicated "faster" on whiskey than on beer because the proof or concentration is higher, but no "drunker". The higher concentration facilitates a faster absorption rate.

With the amount of confusion associated with so basic a concept as that noted above, every person, drinker or non-drinker, should ask the question, "Do I Know Enough About It?"

Some answers are confusing. Again, looking at the object below, what do you see? As one focuses on the central object, you might see a wine glass. Enlarge the image and change the scene to a lawn, the object becomes a bird bath. If one focuses on the shaded area, the outline of two persons in profile are visible. If the object is turned up-side down, the central object becomes a candle holder, or, two persons looking at each other while standing on their heads.



The point is...one often sees what he wants to see!!

When some consider an alcoholic beverage, they will see what to them is the positive side: it is a party...it is Friday, a lost weekend...it is graduation, a celebration...it is summer, a vacation...it is a birthday, a wedding, it is a "death". Yes, it is true that some will celebrate death, but not all.

The celebration of death is associated with much conflict. An individual places the name of a loved one on a legal document called an insurance policy as the beneficiary. Usually, the beneficiary is not informed of the listing. If an accident takes the life of the insured, the beneficiary is awarded the benefit that may be thousands of dollars. Now, does the beneficiary celebrate at the occasion of his good fortune, or cry at the loss of someone who demonstrated great love for him and now he is unable to express a personal "Thank You!"?

II. BIO-CHEMICAL EFFECTS: PHYSICAL PROPERTIES

Alcoholism in a sociological context will be discussed in Chapter Six. At this point the focus is the effect of ethanol (ethyl alcohol) on the tissues, organs, and systems of the human body.

A brief overview of the semantic aspect of some terms often associated with alcoholism and addiction is essential.

The contextual association of addictive alcoholism in current usage is identified as a serious problem. While the rejection of society to the negative force of addiction has been softened considerably by the classification of alcoholism as a disease, our major professions (physicians and surgeons, clergy, legal, psychologists and psychiatrists, and counsellors), institutions (hospitals, schools, penal systems and mental health facilities), and governmental agencies

(legislatures, jurisprudence systems, and health and human service divisions) continue to wrestle with a rapidly growing work load that is exhausting available funding sources.

The tendency is to cover-up or camouflage the symptoms. An adequate and realistic diagnosis of the problem is never achieved fully. Thus, the prognosis in resolution of the problem leaves much to be desired.

In contrast, the social or moderate consumption of alcoholic beverages is identified by the majority of our society as acceptable behavior and a norm. Therefore, it is normal to drink - but one must not become an alcoholic - that is unacceptable.

It has been the observation of the writer, after over thirty years of counsellor and educator experience, never to have met an alcoholic who wanted to become one. That is not to say there is no such person or experience. However, if there were such an admission made, usually, it would be classified as unacceptable or deviant behavior and the person would be institutionalized.

Another extension of the semantic morass is the drug abuse mentality. The writer has searched many years for an adequate definition or description of how a drug is hurt or abused. Again, it is a semantic perplexity. A drug possesses absolute properties or characteristics by which it is identified. Therefore, the activity or behavior of the drug is very predictable. The drug is not the problem. The variables of human physiology and behavior form the bases for problems that are very difficult to isolate and treat effectively and satisfactorily. With the other semantic concerns, primary prevention

(that is, disarming the problem before it begins) has become a difficult and monumental pursuit. However, it is a pursuit with very positive and profitable dividends.

In light of the foregoing semantic variations - even confusion - it is the purpose of this chapter to focus on the effect of ethanol in its bio-chemical context. That is the effect of a chemical from the first release of its physical properties on the function and structure of the cells, organs, and systems that constitute human life.

From that viewpoint, the principal emphasis of this study is drug effect, not drug abuse, on the function and structure of every kind of cell in the human body. Some cells, when damaged or hurt, may be repaired - they heal. A person may fall and be severely bruised and cut. The patient will be taken to the doctor. He will immediately clean the wound...removing all possible source of foreign material for infection. If the wound is deep enough, he will either suture or clip the wound to close it. After applying an ointment to aid healing and prevent severe scabbing, he will bandage the wound to keep it clean and protect it. If the patient is careful and cooperative, the wound will heal from the inside out, almost without a scar. The human body normally possesses a phenomenal drive to survive and will serve one well with proper care.

However, if one damages the spinal cord, or one of the very unique and essential organs of the human body, repair and restoration may not be possible. Some organs do not have a capacity of repair, restoration, or replacement.

In a general sense, mind altering drugs fall within three basic

categories. They are (1) stimulants, (2) depressants, or (3) hallucinogens, that is, mood disorientors. Pharmacologically, drug identification is much more precise and detailed.

While such a drug is present in the body, it will release its power-pack to either stimulate, depress, or disorient. It will have a specific drug effect on the function of every cell, organ, and system of the body. When the drug has been removed from the body by detoxification, the function of cells will return to normal, almost. While the drug was present it was not only having an effect upon the function of cells, but also upon the structure of cells. When damaged, some cells can be repaired, but in other cells the damage is permanent, progressive, and irreversible. Every person has but one brain, one pancreas, one liver and several additional organs that are very unique. There are few transplants in most of these instances and, in some, it is impossible.

The victims of accidents resulting in paraplegics and quadraplegics in professional sports and high school scholastic sports give all too graphic illustrations of the peril to these organs and systems once damaged or destroyed. The only difference between an accident and a drug oriented deterioration is time.

Cirrhosis of the liver in an alcoholic gives valid evidence of the deteriorating capacity of alcohol to slowly destroy the tissue. Note the contrast in the tissue texture between a healthy liver and an alcoholic liver as pictured on page 36. *Liver cells are the only ones in the body with the chemical artillery needed to metabolize ethyl alcohol. This makes the liver the most vulnerable of all our organs to alcohol's ravages.*²

III. BIO-CHEMICAL EFFECTS ON BASIC METABOLISM

A simple overview of the metabolism of alcohol on the organs and systems is covered later in this chapter.

A. Intoxication

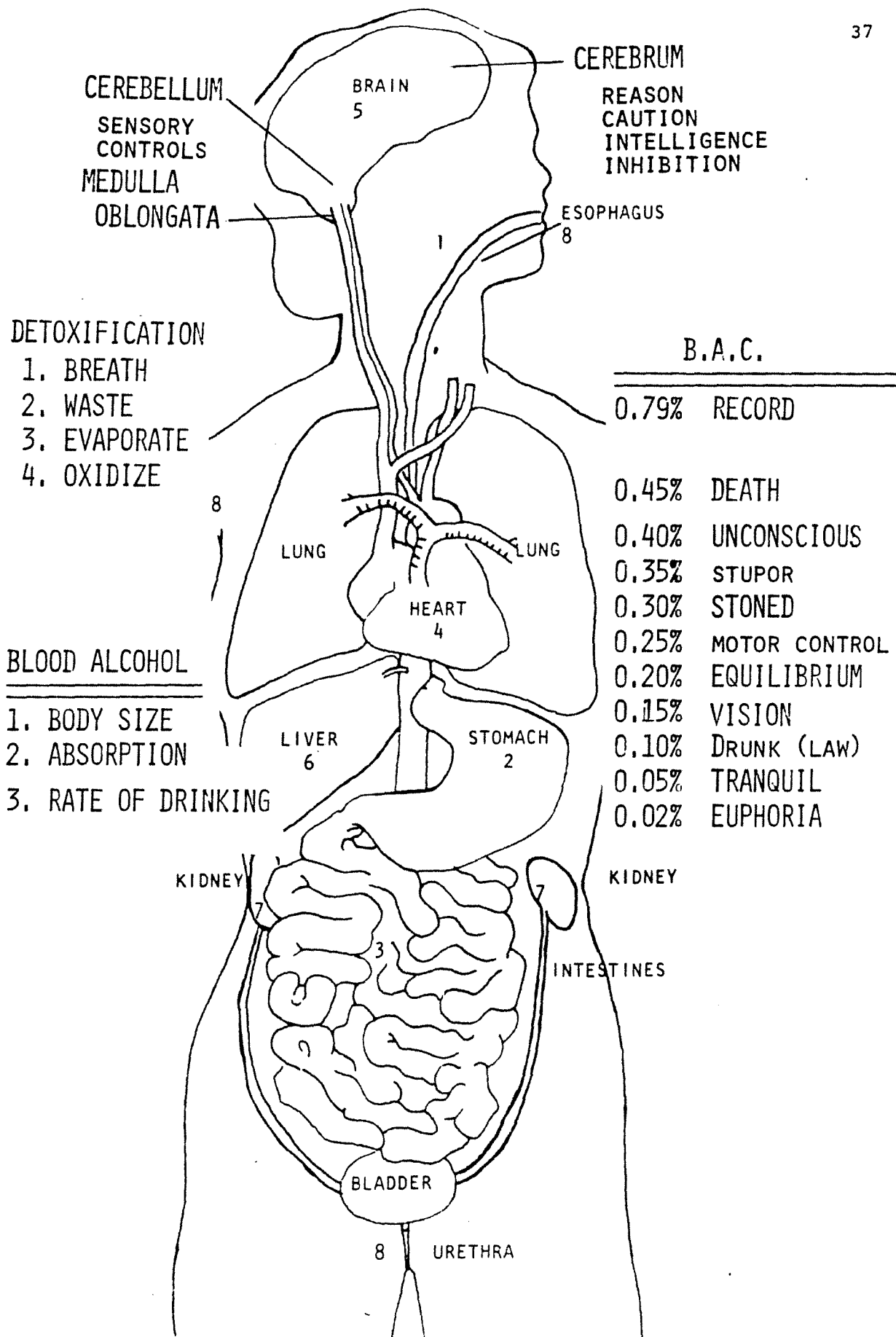
This term is usually associated with the condition of drunkenness or with violation of a blood-alcohol code such as 0.10%. However, for this study, the term will be used in its generic sense to identify the process of introducing an alcoholic beverage into the human body. It is very simple. A person drinks it.

The concentration of study will be on the alcohol content of the beverage - a half ounce per standard, fair traded "drink".

The alcohol enters the body and moves down the alimentary canal to the stomach. A very small amount of the alcohol is absorbed through the cell walls of the canal to the blood vessels. The major portion of the alcohol is absorbed through the stomach walls and the walls of the intestinal tract. See the diagram on the following page.



Compared with smooth and normal-colored healthy human liver, *top*, the diseased liver of an alcoholic is knobby and ravaged by scar tissue.



On an empty stomach, alcohol is absorbed very quickly. With food in the stomach, it will be suspended in the food and, thus, the absorption will be slowed. Normally, within an half hour, the alcohol from a given drink will be absorbed entirely into the circulatory system. From the circulatory system, alcohol will be absorbed by simple osmosis through the system walls to penetrate the cells and tissues between the blood vessels. This flow of alcohol is very similar to that of a flood, overflowing the banks, only to flow back into the blood vessels as the blood-alcohol concentration is lowered.

B. Detoxification

Detoxification is the term which describes the removal of alcohol from the body. There are four avenues of escape for the alcohol:

1. Breath

While the alcohol is circulating in the circulatory system, a very small portion of the blood is filtering through the lungs consistently. In the exchange between oxygen and carbon dioxide in the lungs, a small amount of alcohol will be unloaded also. This alcohol in the breath is the principle on which the breathalyzer test is based - prima facie evidence of intoxication for violation of the D.W.I. (Driving While Intoxicated) laws. That subject will be addressed more fully in Chapter Nine.

2. Waste

A small amount of the alcohol will be absorbed through the abdominal walls into the urinary bladder. Alcohol in the urine is the basis of the urine test used by some states to support a D.W.I. charge.

3. Evaporation

A very small amount of the alcohol will escape from the body by evaporation through the pores of the body into the atmosphere. The three procedures above will remove approximately five percent of the alcohol ingested.

4. Oxidation

The other ninety-five percent will be removed by oxidation accomplished by the liver. The process will be discussed more at length in the section focused on the organic impact of alcohol. The liver will oxidize approximately a half ounce of pure alcohol in one to one and a half hours.

C. Blood-Alcohol

A person who drinks faster than the liver can burn the alcohol will build a blood-alcohol which will be determined by, (1) the body size, (2) the absorption rate, and (3) the number of drinks consumed.

As the B.A.C. (the blood-alcohol-content) increases, the first level of attack as an anesthetic depressant will be observed on the frontal lobe of the brain, the cerebrum.

The cerebrum is the control center for such functions as: reason, caution, intelligence, and inhibitions. Caution is recognizing a dangerous situation. Reason is the problem solving capacity in the light of difficult situations. Intelligence is the storage of all the information learned in school and in daily experience for future reference. Inhibitions cover such experiences as self-awareness and how one relates to other people.

Some people cannot have fun at a party until they have had a drink

or two. Some even hit the bottle before arrival at the party. It may be to build the ego and self-image or machoism. With a drink or two, some will become very docile or peaceful...very quiet. Others may manifest a very hostile attitude. He is the kind of person who fights very easily - they break up parties. Some will develop a *Don Juan* complex...very affectionate...great lovers. There are some who are easily bored with a few drinks. They feel that the party is a drag. Their first impulse is to pick up a few buddies and split the party. They pile into a car...someone pushes a tape into the deck with the volume wide open. Some cars can be heard for blocks. All the while, nobody is really watching the road too carefully. The driver hits the edge of the road and goes into a little skid...over-compensates in the attempt to correct the skid and goes into a counter spin and out-of-control. The result is a one-car accident...hitting trees, bridge abutments, parked cars or rolling it over. The one car accident is taking more teenage lives than any other class of accident.

All of the above is a very common experience in the 0.01% to 0.10% blood-alcohol.

Above a 0.10% B.A.C., the effect is observed in the cerebellum, the sensory control center. Multiple car accidents are a common result. Forty-four percent of the fatalities in multiple car accidents are innocent people.³ The driver experiences double vision. Also, he has tunnel vision. Consequently, he is responsible for intersection and side-swipe accidents.

At a 0.30% B.A.C. the individual may be stuporous. This person is often associated with a skid road alcoholic. He drinks in excess to

cover his fear of failure. He cannot stand himself when sober. He has no job, no car, no home or family (his family has told him to take a walk until he is ready to stop drinking). He only has a friend when he has a bottle. When the bottle is empty, his friend is gone in search of another friend (bottle).

With a 0.40% B.A.C., the average person will lapse into unconsciousness. At this point, the liver has an opportunity to lower the blood alcohol. Consumption has been at a rate faster than the liver could burn or oxidize the alcohol.

The rate of consumption is often associated with an alcoholic life style. There are three escapes: (1) Never take the first drink. It is called total abstinence. It is a valid alternative. (2) Lower the B.A.C. to zero consistently. (See page 37). It is called rehabilitation as in the Alcoholic Anonymous terms...no drink, just for today.

(3) Raise the B.A.C. above 0.45%. It is an escape, but the lethal route. The person drinks faster than the body can absorb the alcohol from the stomach into the circulatory system. He will build up a high volume and proof in the stomach. When he passes-out, the blood-alcohol will continue to rise until it levels off with that in the stomach. If the volume and proof are sufficient to raise the blood-alcohol above the 0.45% B.A.C. the medulla oblongata will be anesthetized, the electronic pulse that triggers the heart will cease, circulation will stop, breathing will stop, all vital functions cease. The coroner's report will read, "Death by toxic poisoning". It is a one-way trip. The highest blood-alcohol on record in Washington State is a 0.79% B.A.C.. The record was set by a 16 year old youth from Enumclaw,

Washington on July 7, 1968.⁴

The overdose tragedy will seldom occur in a licensed outlet such as a tavern, cocktail lounge, or restaurant because the liquor regulations prevent service to a person with a B.A.C. over 0.10%. There are criminal liabilities associated with violation. Usually, the overdose syndrome will be found in a private party where the motivation of contests and peer image predominate with underage consumers.

IV. BIO-CHEMICAL EFFECTS: ORGANIC AND SYSTEMIC

As an educator, the writer is primarily interested in information as a body of knowledge that is valid and documentable upon which an individual may construct a positive and productive life style with confidence.

In a free and diverse society, information may be shaded by many motives rooted in conflicting values. The writer's intent is to move as close as possible to unadulterated truth in bio-chemistry to place the spotlight on what happens when alcohol enters the human body. The first part of this chapter reviewed basic metabolism relative to alcohol in a superficial perspective. Now, a more penetrating look at the effects of alcohol on the individual organs and systems and some of the medical aspects that are usually noted only in a crisis reference as addiction will be noted. However, in so far as the crisis condition is initially related to the physical properties of an absolute chemical, the immediate effect of the drug upon introduction is of primary interest.

While the content of this chapter is not intended to be moral in nature, the negative and destructive consequences of cause and effect

tend to communicate moral overtones. By moral, the writer means that which connotes "good" and "bad" experiences. The subject of ethics is basically best described and defined as that which is either "right" or "wrong". Chapter Eight is reserved for a closer look at those aspects.

Therefore, let us follow the path of ethanol through the body to identify some of its effects on the organs and systems while on that journey until it has been removed by detoxification.

The writer is deeply indebted to Dr. Max Schneider, the University of California, and his study on The Medical Aspects of Alcohol for much of the context that follows.⁵

A. The Esophagus and Stomach

An alcoholic beverage taken orally, after it has passed through the mouth, will quickly move through the esophagus to the stomach where it will pause for a while in its journey. While there are a number of physical properties by which ethanol is known and identified, two are most prominent: irritant and sedative.

The stomach is a fascinating organ. It secretes hydrogen chloride which is called hydrochloric acid. While the skin produces an oil to protect itself from the irritating effect of the salt in perspiration, the stomach produces a protective chemical called "mucin"⁶ which protects the lining of the stomach from the hydrochloric acid.

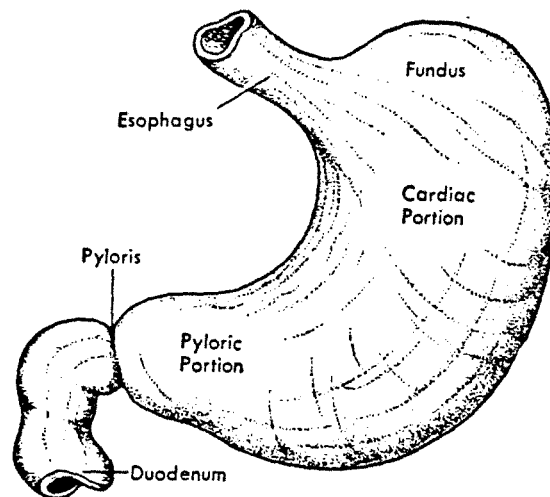
When more acid is produced than mucin, the protective barrier is insufficient and an inflamed lining of the stomach results. This is called gastritis.

The irritating effect of alcohol is to cause the sweat glands of the stomach to produce hydrochloric acid in its

*maximum amounts within 20 minutes after ingestion of a single shot of booze. As a matter of fact, alcohol is probably the greatest single irritant that we can ingest.*⁷

Of course, the primary purpose of the stomach is to serve as the focal point of the digestive system.

THE STOMACH



The hydrochloric acid produced by the stomach helps to break down the proteins in foods. A peristaltic action, caused by contractions in the muscular walls of the stomach every 20 seconds, both mixes the food and moves it on toward the pyloric valve at the end of the stomach and the entrance to the small intestine.⁸

Serious complications may develop in the stomach from the effect of alcohol. Two of these complications are called ulcers and gastric-hemorrhage. A heartburn occurs after ingestion of alcohol when the mixture of alcohol and hydrochloric acid is forced back into the food

pipe resulting or causing a burning sensation. The ulcer forms when the acids break through the unprotected lining to burn a hole. If several or even one major vein or artery is in the ulcer, a bleeding ulcer is activated. A perforated ulcer burns through the wall to permit escape of the stomach contents and causes peritonitis, an acute surgical emergency.⁹

B. The Intestinal Tract

While foods are prepared for digestion in the stomach and then continue into the intestinal tract to be absorbed into the blood stream, alcohol is not processed the same way. Ninety-five percent of the alcohol is absorbed through the lining of the stomach and the first part of the intestine called the duodenum.

*Within 20 minutes from the time of taking a glass of booze on an empty stomach, it is absorbed into the blood stream. Now if this alcohol is diluted, for instance, with water or a coke, or if you have just had a meal, then the rapidity of the rate with which the alcohol gets into the blood stream and the rapidity with which it builds up a level in the blood stream are slowed down by the dilution factor. So you can see that drinking alcohol on an empty stomach will have a stronger and more rapid effect than drinking with or after a meal.*¹⁰

C. The Skeletal System

One of the physical properties associated with alcohol is its solvency potential. It dissolves minerals. It increases the excretion of minerals from the body. Alcohol washes zinc, magnesium, and other

trace minerals out of the body affecting taste and smell. By dissolving the calcium in the bones, they become brittle and break much easier creating a serious condition for the elderly. Alcohol accelerates osteoporosis, the demineralization of the skeletal system.

Since blood cells are formed or manufactured in the bone marrow, alcohol impedes the production of the blood cells causing anemia. *Taking iron pills for this type of anemia may be harmful because the excess iron is deposited in the liver and adversely affects the liver. Red wine does not make red blood.*¹¹

D. The Pancreas

After alcohol enters the blood stream, it moves quickly to penetrate every cell and tissue of the body. The cells and tissues with a higher percentage of moisture absorb the alcohol more readily and faster than those with higher density and less moisture. The brain, with a larger blood supply and a higher moisture content, is more extensively impacted by alcohol. The effects on the brain will be considered later. One of the organs that picks up alcohol in large amounts is the pancreas.

The pancreas lies underneath the stomach and close to the intestine. It is responsible for the manufacture of two groups of chemicals called amylase and lipase. They are secreted by the individual cells of the pancreas, are collected in tiny canals, then emptied into the small intestine. They help digest the proteins and fats in the intestinal tract.

When the alcohol penetrates the tissue of the pancreas it causes an irritation and swelling that blocks the passage of the enzymes and

forces them to accumulate and digest the pancreas itself. That condition is called acute hemorrhagic pancreatitis.¹² It is a very painful condition. Patients seldom need to be urged to enter the hospital.

*One out of ten patients who develop this disease die in their first attack. Of those who survive and never drink again - one will develop chronic recurring pancreatitis and the others will get well. If those who get well begin to drink again - even just an occasional "binge" - many will again develop pancreatitis and, again, have the risk of death. Of those who develop the chronic recurring pancreatitis, many will form large cystic, fluid filled tumors of the pancreas as it gradually destroys itself. These tumors may become as large as a grapefruit.*¹³

Diabetes...Another function of the pancreas is to produce a chemical called *insulin*, an enzyme which is necessary for the transfer of sugar substances in the blood stream into stored energy and activated energy. When insufficient insulin is secreted, a condition called *diabetes*¹⁴ results.

Hyperglycemia...When an alcoholic beverage is consumed, the alcohol impedes the ability of the pancreas to produce sufficient insulin resulting in a higher blood sugar. Therefore, alcohol becomes an exceedingly dangerous substance for a diabetic. The condition is called *hyperglycemia*. In normal or social drinkers, ingestion of large amounts of alcohol may cause a mild, transient rise in blood sugar... probably because it initiates some stress response hormones, which release some glycogen from the liver.¹⁵

Hypoglycemia...The opposite condition from hyperglycemia is called *hypoglycemia*, or low blood-sugar. *The condition is characterized by symptoms that reflect the nervous system's deprivation of glucose: headache, mental dullness, confusion, and amnesia - and possible unconsciousness, seizures, coma, and death.*¹⁶

Hypoglycemia that is alcohol-induced is probably the more prevalent result of drinking among social drinkers. Several factors may initiate the condition. One is called *fasting* hypoglycemia. It is known that over 95% of the alcohol a person ingests is metabolized, or broken down, by the liver. While the liver is engaged in metabolizing the alcohol, a shift within the liver cells occurs that causes a virtual shutdown of the production of glucose. It occurs only as long as the liver is thus involved and is of no great concern so long as glycogen is available to maintain the blood sugar level. If the person has fasted for at least 24 hours or is engaged in a very low calory - carbohydrate diet, he or she will have used up most or all of the liver glycogen. Only a very minimal ingestion of alcohol can produce a B.A.C. of 0.10%, which is illegal intoxication in most states.

Children are particularly susceptible to this kind of hypoglycemia since glycogen supplies are depleted quickly. Death may occur in a child who has ingested alcohol even though the B.A.C. is below a 0.45%, the lethal level. It may result from usage of numerous commercial products in which alcohol is an ingredient: mouth washes, cologne, cough medicine, food flavoring, etc. Hypoglycemia should be suspected in any comatose or unarousable child, especially if alcohol - even a small amount - is known to have been ingested.¹⁷

A different set of circumstances in metabolism may activate another mechanism...alcohol may elicit a *reactive* hypoglycemia. The focus here is pointed at the alcohol consumed before or during a meal that is rich in carbohydrates producing a reactive hypoglycemia in as many as 20 percent of normal people. Beer, alone, supplies more than 37 grams of alcohol and 40 grams of carbohydrates.

What happens is simply that, in the presence of alcohol, the pancreas over-secretes insulin in response to the natural rise in blood sugar that follows eating. The normal drop in blood sugar described earlier becomes a precipitous plunge that produces hypoglycemic symptoms about 2 or 3 hours after eating. Even though some of the milder symptoms described for fasting hypoglycemia (headache, confusion, and dullness) may occur, a rapid decline in blood sugar such as this often first triggers a *stress response* by the autonomic nervous system. That is, adrenalin enters the blood stream, causing anxiety, perspiration, palpitation, and shakiness. The two sets of symptoms can combine to constitute a mid-martini lunch, although this hypoglycemia is less persistent and severe than that produced by drinking in a fasted state. *In this case, glycogen is available in the liver to restore a normal, albeit, delayed, glucose level.*¹⁸

The reader who recognizes personal symptoms such as noted above is encouraged to pursue further reading in the article cited and in similar research projects for hypoglycemic correlatives in physical dexterity, brain damage, hypothermia, and many associated effects.

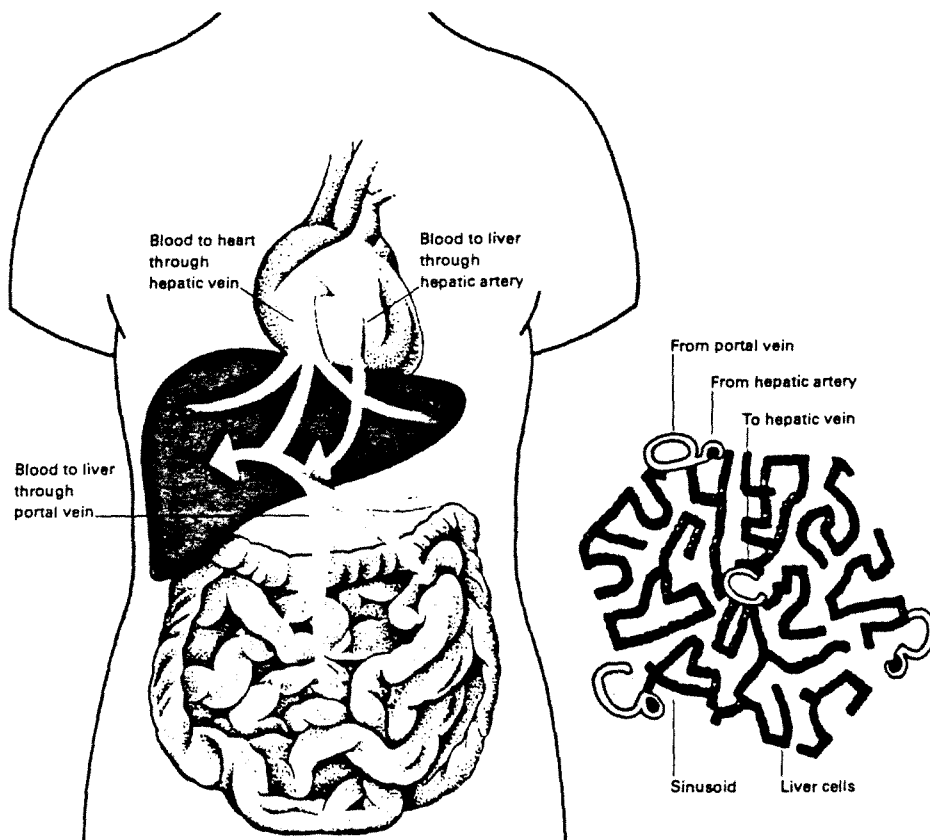
E. The Liver

The human liver is recognized as the largest internal glandular

organ of the body. Ancient writings associated much mystery with the liver, such as, the seat of the soul, the source of life, etc. Much of the mystique has faded away. Biologically, the liver maintains a central role because it is the body's chief chemical factory. It is essential to dozens of life processes. Advanced study of the liver has uncovered a whole roster of new medical concepts along with the recognition of numerous health hazards.

The liver, weighing about three pounds in an adult, lies mainly on the right side of the abdominal cavity. (Note the diagram below).¹⁹

Channels in the Liver Factory



All blood circulates in the liver, entering from the heart through the hepatic artery and from the small intestines through the portal vein, and afterwards exiting to the heart through the hepatic vein. Within the liver, the blood circulates in sinusoids, or spaces, formed by the interlacing liver cells. Here it deposits harmful wastes for disposal and picks up chemical substances produced by the liver.

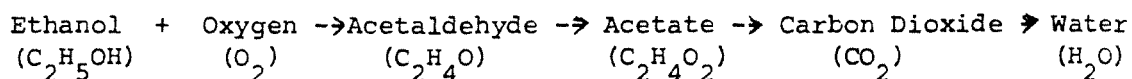
It functions as a storehouse of body nutrients. It neutralizes drugs and other chemical substances. Blood, loaded with nutrients and other substances absorbed in the small intestines, travels directly to the liver through the portal vein. Smaller veins then distribute the blood to individual liver cells for processing.

Liver cells function to process nutrients and manufacture enzymes in several ways:

They convert sugar from the diet into a starchlike carbohydrate, glycogen, which the liver then stores for ready release as glucose when the body needs energy. Liver cells also produce bile, which works in the small intestine neutralizing acids and breaking down fat. Liver cells use other nutrients in manufacturing vital blood proteins, such as serum albumin, serum globulin, and fibrinogen. And they also make cholesterol, which is essential for the production of sex hormones. In addition, liver cells store vitamin A and certain minerals that the body needs.

*One of the liver's most important functions is to inactivate or detoxify a wide variety of potentially harmful chemicals. The liver cells take such chemicals out of the circulation, and enzymes in the cells transform them into less toxic substances.*²⁰

Up to 95% of the alcohol ingested is metabolized in the liver (oxidized, changed, detoxified, burned, broken down). Chemically, the process of metabolism is as follows;



which simply and progressively pictures alcohol oxidized first into acetaldehyde, which then breaks down into some acetate, a salt or ester of acetic acid, and eventually into carbon dioxide and water.²¹

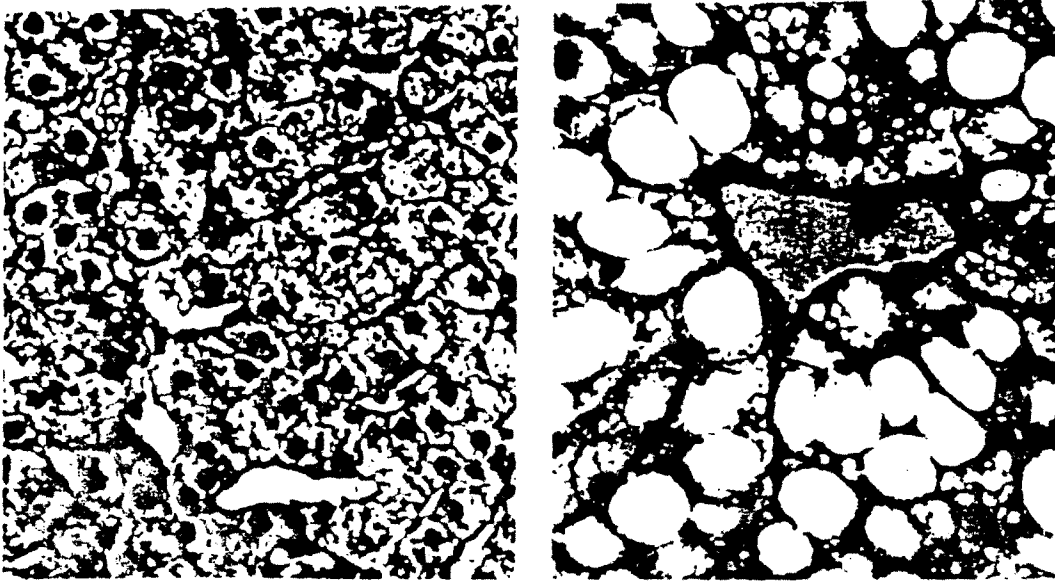
The enzyme action at the acetaldehyde stage may be blocked by the drug, Antabuse (Disulfiram) which prevents the acetaldehyde from breaking down. Acetaldehyde is a very nauseating substance to many people. Until a tolerance is established, vomiting may result. The liver in an average adult will burn about one-half ounce of pure ethanol per hour.

Both science and industry, with a multitude of social drinkers, have been searching for ways to speed up the rate. Exercise, oxygen, cold showers, and black coffee have been tried to no avail.

Although the action of alcohol on the brain in functional depression is the most evident and common of serious behavioral consequences, the liver is the center of the most deterioration and mortality among alcoholics.

An enlarged, fatty liver is the first stage due to accumulation of excess fat. Note the normal cell structure in the picture on page 53 on the left, and the large deposits of fat in the picture to the right.²²

A common observation in alcoholism from a heavy diet of beer is an unusually enlarged abdominal area, often referred to as a *beer belly*. The condition has little to do with the stomach. Rather, it is an excessively enlarged liver from the storage of fatty tissue. The liver in a beer alcoholic will swell to the equivalent of a seven to eight month pregnancy. However, both moderate and massive fatty liver are



Needle biopsy section of a healthy baboon's liver, *above*, enlarged about 300 times, has none of the fat globules, *above right*, found in the same animal's liver after 15 months of heavy alcohol consumption.

reversible, usually, when rehabilitation has been successful.

The liver was identified earlier as a glandular organ. It secretes several very essential chemicals or enzymes. One of those enzymes is called *albumin*. It looks like the white of an egg. Albumin is necessary to maintain the health of each cell in the body. When insufficient albumin is secreted, the cells begin to disintegrate and release the fluids from muscle cells, brain cells, heart cells - every cell in the body. When liver tissue is destroyed by alcohol, the supply of albumin is diminished and all the cells are denied an adequate supply of albumin.

Another chemical produced by the liver is *globulin*. It helps the body ward off infection by maintaining the immune system. When the globulin supply is lowered by alcohol-induced deterioration, the body has increased infection and general health problems.

The last liver enzyme noted for this study is called *prothrombin*.

It has a vital function in the blood-clotting process.

In this regard, it is necessary to clarify the relationship of the blood and its cells. Blood cells are generated by the bone marrow. The normal life of a red cell is approximately 120 days. When the cell dies, it is filtered out of the blood by the liver and is excreted in the *bile*. Thus, the liver cleanses the blood of dead cells and removes a blood stoppage risk. The bile produces the brownish color to the stool.

The red cells in the blood carry oxygen and remove carbon dioxide. The white cells fight disease and infection. The platelets are cells that clot the blood. They use the prothrombin secreted by the liver to accomplish the task. *Three drinks in one day will destroy all the platelets that the bone marrow can manufacture in one day.*²³ Alcohol impedes both the ability of the liver to secrete the prothrombin utilized by the platelets to clot the blood. Thus, a basal dilation condition is generated along with weakened cell walls in the circulatory system that results in internal hemorrhaging. In alcoholics, that condition is recognized in blood-shot eyes, a red nose, and a highly flushed face. Internal hemorrhage is common throughout the body.

F. The Heart and Circulatory System

For many years the heart was recognized as the critical point between life and death. When the heart beat was no longer detected, the person was declared dead. In more recent cases, both the heart beat and brain wave are vital for signs of life.

Each day in the United States, approximately 1,400 people die from heart attacks. New technology in surgery with increased knowledge of

what causes heart attacks promises new hope to reduce that high toll. If it were possible to address the full role of alcohol's toxicity on the heart tissue, the high heart attack toll might be lowered rapidly.

1. Alcohol's Effect on Heart Structure

A brief review of structure and function is necessary for a better understanding of alcohol's effects on the organ and its work.

The heart operates as a four-chambered, muscular pump. It has two chambers, the *atria* which serve as collection chambers, and the other two *ventricles* which serve as pumping chambers. When the heart pumps the blood through the lungs where it receives oxygen, the reoxygenated blood returns to the left atrium where it is pumped throughout the body by contraction of the left ventricle. (See the chart on page 56 for a pictorial description of the operation of the heart.) Valves control the flow of blood through the heart.²⁴

The heart pumps blood to other parts of the body, but in addition, the heart muscles must receive nourishment. Blood flows to the heart muscles through the coronary arteries that lie over the walls of the heart.²⁵ The arteries are so named because they rest over the heart's surface like a *corona* or a crown.

The heart is about the size of a fist. An average adult heart is about five inches long, three and a half inches wide, and two and a half inches thick. A man's heart weighs about eleven ounces, and a woman's, about nine ounces. The heart beats an average of 72 times a minute, or 103,680 times a day. During the day,

The Circulatory System of the Heart

The nourishment of the heart muscle is effected by its own circulatory system. The coronary arteries (red) carrying oxygenated blood branch off from the aorta and then divide into smaller vessels to reach all parts of the heart. The cardiac veins (blue) return the blood to the right atrium where it mingles with the blood returning from the rest of the body.

Superior vena cava

Aorta

Pulmonary artery

Left atrium

Anterior cardiac vein

Right atrium

Coronary sinus

Small cardiac vein

Right coronary artery

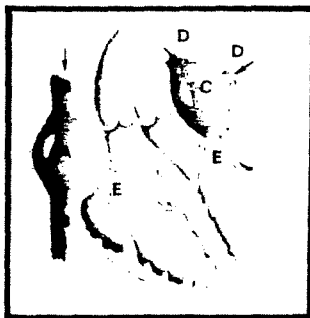
Left coronary artery

Great cardiac vein

Middle cardiac vein

Inferior vena cava

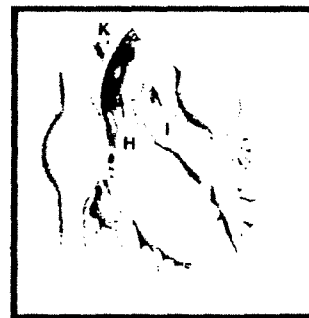
(Interior arteries and veins are shown in lighter shades)



Blood returned from the body enters the right atrium (A) by way of the inferior and superior venae cavae (B). At the same time, left atrium (C) fills with oxygenated blood returned from the lungs by the pulmonary veins (D). The A-V valves (E) are open.



At the start of the cycle, the atria contract, sending venous blood into the right ventricle (F), and oxygenated blood into the left ventricle (G). When the filled ventricles contract, the A-V valves close to prevent blood from flowing back.



The pulmonic (H) and aortic (I) valves have opened and the A-V valves have closed. The ventricles contract, blood flows to the lungs by way of the pulmonary artery (J) and oxygenated blood through the aorta (K) to the other parts of the body.

it will pump about 7,200 quarts of blood through its chambers. The volume of blood is the equivalent of thirty-five--fifty gallon barrels per day, or approximately one and a half barrels an hour.

When alcohol is introduced into the human systems, every cell and tissue is impacted, though in varying degrees the result of many interacting forces. The impact is caused, principally, by the physical properties that identify the drug and the service potential given to the cell by the parallel systems. A very prominent effect is called *myocarditis* or *cardiomyopathy*.

*Once in question, there is now no doubt that in addition to fatty infiltration, alcohol causes heart damage even when malnutrition or lipeds are not a factor. Likewise, that even moderate amounts of alcohol can stress the myocardium, or heart muscle. Even one drink has been shown to diminish myocardial contractility. High blood pressure often drops to normal when drinking stops. Binge drinking followed by strenuous exercise can be fatal even to young people...there is enough evidence to yield a consensus that alcohol, and especially prolonged heavy drinking, is a significant cause of congestive heart failure, enlarged heart, elevated diastolic blood pressure, peripheral edema (swelling) and myocarditis.*²⁶

Both historical fiction and fact recount numerous occasions when doctors prescribed alcohol as a mild tranquilizer, a cathartic (to cleanse), and an anesthetic for surgical purposes. On many occasions it was the only chemical available for such purposes.

There are some physicians who utilize it as a mild sedative for heart trouble. *Today's knowledge dictates that even small amounts of alcohol may be harmful to a person with any kind of heart disease.*²⁷ The alcohol will increase the amount of fat (cholesterol and triglycerides) in the body and blood stream. Also, it will increase the work load of the heart to over work and inflame the heart muscle. Changes are evident on the electrocardiogram - lowering voltage and heart beat irregularities. Alcohol is a common cause of high blood pressure, often overlooked when a hypertensive patient is studied. Synergism, a condition created when alcohol is mixed with other drugs or medications, will have a notable effect on the heart and hypertension.²⁸

The reader is referred to the extensive work of Dr. Max Schneider in the publications cited for additional information relative to the effects of alcohol on the organs and systems of the body.

2. Alcohol's Effect on Heart Function

While the heart constitutes the primary organ of the circulatory system, the entire system is a marvel by itself.

The blood is a most amazing substance. While circulating in the system it must be a liquid. If the system is opened in any way, the blood must clot. If the blood does not clot, a hemorrhage will occur. If a clot occurs in the closed system, serious consequences will follow. A clot in an appendage (arm or leg) may result in gangrene. A clot in either or both of the common carotids supplying blood to the brain will cause instant

death.

The blood in a normal system weighs a little over seven pounds for every hundred pounds of body weight.

The five to six quarts of the liquid part of blood are sustained by drawing from the water content of the body which is about ninety percent water.

About 250,000,000 cells in the blood die and are replaced every day. The cells constitute about half of the blood. The cells are so small that about 60,000 of them could rest on the head of a pin. The red cells carry oxygen to the cells and pick up waste gases, *carbon dioxide* from the tissues for discharge in the respiratory system. The white cells fight infection and disease. The platelets are utilized to clot the blood.

The pulmonary system circulates the blood through the lungs to replenish the oxygen and remove gases. The systemic system services the rest of the body. Average circulation time is approximately every twenty-two to twenty-five seconds. Any factor or condition that intercepts or diminishes that service schedule may create serious problems.

A research project conducted by Dr. Melvin H. Knisely, a cardiologist and Professor of Anatomy at the Medical University of Charleston, South Carolina, with his associates Drs., Herbert A. Moskow and Raymond C. Pennington, focused on the subject of agglutination. Their findings were published first in the medical periodical *Microvascular Research*. The contribution of their research is significant to the medical study of alcoholism relative

to the widespread theory that drinking in moderation is harmless.²⁹

A condition that is directly related to the function of the circulatory system when alcohol is present is called *agglutination*.

Agglutination, simply defined, means that the cells in the blood become sticky and actually sludge or adhere to each other while the alcohol is present. The sludging slows down the delivery of oxygen in the bloodstream and creates another condition called *anoxia* (lowered or absence of oxygen). Oxygen is delivered to the cells of the body only by way of the blood. Thus, it may be said that alcohol forcibly denies oxygen to nerve cells causing them to, first, go to sleep and, if sustained over a period of time, the oxygen-starved cells will suffocate and die. Permanent damage is recorded in organs and tissues that cannot be repaired or replaced. For example, an advanced chronic alcoholic, judicially classified as mentally insane, may be assigned to a state mental institution in the alcoholism ward. Previously, the brain cells, which had been anesthetized while under the influence, have been destroyed. He appears and acts *drunk* while completely sober. He can no longer function normally in society because there is no repair or replacement possible for the cells destroyed. He will be a resident of the state institution the balance of his *abnormal* life. Agglutination and anoxia in the circulatory system contributed heavily to the alcoholic condition.

The film produced utilizing the research of Dr. Knisely entitled "Just One" presents the filming of circulation as seen in the white of the eye in humans and in the abdominal area of

rabbits after alcohol was introduced into the circulatory system.

Just One depicts the circulation of blood in the following stages:

- (1) *Normal*...as observed in the circulation of a person in whom no alcohol had been consumed.
- (2) *Social drinking*...as observed in the circulation after several drinks registering a 0.10% to a 0.20%, or drunk by code.
- (3) *The Hangover*...the day after the subject had received three drinks over a four-hour period from 8 A.M. to 12 P.M. the evening before. The next morning after breakfast the filming was conducted. The body was detoxified by 2 A.M. or 3 A.M. There was no measurable alcohol. Nevertheless, a distinct sludging of the blood was evident. A considerable amount of time is required to bring the blood back to normal consistency after the alcohol has been detoxified. The hangover expresses the experience of headache and depression during the period of repair. While everyone who consumes experiences a bio-chemical hangover, not everyone feels the hangover. Some individuals possess a very high tolerance for pain. Others have a very low tolerance. The headache, alone, may serve as sufficient motivation to consume another drink to re-anesthetize the brain to eliminate the pain, a practice which may develop into compulsive-excessive consumption and addiction.

- (4) *The alcoholic*...filming the dissection of the brain of an alcoholic who was killed in an accident. The man, forty-four years of age, had been drinking for twenty years, developing an alcoholic life style. At the time of the accident he was D.W.I. with a 0.30% B.A.C. He was drunk. Having lost control of his car, blocking the right-of-way, he had removed himself from the car and was standing beside it. While watching another car approach that would hit his car, he backed away from his vehicle, lost his balance, and fell backward into the ditch. The coroner identified a mild concussion that resulted in a massive intra-cranial hemorrhage to cause his death. He died a slow death enroute to the hospital. The hemorrhage evident in the dissection was that which is observed in the body of a living alcoholic with blood shot eyes, flushed face, and red nose. The hemorrhage is prevalent all over the body. The coroner observed, that in his judgment, if the man were not an alcoholic, he would not have bled to death internally. It was the deteriorated condition of the cell walls in the circulatory system that permitted the massive hemorrhage.
- (5) *Unconscious*...the film pictures the circulatory system of a rabbit, a very close parallel to the human system. In time-sequenced periods, alcohol is introduced into the digestive system of the rabbit and filmed in the abdominal area. With increased dosage, the B.A.C. eventually

reaches a 0.40% level with unconsciousness. The agglutinated blood has effectively lowered the available oxygen to a level that will not support consciousness. A very small amount of an additional dose would have resulted in death. The very narrow margin between unconsciousness and death is comparable to the threshold for surgery. Death, toxic poisoning, occurs in the B.A.C. range from 0.45% and up.

The research conducted by Dr. Melvin Knisely has been noted for the claim that *brain damage starts with the first drink*. Or, another way of stating the same truth is that, *every time an individual consumes an alcoholic beverage, he dies a little*.³⁰ From that point of beginning, the ultimate bio-chemical effect on body function and structure will be determined by *volume* and *frequency* of ingestion.

G. The Brain and Nervous System

It is readily observed that the large role of alcohol's effects on the heart and circulatory systems are extended and, in some instances, expanded in the brain and nervous system.

While chapter three of the study presented some of the basic physiological factors relative to the brain and nervous system structure and function, the study will examine and note some basic areas of alcoholic effects on the brain and nervous system.

1. Alcohol's Effect on Brain Structure

The brain is the center of all mental activities. It is recognized as the most vital organ to distinguish man from all

other animal life. Often, the brain has been compared with a huge telephone switchboard, except that no switchboard could hope to duplicate the vast number of brain connections.

The *cerebrum* is the part of the brain that distinguishes man from animals. It is the largest part of the brain and consists of about 85 percent of the total brain weight.

*Two factors affect the use of the brain. One is heredity. The other is the influence of the environment. They are both important. Science has shown that there are little differences among the brains found among the different races of mankind.*³¹

Medical science has identified many diseases that attack the brain and nervous system and has achieved varying degrees of success in treating them.

*Disease in the brain...is different from disease that may affect other parts of the body. If a small area of the skin is wounded, new skin may form. But if nerve cells are destroyed, they are destroyed permanently. They will never grow back.*³²

A few giants have crossed the horizon of medical and technological research in the field of alcohol and neurological effects. One of those men is Dr. Cyril B. Courville, Neuropathologist at the Los Angeles County Hospital and Professor of Nervous Diseases at the College of Medical Evangelists in Los Angeles, California. The writer had the high experience of meeting and studying under Dr. Courville's instruction in 1968 and 1969 at the Loma Linda Studies on Alcoholism.

Dr. Courville's extensive documentations of cellular or structural damage to brain structure are still heralded in the field.

While serving many years as the resident neuropathologist with the Los Angeles coroner, he observed many evidences of extensive damage to the cerebral cortex in acute alcoholism cases.

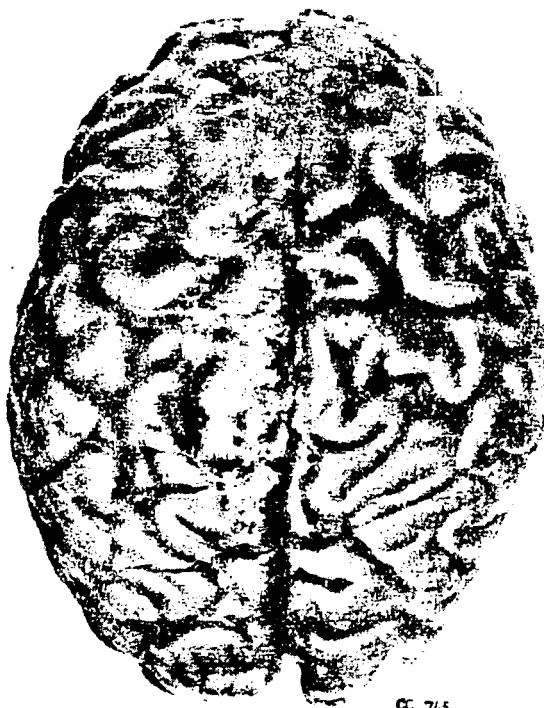
Among his publications he records

certain chronic

variants in the form

*of a pigmentary atrophy and a progressive deterioration of the medium sized cells of the middle cortical laminal. This latter change is characterized by a relatively slow deterioration... resulting in a process that seems to be the cause of patchy loss of nerve cells.*³³

The loss of groups of nerve cells seems to be a fairly common form of reaction by the brain to noxious substances, of



Atrophy of the frontal cortex as a consequence of chronic alcoholism. C.C. 745. Attendant thickening with opacity of the leptomeninges is evident over left hemisphere.

which alcohol is most often noted in Dr. Courville's findings.

The nerve cells of the basal ganglia (especially the corpus striatum) may also be severely damaged and many of these cells may be missing.

A degeneration of the myelinated fibers of the cerebral hemisphere in this condition has long been recognized, an observation confirmed by several students of the problem. This change is most evident in the tangential and radiating fibers of the cortex as observed in the myelin sheath preparations...Vascular changes in the form of swelling and proliferative changes of the endothelial cells and the presence of fat, as well as acute congestion and pericapillary hemorrhages are not uncommon, suggesting the association of hemorrhagic encephalitis.

The Purkinje cells of the cerebellar cortex also show loss of tigroid substance, shrinkage and darker coloration of their cytoplasm and nucleus or progressive deterioration leading to loss of these cells.³⁴

Again, the reader who is interested in extended study of the technological character of Dr. Courville's research and evidence pertaining to alcohol's effects on the brain is encouraged to pursue that interest in the work cited.

A study conducted by Baltimore's Montebello Center Spinal Cord Unit is of major significance for the fact that 62% of their traumatic spinal cord injury patients were identified as having alcohol-related injuries.³⁵ The claim of the research study team

noted that their study was the first published report linking alcoholism to spinal cord injury.

The study was undertaken to determine the relationship of alcohol to the causes of spinal cord injury; the effects of continued use of alcohol after injury, both during treatment and during leaves of absence from the center; and the effects of alcohol on short and long term rehabilitation goals.

While the bulk of the study's returns dealt with functional aspects of alcohols effects, it is essential to note that, for an alcohol induced injury to the spinal cord (while the person was under the influence of an alcoholic beverage) that precipitated a paraplegic or a quadriplegic condition, *there is no realistic hope of "cure"*.³⁶ One of the most difficult aspects of the study to handle was for family members as well as patients to confront and adapt to both the physical and psychological impact of injury. Coping was complicated by guilt feelings from family members and the injured as a result of perceived failure to protect a loved one from harm, for unacceptable feelings of anger toward the disabled person whose self-destructive act left other family members burdened with new and restrictive roles, decreased income, and many other problems.

The conclusion of their study indicated a need for extended alcohol education, not only for the patient but for society in general, to the extent that the effects on society and families of continued alcohol use by spinal cord injured patients are devastating both economically and emotionally.

The fact of permanent brain damage in addition to the normal loss of brain cells, which all experience in the aging process but accelerated by ingestion of alcohol, has been a matter of record for a long time.

It has long been known that alcoholics have permanent brain damage. Dead nerve cells never regenerate, so damage is irreversible. The electron microscope has revealed details of cell damage, and gross brain shrinkage is observed in postmortem examinations, by pneumoencephalogram (X ray of skull after replacing cerebrospinal fluid with air), by computerized brain scan, by changes in brain-wave patterns as measured on the electro encephalogram (EEG), and by psychological tests of mental function designed to measure brain damage. One medical school professor is reported to have refused to accept cadavers of transients picked up by police because the brains were so deteriorated as not to be representative of the human brain he wanted his pupils to study.³⁷

While it was once thought that most damage to the brain was the result of malnutrition, and specifically avitaminosis, new evidence indicates that alcohol, itself, causes brain damage.

2. Alcohol's Effect on Brain Function

Under this heading, the writer proposes to mention a few illustrative areas of alcohol's effect on brain *function*. The remaining chapters of the study will detail more of the practical areas in which the functional effect is seen in the designated

phases of our corporate life.

Alcohol impairs the ability of the brain to send or transmit messages through the nervous system.

*Many scientists believe that some neurotransmitters control or moderate emotional states such as calm, optimism, anxiety, or depression. The continued use of alcohol or opiates may turn off the production of certain neurotransmitters by a complex feedback system. For example, alcohol may enhance the power of the neurotransmitter gamma-aminobutyric acid (GABA) to inhibit anxiety. Continued heavy drinking may lead to decreased production of GABA. Then, when the drinking stops, the body may be depleted of the transmitters, leading to acute withdrawal. It is also possible that these emotional control systems do not return to normal for long periods of time, leading to protracted withdrawal.*³⁸

The capacity for alcohol in the release of its physical properties to impair and create disorder is observed in every system of the body. *The neurological and psychiatric disorders that appear during alcohol withdrawal are only part of the medical cost of excessive drinking. Its misuse is related to a bewildering number of afflictions, including heart attacks and cancer, muscle deterioration, and anemia.*³⁹

A large part of alcohol's effect on the brain's functional capacity is temporary in nature and duration. It will be evident only while the individual is under the influence of the drug. Patients often testify that after a drinking bout they experience

anxious and depressed feelings, which is quite ironic in view of the fact that many drink in an attempt or for the purpose to escape anxiety and depression.

The chart on page 71 describes many of the functional activities influenced by the effects of alcohol.⁴⁰

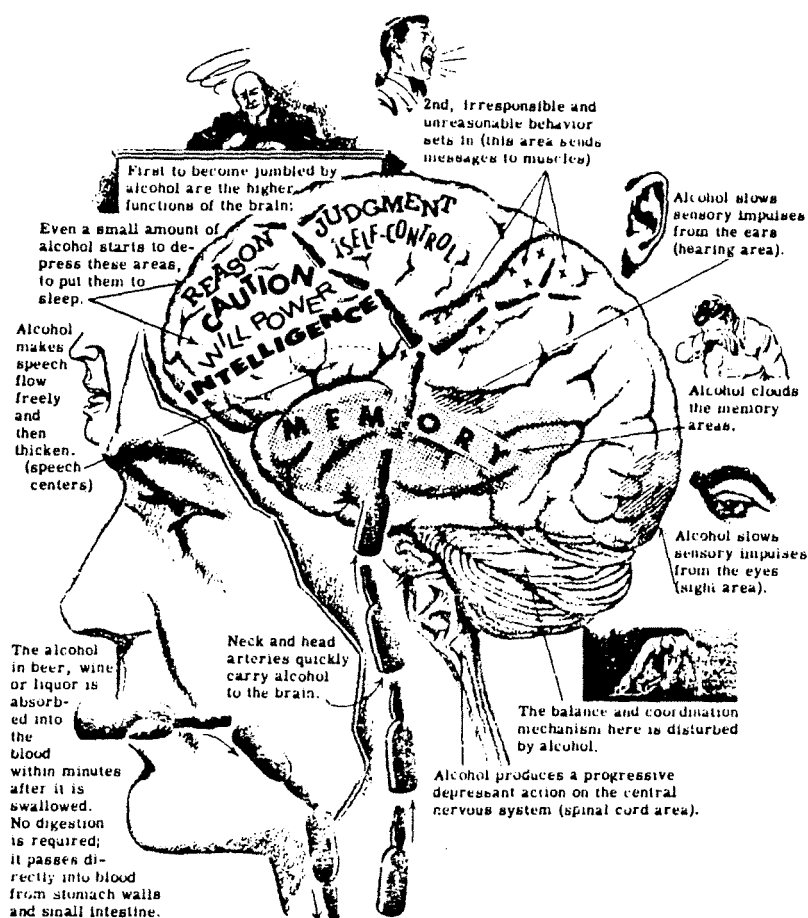
The brain is by far the most important organ through which alcohol affects behavior. Nerve action requires energy from oxidizing glucose, with the aid of the enzyme Adenosine Tri-Phosphate (ATP). Alcohol interferes with the supply of oxygen to the brain, decreasing the use of oxygen by the brain cells as much as 30 percent at 0.30% B.A.C., and 60 to 80% at 0.50% B.A.C. Even at blood levels of 0.10% to 0.20%, alcohol diminishes notably the ATP action.

*In addition, alcohol interferes with the production and functioning of a host of substances in the brain whose role and even existence research is still discovering, going by such names as endorphins, enkephalins, biogenic amines, neuro-hormones, catecholamines, etc.*⁴¹

Sleep disturbances are very common to those who consume socially. Some will go to sleep quite easily after ingestion only to wake up early and be unable to lapse into sleep again.

Blackouts are a memory loss associated with the frontal lobe of the brain. They should not be associated or confused with the *dead drunk* experience. The dead drunk experience relates to the function of the cerebellum. Therefore, two entirely different centers of the brain are involved and two levels of consumption

are normally involved. The blackout (memory loss) may be extended over a long period of time and even permanently while the dead drunk will regain consciousness after detoxification.



Hallucination may be visual, auditory, or mixed. It is important to distinguish between hallucinations and delirium tremens. Hallucinosis usually is experienced during the first thirty-six hours of withdrawal. While it may involve a mild disorientation in time, the patient will converse intelligently. Delirium tremens is the most severe of the withdrawal state peaking after about three days of abstinence, and may recur several

days later. Webster defines delirium tremens as *a violent mental disturbance with tremors that is induced by excessive and prolonged use of alcoholic liquors.*

Peripheral neuropathy usually begins with pain in the calf muscles, associated with a tingling or burning sensation and numbness in the feet and lower extremities, and eventually in the hands and arms. It is usually most common in malnourished alcoholics. The symptoms disappear with abstinence, a good diet, and B vitamins.

An expression is often heard among beginning drinkers. "Well, its my body and I ought to be able to do anything I want as long as I don't hurt anyone else!" A recent article in the Seattle Times of 4-2-84 addressed the statement with the following:

- (1) For an under age person, drinking is illegal.
- (2) Those under the influence create a public nuisance, disturb the peace, hurt themselves and require medical attention, and imperil the life of others while they are under the influence.
- (3) There is increasing evidence that those under the influence commit crimes they would not commit if they were alcohol-free.
- (4) If addiction occurs, is the addict prepared to pay for treatment or expect society to pay for the "victimless crime"?

CHAPTER FIVE

ALCOHOL AND SOCIETY

From the dawn of recorded history alcohol has played a distinct role. The opinions of writers on the subject vary greatly. Even professionals in the field of alcoholism treatment manifest broad areas of disagreement on basic concepts to the propriety of specific types of treatment. Acceptance of and resistance to alcoholic beverages evidenced vacillating periods of ups and downs.

A major change was recorded in December of 1919 when ninety-five percent of the land and two thirds of the population were legally dry. Eventually, passage of the eighteenth Amendment to the U. S. Constitution was recorded on January 16, 1920. It was implemented by the Volstead Act on October 20 of the same year. The Act prohibited the manufacture, sale, or transportation of any intoxicating beverage except for medicinal or sacramental purposes. The Act was repealed on April 7, 1933.

Since that time a major struggle has ensued between the law, authorities, and the people. The reality of many and varied attitudes keeps the struggle alive today.

I. SOCIOLOGICAL ASPECTS

The total impact of alcohol on our society and the people that make

up that society is beyond total comprehension. Authorities and specialists in the field have made numerous attempts to ascribe a basic analysis. Satisfaction and resolution of the problem have evaded reality to the present day. For the limited purpose of this study, four sociological aspects will be considered: A. Definition of Alcoholism, B. Disease Concept, C. Consumption, and D. Addiction.

A. Definition of Alcoholism

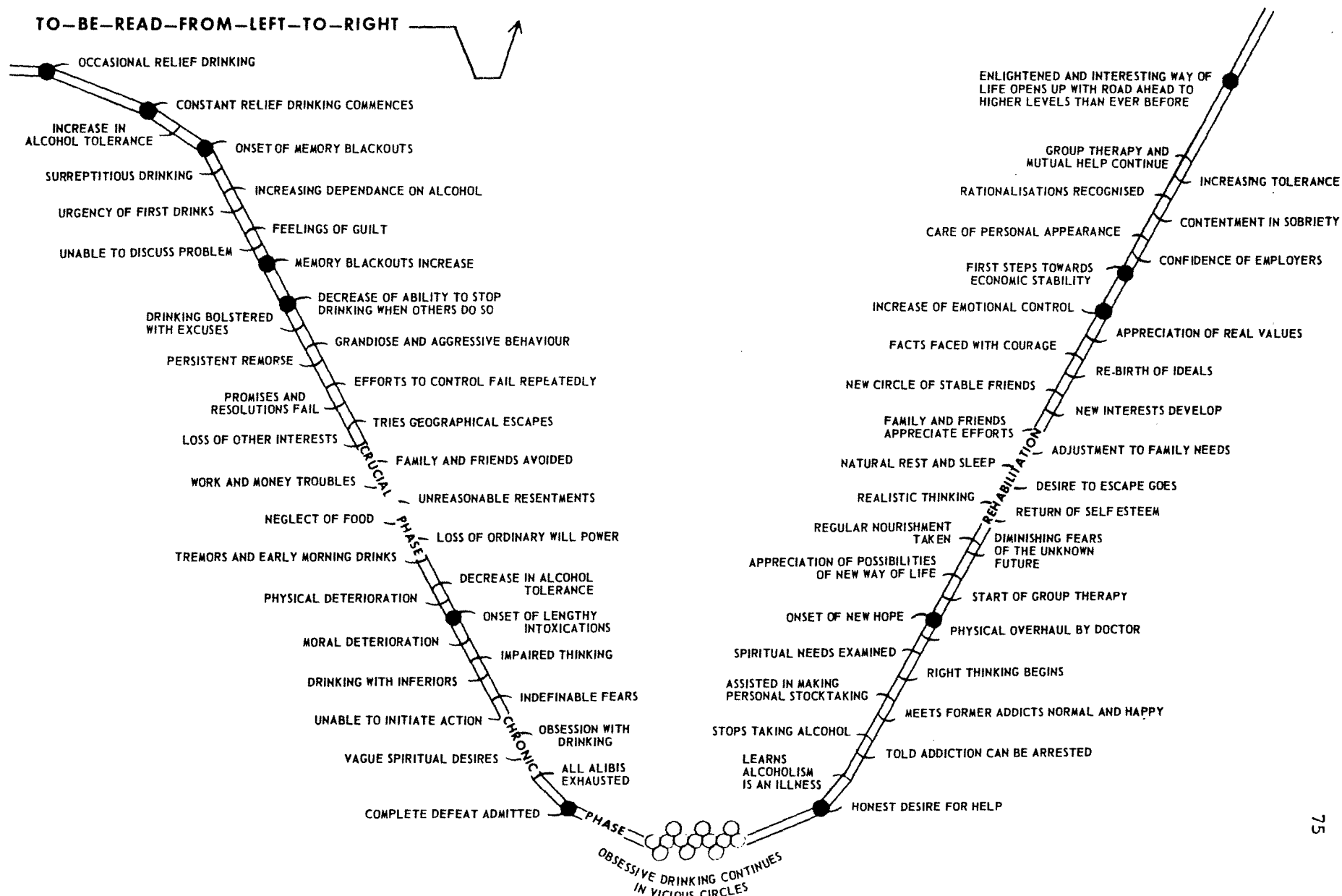
On the next page the reader will observe the standard Alcoholism Addiction and Recovery Chart. The chart has received broad acceptance as reflecting many commonly experienced stages in the alcohol addiction syndrome.

The personal preference of the writer relative to a definition of *social drinking* is as follows. Control drinking is the key word. The individual who drinks makes a rational decision *when* to drink, *how much* to drink, and *when* to stop drinking.

While there are many philosophies as to why some people lose *control* to become alcoholics, the writer, again, focuses on one factor that is very prominent in the fall-out of control which leads to addiction. The factor is *tolerance*.

Tolerance is readily illustrated in the medical field. The patient receives a prescription from the doctor to treat an illness. The druggist fills the prescription and places the instruction for the prescription on the label. The patient is to follow the directions. However, the patient soon finds that the specific dosage does not provide the original effect. Therefore, while the doctor prescribed one pill every four hours, the patient now takes two pills every

SOCIAL DRINKING = CONTROL DRINKING... WHEN TO DRINK - HOW MUCH - WHEN TO STOP



A CHART OF ALCOHOL ADDICTION AND RECOVERY

four hours. With the supply exhausted, the patient seeks a refill only to find that the druggist is unable to refill the prescription by the regulations of the Federal Food and Drug Administration. The patient returns to the doctor who wants to know, "What has happened?" The patient has moved, in effect, from the patient role to the doctor role. He prescribes his own drug.

The illustration is closely paralleled in a social drinker. After an exceptionally bad day at work, the subject is filled with tension and feelings of hostility. He must come down. The solution...a drink at the favorite licensed outlet, or, a quick trip home where a favorite drink is cooled and waiting. However, after repeated experiences of that nature, one will not satisfy. Now two drinks are required. Soon, a drink before work is scheduled and then a mid-day drink. The subject has fallen out of control and accelerated both *volume* and *frequency* of ingestion. Those two factors parallel physiological and psychological conditioning or addiction.

On the addiction chart, an average adult male requires approximately fourteen to seventeen years from the fall-out of control to arrive at chronic addiction (alcoholism). An average adult female moves down the same course in six to eight years - a teen in four to five years. The younger the subject begins to drink and lose control the faster the digression. A baby born of a drinking mother is born malformed and malfunctioning in direct proportion to the volume and frequency of ingestion by the mother. If the mother is a practicing alcoholic during the pregnancy - comes to the hospital for delivery and is drunk - the baby will be born drunk. (see the section on "Family

Living" for more detail on the Fetal Alcohol Syndrome). The baby will detoxify, first. Then, withdrawal will follow. It is called "cold-turkey," without the kind of medical assistance received by an adult in a standard rehabilitation program. Monitoring of the vital signs is imperative. Under the influence of other drugs, that monitoring may be jeopardized and the life of the baby imperiled. The baby may be born an addict - physiologically paralleling the mother's addiction. Physiological addiction is not genetic addiction which is inherited. A child with that kind of addiction will never drink socially. A rapid digression into addictive consumption will soon follow initial ingestion as an adult.

Many chronically addicted alcoholics never achieve rehabilitation but die twelve to fifteen years earlier than if that person had never become an alcoholic. A *recovering alcoholic* must live a total abstinent life. The genius of the Alcoholic's Anonymous program prescribes one day at a time.

Professional treatises on alcoholism present many excellent definitions of addiction. James E. Royce, Seattle University, defines it as follows:

*We define alcoholism as a chronic illness or disorder characterized by some loss of control over drinking, with habituation or addiction to the drug alcohol, or causing interference in any major life function: for example, health, job, family, friends, or the law.*¹

Dr. Royce amplifies his definition by distinguishing between primary and secondary alcoholism as well as the alcoholic drinker

versus the problem drinker. The reader is encouraged to review the full treatment of the subject in the work cited in addition to other excellent resources in the bibliography.

B. Disease Concept

The disease concept of alcoholism, a theory, records many up's and down's before it achieved legal status in the Uniform Act. Some major advances were recorded during the time when Dr. E. M. Jellinek developed and established his definition and formula for chronic alcoholism.

However, when hopes were running high, in the 1968 case of Powell vs. Texas, the U. S. Supreme Court ruled, in a close five to four decision, that it is not unconstitutional to jail an alcoholic. Justice White concurred but wrote a separate opinion in which he indicated that, except for some legal technicalities, he would have voted in the affirmative and would have reversed the decision. The court said,

The inescapable fact is that there is no agreement among members of the medical profession about what it means to say that "alcoholism" is a "disease"...There is no agreement among doctors and social workers on the cause of alcoholism, there is no consensus as to why certain treatments work in certain cases, and facilities for treating impoverished alcoholics are woefully lacking throughout the country.²

The majority opinion in Powell vs. Texas suggested that the concept was too narrow. It did not imply rejection of the concept, but suggested further research and refinement.

Eventually, in 1971 the National Conference of Commissioners on Uniform State Laws adopted the Uniform Alcoholism and Intoxication Treatment Act. Application of the Act has had the effect of taking alcoholism out of the drunk tank and the criminal justice system, making the alcoholic a sick person rather than a criminal.

While the writer does not fully concur with the disease concept, it has served to bring many practicing alcoholics out of hiding and into a treatment program. If for no other reason, it has been profitable in that area.

However, the disease concept, also, has provided an opportunity for some alcoholics to rationalize and justify continued consumption because they are sick.

There is no question or debate relative to the fact that a practicing alcoholic is sick: mentally, physically, psychologically, emotionally, and in just about every area of life possible.

Nevertheless, there is no effective counter argument to the fact that, except for the first drink, the eventual physiological, psychological, or genetic addict would never develop that potential. The first drink must be a rational decision unless the subject were already sick by some other qualification.

It is possible, also, that a social drinker may not live long enough to become an alcoholic. The subject may become a fatality victim while under the influence of an alcoholic beverage. Traffic safety will be discussed later in this chapter.

C. Consumption

Alcohol is alcohol, no matter where it is found or in what form.

At least that has been the traditional approach in some forms of alcohol education, warning potential drinkers that it can be just as dangerous to ingest beer or wine as it is for hard liquor.

An article on the subject of mixing drugs published in The Bottom Line claimed that,

*Combining large doses of caffeine with heavy cigarette smoking, both stimulants, may cause people to consume more alcohol, a depressant, said Robert Borgman, a Clemson University food scientist who studied two hundred and fifty problem drinkers over two years...Using all three substances could be a factor in turning a problem drinker into an alcoholic.*³

Per capita alcohol consumption figures have vacillated through the years. The rates of consumption have been influenced by economics, custom, tradition, law, and a host of other forces.

A recent article in the U. S. Journal Of Drug And Alcohol Dependence stated that the District of Columbia has taken the number one position in terms of per capita consumption as calculated from sales and taxation data for the year 1982.⁴

The previous consumption leader was the State of Nevada, which experienced a sharp reduction in their volume of consumption.

The 1982 Per Capita Consumption chart pictured on page 81 reveals that alcohol consumption varies drastically from one state to another.

The data was released by the Alcohol Epidemiological Data System, under contract to the National Institute on Alcohol Abuse and Alcoholism. Data is based on sales and tax collections. It does not reflect

1982 U.S. APPARENT PER CAPITA CONSUMPTION IN GALLONS OF ABSOLUTE ALCOHOL

	Spirits	Wine	Beer	Total	Rank
Alabama	0.72	0.18	1.00	1.90	48
Alaska	1.74	0.56	1.75	4.05	4
Arizona	0.99	0.40	1.74	3.13	14
Arkansas	0.63	0.12	1.03	1.78	50
California	1.14	0.72	1.37	3.23	11
Colorado	1.18	0.46	1.64	3.28	7
Connecticut	1.20	0.49	1.04	2.73	28
Delaware	1.36	0.34	1.53	3.23	11
D.C.	2.91	1.00	1.48	5.39	1
Florida	1.33	0.40	1.56	3.29	6
Georgia	1.04	0.21	1.12	2.37	37
Hawaii	1.14	0.48	1.80	3.42	5
Idaho	0.82	0.31	1.47	2.60	31
Illinois	1.06	0.35	1.41	2.82	22
Indiana	0.76	0.18	1.29	2.23	40
Iowa	0.65	0.13	1.39	2.17	43
Kansas	0.67	0.13	1.22	2.02	42
Kentucky	0.73	0.12	1.14	1.99	46
Louisiana	1.00	0.30	1.49	2.79	24
Maine	1.02	0.30	1.30	2.62	30
Maryland	1.17	0.32	1.27	2.76	25
Massachusetts	1.22	0.49	1.35	3.06	15
Michigan	0.98	0.39	1.35	2.72	29
Minnesota	1.11	0.27	1.36	2.74	26
Mississippi	0.82	0.11	1.18	2.11	44
Missouri	0.79	0.21	1.38	2.38	36
Montana	1.02	0.32	1.82	3.16	13
Nebraska	0.58	0.28	1.50	2.36	38
Nevada	2.50	0.77	1.99	5.26	2
New Hampshire	2.34	0.58	1.89	4.81	3
New Jersey	1.13	0.52	1.22	2.87	18
New Mexico	0.94	0.34	1.72	3.00	16
New York	1.0	0.48	1.26	2.84	20
North Carolina	0.85	0.21	1.07	2.13	45
North Dakota	1.10	0.18	1.52	2.80	23
Ohio	0.66	0.22	1.40	2.28	39
Oklahoma	0.83	0.16	1.17	2.16	41
Oregon	0.88	0.53	1.33	2.74	36
Pennsylvania	0.70	0.23	1.67	2.60	31
Rhode Island	1.04	0.55	1.34	2.93	17
South Carolina	1.00	0.20	1.24	2.44	35
South Dakota	0.98	0.18	1.29	2.45	34
Tennessee	0.70	0.14	1.13	1.97	47
Texas	0.84	0.18	1.83	2.85	19
Utah	0.55	0.15	1.01	1.71	51
Vermont	1.25	0.50	1.49	3.24	10
Virginia	0.86	0.27	1.45	2.58	33
Washington	0.99	0.52	1.33	2.84	20
West Virginia	0.55	0.14	1.11	1.80	49
Wisconsin	1.04	0.30	1.93	3.27	8
Wyoming	1.21	0.24	1.80	3.25	9
Total U.S.	1.06	0.34	1.37	2.81	

consumption from home brewing or winemaking, sales taken across state lines, illicit importation, and tourist visitor consumption.

D. Addiction

Progression into addiction is one of the most alarming trends of which the United State's population is afflicted. Statistics appear to indicate that the problem is worsening. In 1967 when the writer joined the staff of the primary prevention program with which he is currently employed, the National Council on Alcoholism placed the alcoholism toll at approximately five million adults. The gender division was placed near to sixty percent male and forty percent female. Currently, reports from the National Institute on Alcohol Abuse and Alcoholism range between fourteen to seventeen million alcoholics. Women have closed the gender gap and may be leading. In addition, teenage alcoholism is reflected between the four to five million range. DISCUS, the official Distilled Industry's magazine recognizes over one hundred million adult social drinkers. The writer believes a primary causal factor is exposed in the questions, "Why do so many people fear a doctor?" Or, "How sick must an individual be before he will seek out a doctor?" "Must the situation require a stretcher and a rescue unit?" "How sick (diseased) must a nation become before an adequate diagnosis and remedy is derived?"

Even today, with all the documentation and the professional expertise available, it is difficult to obtain a comprehensive and uniformly accepted analysis of the extent of addiction.

The Jellinek Formula, originally proposed by Dr. E. M. Jellinek and later repudiated by him, is utilized by many authorities today. It is as follows:

$$A = \frac{(P \cdot D)}{K} R$$

A = The number of alcoholics alive in a given year

P = The percentage of liver cirrhosis deaths attributable to alcoholism, a presumed constant which Jellinek originally calculated at 51.5% for males and 17.7% for females, but revised to 62.8% and 21.6% respectively

D = The number of reported deaths from liver cirrhosis in a given year; use only the federal vital statistics, for uniformity

K = The percentage of all alcoholics with medical complications who die of cirrhosis of the liver, which Jellinek calculated by multiplying 9% of alcoholics with liver cirrhosis by 7.71% who had died from it, equals .00694, presumed a constant

R = The ratio of all alcoholics to those alcoholics with medical complications, originally estimated at 4 but revised to 5.3 by Jellinek⁵

Another approach in the search for a cause of addiction is the theoretical method. Three classes are most prominent: 1. Physiological, 2. Psychological, and 3. Sociological.

1. The physiological Theory is sub-divided into four related theories.

- a. Genetic theory - alcoholism may be inherited
- b. Endocrine theory - a dysfunction of the endocrine system
- c. Genetotrophic theory - combines the genetic trait and nutritional deficiency

- d. Other Physiological theories - include factors such as allergies, metabolic rates, and congeners in alcoholic beverages.

2. Psychological Theory is sub-divided into three related theories in an alcoholic personality.

- a. Psychoanalytic Theory - The Freudian view - the Adlerian view and a third view that alcoholism develops as a response to an inner conflict between dependency drives aggressive impulses.
- b. Learning Theory - A reflex response to some stimulus.
- c. Personality Trait Theory - Difference of opinion persists whether an alcoholic personality predates alcoholism or is a consequence of it.

3. Sociological Theory is sub-divided into two related theories

- a. Cultural Theory - influences toward alcoholism are within the culture.
- b. Deviant Behavior Theory - forced by society into a deviant role.⁶

It is quite evident that the search for either a single or multiple combination of causes has eluded public acceptance. The writer proposes the possibility of a fallacy in the basic premise of society that identifies the addict as a problem but the social drinker as normal. Could the answer reside in the question, "What is wrong with a social drinker who requires a toxic-depressant-tranquilizer in order to function and be accepted as normal?"

II. FAMILY LIVING

The American family is showing numerous signs that indicate many problem areas. The reports of divorce, assaults, abuse, abortion, neglect and many others that reach the criminal justice system and news media are probably only the tip of the iceberg. That the focus of professional assistance and legislative attention is turning more frequently to the family is encouraging.

The effect of alcohol on the individual and the collective family unit is all too often a taboo subject and covered up.

A. Spouse and Family

Whether a situation involves social drinking or addictive drinking, or whether one, several, or all of the family members are involved, the effects are too numerous to identify individually for this limited study. Several areas will serve to illustrate how the family is under attack through the consumption of alcoholic beverages with their subtle and hostile affects.

The family of the alcoholic may become as sick or sicker than the alcoholic. An alcoholic is known to intimately touch the lives of at least four other persons. The non-alcoholic person's needs and trauma usually are unnoticed because he is supposed to be the normal and dependable person. While treatment programs are reporting thirty to forty percent increases in success by treating the whole family, too many continue to be unresolved.

Traditionally, in American society, child-rearing and responsibility for the home are ascribed, primarily, to the mothers. Feelings of guilt and failure are very common and difficult to treat in alcoholic mothers.

*The guilt of the alcoholic mother is reinforced both by the stigma of being an alcoholic woman and by the real problems her drinking may have caused her family. Guilt regarding parenting during active drinking is a crucial treatment issue.*⁷

When the father in the family is also alcoholic, a compounding effect is often observed with economic problems, desertion, assaults, child delinquency, and abuse, triggering a vicious cycle of cause and effect rendering a successful resolution very difficult.

B. Fetal Alcohol Syndrome

During recent years the alcoholism treatment facilities, as well as the general public, have become increasingly aware of the damage to the fetus that results from drinking by pregnant women.

The isolation and early diagnosis of the Fetal Alcohol Syndrome was first recorded in depth by Dr. David Smith, Director of Research in the Psychology Department of the University of Washington, in 1973 following over eighteen years of study and research. Following those monumental findings, Dr. Smith and his team turned their attention to genetic aspects of the F.A.S. until his early and untimely death in 1980 and the loss of federal funds for the research project.

Dr. Ann Streisguth, Assistant in the F.A.S. project, noted the following characteristic features of the F.A.S.:

...short length and underweight, which do not catch up to normal later: small head, small brain, and mental deficiency; heart defects, poor coordination, abnormal creases on the palms; joint and limb irregularities, such as

*hip dislocation and odd fingers or toes, hyperactivity later in childhood. But along with the irreversible mental retardation and underweight, the most characteristic sign is the peculiar face; short palpebral fissures (narrow eye socket), epicanthal folds (skin over the inner corner of the eye), low nasal bridge with short upturned nose, narrow upper lip giving the mouth a fishlike shape, and often a receding chin, protruding forehead, and deformed ears.*⁸

With the early reports of the Fetal Alcohol Syndrome and evidence of impairment and damage, medical authorities were urging pregnant mothers, who drink, to drink very moderately. More recent findings indicate very critical damage to the developing nervous system during the first tri-mester of pregnancy. Too often, a mother-to-be may not know she is pregnant until after that period. The only ultimate safe procedure, therefore, is total abstinence.

Recently, the Federal Food and Drug Administration requested that warning labels be placed on all alcoholic beverage containers, alerting mothers-to-be of the dangers of drinking during pregnancy.⁹

In the event that the F.D.A. request is not granted, several bills are pending in Congress which would mandate health warning labels.

C. Child Abuse

The fact of child abuse by alcoholic parents, in particular, is receiving increased attention by law enforcement, criminal justice, social workers, educators, community leaders, and just average citizens. Abuse may be physical assault, sexual deviant behavior, incest, and neglect.

In her book "It Will Never Happen To Me," Claudia Black, a woman who is doing pioneer work with children growing up in alcoholic homes and with adult children of alcoholics noted that, *sixty percent have (been) either physically abused themselves or witnessed the abuse of someone else in the family.*¹⁰

There are many developing indications that the relationship between alcohol abuse and incest is even greater than has been documented thus far.

III. TRAFFIC SAFETY

"It will never happen to me!" Those six words are representative of the average teenage driver on the highways today. But, it does.

Previous chapters have noted the effects of alcohol on the function and structure of the human body. The effects of alcohol also impact the sociological and family dimensions of this society. The toll of life in traffic accidents conveys more human trauma and hostilities to more people than any other experience except war. However, the war toll usually comes in clustered experiences while the traffic toll is a daily event.

A brief overview and review of some statistical data relative to traffic safety will be helpful before the study considers the problem involved and the answer in the light of alcohol's effects and role in the problem.

A. Statistical Review

The writer has invested a major portion of his life in an endeavor to carry a message of health and safety to young people and adults across the State of Washington. Over the past fifteen years the

writer has addressed more than 450,000 students in public and private schools in their classrooms on varied phases of health and safety.

From the National Center For Health Statistics and the Fatal Accident Reporting System of the National Highway Traffic Safety Administration, the following statistics reveal some awesome facts for 1980:

** Motor vehicle accidents are the leading cause of death among persons 15 to 24 years of age; 45 per 100,000 died in fatal crashes in 1980.*

** More than 16,500 youths 15 to 24 years of age died in 1980 as a result of motor vehicle accidents.*

** More motor vehicle fatalities occurred among 15 to 21 year olds on weekend evenings between 11 p.m. and 3 a.m. than occurred any other time.*

** One out of every four senior high school students was at risk for alcohol-related accidents at least once during the previous year. Over half a million 10th to 12th grade students drove after they had a "good bit" to drink 10 or more times during the previous year.*

** In states with a 21 year minimum drinking age law, senior high school students consumed less alcohol than did students in States with other types of drinking age laws. Nonetheless, levels of alcohol use remain high in 21 year States. For example, 24 percent of senior high students in 21 year States drank as often as once a week, only 9 percent fewer than the students in States where the minimum age was*

18, 19, or 20 years.¹¹

On the national scene, 44% of the fatalities in multiple car accidents are innocent people. It is dangerous to be on the highways at any time. When an individual moves from the passenger seat to the seat behind the wheel of the car, he has moved into the Number One hazard position on the highway. The one-car accident is the only class of accident that has gone up in the State of Washington during 1983. There are more teenagers than any other age group involved in one-car accidents. The primary cause for a teenage one-car accident, listed more frequently than any other cause on the investigated report of the Washington State Highway Patrol, is alcohol, and that is not drunk by code (0.10%). The violation for a person under twenty-one in Washington State is the first drink. The effect of the alcohol on the frontal lobe of the brain begins with the first drink.

With the preceding statistical review, the writer introduces the next phase.

B. Psycho - Sensory Motor Coordination

The four words in the section heading describe what driving a motor vehicle involves. The psyche is the mind, the sensory is the nervous system, motor relates to the muscular system, and coordination is the cerebellum which coordinates the entire operation to permit a driver to arrive at a destination safely.

The reader is referred to the blood-alcohol chart on page 37 for the sequence of the following description.

Within thirty minutes of ingesting the first drink, the alcohol will be penetrating the cells of the nervous system supplied with

oxygen by the circulatory system. At this point, the alcohol is penetrating the nerve cells also. The B.A.C. is between 0.01% and 0.10%. The effect of the alcohol on the cerebrum at that level tends to render the driver over confident which results in higher speeds and the one-car accident.

As ingestion increases, the B.A.C. rises above the 0.10% to 0.15% and the driver is drunk. The alcohol reaches the deeper functioning centers of the brain in the cerebellum. The frontal lobe experiences an even deeper depression and anesthesia. The multiple car accident is most frequent at this level, often, with innocent people involved.

Above the 0.30% level a stuporous effect is observed, very similar to alcoholics seen in the skid-road area. At the 0.40% level the average consumer will pass into unconsciousness. Now the liver is given an opportunity to detoxify the alcohol and lower the B.A.C., unless the consumer has chug-a-lugged or become involved in a contest in which he consumes faster than the alcohol is absorbed. In that event, the B.A.C. will continue to rise until it levels off in balance with the alcohol in the stomach. If the B.A.C. rises above the 0.45% level, the medulla oblongata will be anesthetized, paralyzing the respiratory, circulatory, and nervous systems in an overdose, resulting in death by toxic poisoning. Without medical first aid, there is no antidote for the alcohol in the blood at that level.

C. The Problem

Determination by the consuming public to drink and then drive has created a large and sustained problem in traffic safety. The failure of the administrative, legislative, judicial, and criminal justice

systems to move effectively in concert has served to exacerbate the problem.

More and more voices are uniting to counter the epidemic proportions to which the problem has grown.

Sandy Golden, a former television investigative reporter, left his position when confronted with the enormity of the alcohol effected problem on the highways to mount a campaign for safety.¹²

Mr. Golden's work, along with others, will be highlighted in Chapter Seven.

CHAPTER SIX

ALCOHOL AND BEHAVIOR

The underlying, as well as the over-riding, purpose of this study was to identify and comprehend the effects of alcohol on human behavior. To maintain perspective and, at the same time, sustain the limitations proposed for the present phase, the writer has limited the study of alcohol's effects on behavior to the two environs of psychological behavior and ethical principles.

I. PSYCHOLOGICAL ASPECTS OF BEHAVIOR

The dictionary defines psychology as (1) *the mental or behavioral characteristics of an individual or group* and (2) *the study of mind and behavior in relation to a particular field of knowledge.*¹

The definition immediately suggests the most primary of pursuits in the questions, "Who Am I?" and "Why Am I Here?" and "Where Am I Going?"

A. Drinking Habits

Having established a field of knowledge in the earlier chapters relative to alcohol's effects on function and structure of the human body, it is logical to ask, "Why do people drink?"

Given the character of the drug, ethanol, in its physical properties, and, given the character of the human body in its tissues,

systems, and fluids, drinking an alcoholic beverage becomes a simple exercise in self-destruction.

Professionals and authorities in the field of alcoholism list numerous reasons given by adherents to the drinking culture for their participation in the cult. John Dollard identifies two major control factors: conscience and social custom.² The two factors position the drinker in relation to unrestrained pleasure-seeking and control behavior while maintaining mobility within a chosen socially and ideologically democratic people.

Thomas Plaut, in his study of trends in American drinking patterns, identifies a closer tie with given cultural habits.³ He observed a shift from most drinking fifty years ago in bars and saloons to homes and private clubs. He recognized a greater acceptance of drinking in the presence of women and by women in a culturally accepted practice.

Albion Roy King examined the psychological motivational drive to drink noting several: incidental, special occasion, heredity, habit, personal satisfaction, excitement, relaxation, sociability, escape, anxiety, and dependence.⁴

B. Mental Retardation

Acknowledging that alcoholic beverages are consumed by many segments of the population, the problem of alcoholism strikes at every segment. Until recently, little attention had been given to the drinking habits of normal people who eventually deteriorate into mental retardation. It was assumed, probably, that since those who became mentally retarded could not make reasonable judgments about alcohol and its use, they became alcoholic.

In a study of the mentally retarded, Diana M. DiNitto made several notable observations:

First, one third of the participants said that at some point they had missed work because they felt sick from drinking. Seven discovered that they had drunk at work, but only two individuals reported that they had been in trouble for drinking on the job.

Second, an earlier study indicated that the group frequently experienced social difficulties among family members and friends, including their own hostile or aggressive behavior brought on by excessive drinking.

Third, in addition, seven percent of the respondents who said they drank reported that they had been in trouble with the police because of drinking.⁵

While the physical properties that characterize ethanol are constant and predictable, the individual is affected on the basis of personal characteristics, culture, environment, and economic status in life.

II. ETHICAL PRINCIPLES

Essentially, ethical principles pertain to issues and decisions qualified by right and wrong. A critical difficulty is inherent with the selection of a standard of right and wrong. If the standard rests on absolute concepts, it will be stable. If the standard rests on vacillating temporal supports influenced by unstable emotional supports, the standard will reflect the insecurity of the principles.

A. Morals and Ethics Defined

Morals is defined by Webster's Dictionary as: (1) good character or conduct according to civilized standards, (2) behavior based on

principles of right conduct rather than law or custom, (3) teaching a good lesson or having a good influence, (4) refers to the customary rules and accepted standards of society, such as, "He leads a moral life".

Ethics is defined by Webster's Dictionary as: (1) the study of standards of right and wrong; that part of science dealing with moral conduct, duty, and judgment: Ethics is concerned with morality, (2) formal or professional rules of right and wrong; a system of conduct or behavior; moral principles by which a person is guided.

Therefore, *moral* is that quality or result of an act or situation that may be qualified as "good" or "bad". *Ethic* is a principle or rule that determines the "right" or "wrong" of an act or situation.

By way of illustration, consider the following:

Consumption of an alcoholic beverage is *moral* (good) for the licensee because the sale of the beverage means profit. Consumption of an alcoholic beverage is *immoral* (bad) for the consumer because the alcohol destroys tissue and impairs coordination resulting in deteriorated health or an accident.

Consumption of an alcoholic beverage for a person over twenty-one years of age is *ethical* (right) because it is legal. Consumption of an alcoholic beverage for a person under twenty-one years of age is *unethical* (wrong) because it is illegal.

The ramifications of *moral* and *ethical* principles create numerous situations with monumental confusion.

B. Tolerance Defined

Tolerance is defined by Webster's Dictionary as: *the power of*

enduring or resisting the action of a drug, poison, etc. A practical definition of tolerance in the drinking culture is to describe the consumer as being able to *hold* one's liquor. The consumer is capable of consuming a larger volume than formerly while manifesting a diminished effect.

The human body for some people tends to develop a physiological tolerance. The consumer drinks more to receive the same effect. An increasing tolerance manifests a major control factor in physiological and psychological tolerance. The consumer is enabled to increase frequency and volume of consumption.

A comparative study of social drinking and tolerance was conducted by Peter Nathaw, Ph. D. of the Rutgers University Department of Clinical Psychology. He observed in his clients that there is a difference between the sober and intoxicated state if the client has a higher tolerance.

High tolerance may be involved in the development of alcoholism. *If tolerance does not lead to dizziness or nausea, then this may be one reason that alcoholics can drink as much as they do in early years.*⁶ Early years, here, means early years of drinking.

Tolerance for many consumers is subjectively defined as a mental attitude with little or no basis in objective substance. Subjectively, the high tolerance in large volume consumption for a heavy drinker is justified on an ethical standard because the heavy drinker is not an alcoholic, that is, the heavy drinker may stop whenever it is convenient, the alcoholic cannot. Concurrently, the heavy drinker confronts an unethical situation when the high tolerance and heavy

consumption (even on the same volume of an alcoholic) produce an identical deterioration of tissue structure and function as if the heavy drinker were an alcoholic. The heavy drinker's high tolerance is unethical or "wrong" by generating an unhealthy response in the body.

Tolerance may be influenced by peer pressure. Peer pressure is usually equated, sociologically, as a negative force. The object of the pressure feels forced into an unacceptable situation or act. However, peer pressure may be just as positive as it is negative.

When a decision to drink socially is made on the insecure foundation of tolerance, the future is very insecure, and deterioration in addiction may follow.

CHAPTER SEVEN

CITIZENSHIP AND LEGISLATION

Freedom involves risk and the possibility of failure. It is very similar to the exercise of deep love. An individual who sincerely loves exposes himself to severe hurts. In order for freedom to operate effectively, while preserving the essential core of freedom, laws become a necessity. Laws restrict freedom. If people really cared for each other, really loved with a love that is one hundred percent for the one loved, there would be no need for laws. The only requirement would be a mutually agreeable set of regulations for the essentials of life acceptable to all. While many attempts have been made to establish that kind of ideal relationship, they have never been sustained.

At various times in the life of our nation, an emphatic reference is made to our *democratic* system of government. A pure democracy requires the functioning participation of every member in every decision. Inherent to the character and operation of a pure democracy is chaos and a take-over by dictatorship. Ours is a republic. Government is by elected representatives. The assignment of responsibility by election establishes some safeguards against mass confusion while speeding the process of government.

Thus, citizenship and legislation are two very essential ingredients in the smooth operation and preservation of an effective republic.

The limited scope of this study is to identify and evaluate the effects of alcohol to achieve the highest degree and quality of life for every member of that republic.

I. CITIZENSHIP

Throughout the life of this republic there have been a few individuals rising above the multitude to receive the distinction of *statesman*. Few receive that acclaim. A new element has been exposed in the flow of society that severely restricts and may corrupt statesmanship in citizenship. It is called the "Third House" or the act of lobbying for self or group interest and benefit. Pure lobbying provides essential information for the representative to govern effectively. When any level of government is infected with corrupted morals, the health of the republic is jeopardized, and, with it, the life of every member of the republic, even those who profit from violation.

Citizenship that involves the full participation of every person is critical and essential to effect and sustain the highest quality of life for all members.

The tide flow of alcohol's role in the world social order has recorded its up's and down's throughout history. It ranges from complete freedom of access to total abolition by law. The search continues for a more acceptable and effective solution.

The saloon was recording its highest levels of activity and success in the early twentieth century. With society, crime, and the family deeply afflicted, prohibition (often called the noble experiment) was initiated in 1917 and enacted in 1920. Legal per capita consumption dropped to its lowest levels of record. Crime and violation began to thrive and spread. Repeal of prohibition came on April 5, 1933. Since repeal, per-capita consumption has risen to its highest levels on record. The toll in life, property, suffering, and the economy is enormous.

In August of 1971 the National Conference of Commissioners on Uniform State Laws, comprised of representatives of governors of each state, adopted the *Uniform Alcoholism and Intoxication Treatment Act*.¹

The entire model act with comments is printed as Appendix A of the first NIAAA special report to congress, *Alcohol and Health* (1971). It is available in most public libraries and state alcoholism agencies.

It was hailed as the ultimate solution. Provision has been made to care for some of the alcoholic citizens. The alcoholic count continues to rise. The cost of treatment continues to escalate.

Once again, citizen involvement began to increase. Some of the feature programs were tabulated in a feature article entitled, "Liquor Liability Laws; The Continuing Search For Responsibility."²

The primary care physician, a health care professional with a first contact potential, is often the source of medical care for an alcoholic or alcoholic abused patient. Most initial contacts by patients with alcohol problems are psychosocial rather than biomedical in nature. Primary care practitioners need to become acutely sensitive to the interpersonal, emotional, and occupational symptoms that indicate

problems caused by alcohol.

Recent developments indicate that changes are occurring with promise for improved education in alcohol problems relative to family practice training programs.³

A volunteer is defined as one who enters into or offers himself or herself for a service of his or her own free will without valuable consideration or legal obligation. Volunteerism⁴ is a rapidly developing service potential for every need in our society. Volunteers are finding service in personal care, fund raising, transportation, shopping, house work, correspondence, and many other areas where people need help.

The need, opportunity, and development of citizen participation provides encouragement for the future.

II. LEGISLATION

Politics has been referred to, frequently, as the art of the possible. Legislation makes it all happen. Legislation is a representative system of government at work. While it may not be the best, always, and does not satisfy everyone, it is the best and the only system going at this time.

Every year, numerous bills, proposing to remedy the ills of a society and provide a better atmosphere in which to live, are introduced for consideration in the state legislatures and federal congress. Note the chart in the appendix for the procedure by which a proposed bill becomes law.

During the 1984 session of the Washington State Legislature, many

bills were introduced that addressed alcohol oriented and initiated concerns. The bills range from promotion, control, to treatment. Most bills only nip at a problem because it is very difficult to take major moves that tend to impact too many adjacent aspects of life in the state.

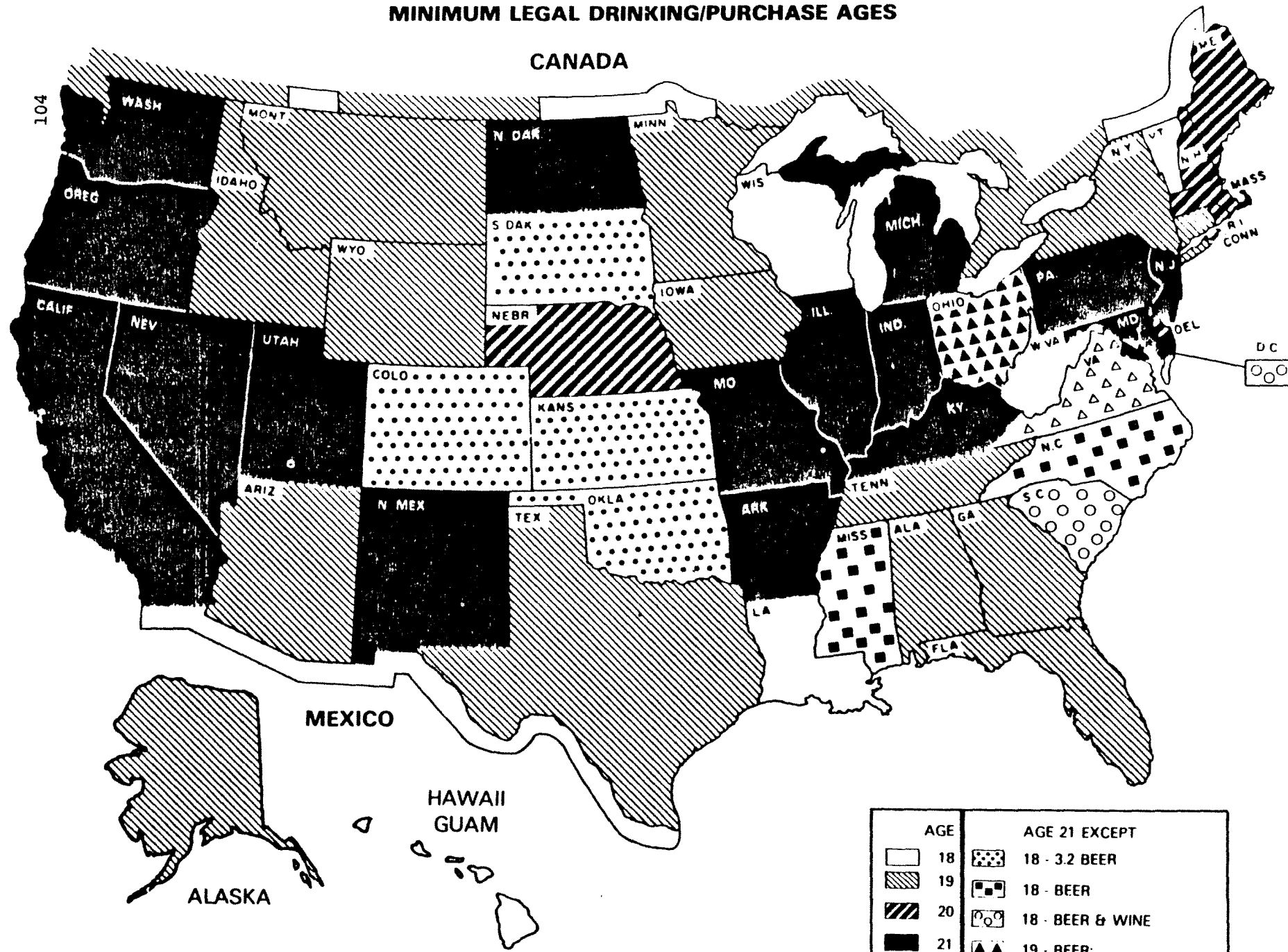
Legislation to control crime of every character is considered annually. It has been asserted, frequently, on the basis of "statistics" that 60 percent of all criminal offenses are due directly to alcoholic intoxication.⁵ (That is, the violation was committed when the violator was under the influence of alcohol).

*Liquor control laws are classified into at least eight groups: (1) Statutes against drunkenness and disorder, (2) price fixing, (3) license laws, (4) revenue acts, (5) trade laws, (6) items of discriminatory legislation, (7) judge-made laws that relate to criminal and civil capacity responsibility, and (8) state-store acts.*⁶

The legal drinking age is a perpetual issue before state legislatures because it is a state's rights issue. Between the years of 1970 - 1975, thirty-one of the states lowered their legal drinking age to some degree. Since that time, every one of those states either has or is in some stage of legislative activity to raise their legal age. Please note the chart on page 104 on minimum legal drinking ages as of 1981.

The writer was actively engaged in authoring a "Comprehensive Alcohol Control And Revenue" bill that was introduced into the Washington State House of Representatives as H.B. 937 on

NATIONAL TRANSPORTATION SAFETY BOARD MINIMUM LEGAL DRINKING/PURCHASE AGES



February 22, 1983. The reader is referred to the Appendix for a complete text of the bill along with a resume statement of the provisions incorporated into the bill for consideration as state law. The bill, if enacted, will mandate a total level of personal responsibility for each consumer along with removing a basic conflict of interest that is a part of present state law in our control-state policy.

Active citizenship maintains an open-door policy for anyone willing to prepare himself for participation.

CHAPTER EIGHT

ALTERNATIVES: REHABILITATION, INTERVENTION, PREVENTION

Life constitutes a series of alternative decisions. Decisions are not made by man from the foundation or background of absolute knowledge. The alternative possibilities from which a person draws and the options open in decision are not articulately qualified as right and wrong, good and bad. In fact, the great majority of alternative decisions recorded in personal experience fall within the parameter of possibilities qualified as better and best.

Solutions to the problems associated with the effects of alcohol are neither easy to diagnose and isolate in definition, nor to resolve and eliminate them as a persistent reality.

The three alternatives noted qualify. None is ideal in a less than ideal world. Each is essential.

I. REHABILITATION

Any person who is sick or hurting is worthy of assistance for recovery to the level and degree of health possible.

Alcoholism is complex, and each individual is a unique individual. In addition to the alcoholism, each patient brings a unique combination of problems which must receive attention if rehabilitation is to occur.

Rehabilitative treatment may be brief and simple. It may be long range and complex. Whatever its nature or length, every facet of administered help should be directed toward ultimate healing.

Meeting the immediate and critical need of an alcoholic is not treatment. Detoxification and withdrawal serve only to prepare the patient for treatment and recovery. Treatment may be either inpatient, outpatient, or both. The best approach is devised by the therapist in consultation with the patient.

Both public and private agencies have made some excellent programs available in rehabilitation. Alcoholics Anonymous provides one of the most readily available and economical programs for rehabilitation. There are no service fees, participation is entirely voluntary, and a listing of local chapters is available in any phone directory. The Salvation Army Program is an excellent illustration of a private agency.

It is not the purpose, nor is it within the scope of this study to either list the available services or to evaluate their merits. It is sufficient to note that excellent and varied programs are available for any person who wants and needs help. The solution to the problem begins at that point. It is very difficult, if not impossible, to rehabilitate an alcoholic who does not acknowledge his or her addiction. It is possible to place an alcoholic in solitary confinement for detoxification and withdrawal. However, as soon as he is released, he will usually return to active consumption in which he was engaged before initial treatment.

For a thorough listing and evaluation of services available, the reader is referred and encouraged to pursue a more thorough under-

standing of the treatment modes in the work of Dr. James R. Royce, Alcohol Problems and Alcoholism, fully documented in the Bibliography.

II. INTERVENTION

Rehabilitation remains the best and only alternative available for a practicing alcoholic with the current package of medical and therapeutic services. The only exception would be a miraculous spiritual transformation to completely alter the addictive syndrome. The next step up the ladder of priority preference is *Intervention*.

Intervention may be defined as a deliberate and wilful interruption of the progressive deterioration cycle characteristic of the addictive syndrome in order to arrest and stop the digression and effect a reversal to bring the patient to the place where he may re-establish control over his own life and circumstances. Intervention requires an informed and caring individual. In the hands of an unskilled and uninformed person, intervention could be perilous.

A more recent and rapidly developing therapy mode is "Occupational Alcoholism Programming".

Occupational Alcoholism Programming has developed in response to the need of occupational groups and industry to identify problem drinking employees through observation of poor job performance and to provide intervention techniques for referral and treatment to ameliorate these performance problems. Its major goals are to enable the problem-drinking employee to return to health and to regain an adequate job performance level.¹

The programs are structured to operate under four assumptions:

(1) Supervisor's awareness of impaired performance, (2) the alcoholism regarded as a medical problem in the workplace, (3) suspension of regular disciplinary procedures for poor performance, and (4) a return to productive performance for termination of treatment as successful.²

There are important differences between the social and private criteria for development of intervention programs. From an employer's perspective, alcohol users have a higher turnover rate than non-users. Intervention will result in economic benefits to the firm by avoiding replacement costs such as search, interview, recruitment, training, and lower productivity rate of a new employee. On the executive level, the cost is much higher so the firm saves money by retaining and saving an employee whose treatment is successful.

The value of intervention to the alcohol user whose job is saved, life potential is restored, and whose productivity is back on track is incalculable.

III. PREVENTION

Primary prevention is the highest priority emphasis as the answer to the alcohol-drug problem. Is the American society ready for a more positive prevention program? This study has briefly, and only superficially, referred to the record of alcohol consumption and control laws through this century in the United States. Statistics reveal factors that create much confusion to the uninformed. The total number of drinkers is up, but consumption is down for some types of drink. The total accident fatality rate is down, but the alcohol initiated accident remains high because more younger people have begun to consume and drive. We have more excellent treatment facilities available than

at any other time in history, but costs are rendering full utilization less than effective so that the total cost of a sustained alcoholism problem continues to mount.

Primary prevention may be on the threshold of its most productive opportunity.

Philosophies abound in the prevention field. Prevention, in general, aims at reducing the rates of occurrence of a condition.

*Contrary to general belief, there is no evidence that control or eradication of any disease has been accomplished by the approach, procedures, techniques, and activities directed at early diagnosis and treatment of disease in individuals.*³

Primary prevention can be defined as:

*...a proactive process that focuses on capacity-building for individuals, families, groups, institutions, and social systems, in order to promote the personal and social growth of the individual toward full human potential and thereby reducing or inhibiting physical, emotional, or social impairment that results from the abuse of chemical substances.*⁴

Non-drinking is still the preferred behavior and dominant pattern of life for many people. But, even among alcohol users, drinkers are switching to beverages with less alcoholic content. Lowering the rate and volume of consumption is prevention. *Soft drinks are more popular than ever, but the latest trend involves switching to soft drinks that contain no caffeine. The trend away from that drug has been accomplished by a search for not only pure water but various types of commercially bottled water.*⁵

There are some major and glaring contradictions in educational procedures and programs that leave young people very confused. There is little sense to have a school based program teach children that alcohol does not make a person sexy or help get the right kind of friends, and then go out to face an environment where children see wealthy, powerful, successful, and glamorous people advertised as having all the good things in life associated with alcohol.

The writer has invested a major portion of his life encouraging young people to consider the positive dimensions of a drug-free life: better health, safer mobility, preserved financial security, full recollection of those most precious moments in life, and a productive life-style that may be a positive model for the next generation.

The justification? If only one life were persuaded to choose the drug-free life, it would be worth it all!

If volitional abstinence were embraced by each person living in the United States today, the following would accrue: (1) Within one year, more than twenty-five thousand persons who are destined to die at the hand of an alcohol influenced driver, would be alive, (2) within one generation, the practicing alcoholic would be eliminated from our social order, (3) a better quality of goods would be produced in industry, (4) the diversion of funds, previously spent for alcoholic beverages (47 billion in 1982) and the economic crises created in the lives of those who consumed, would generate more jobs in business, industry, recreation, the arts, and entertainment.

APPENDIX

RESUME: HOUSE BILL NO. 937

The following is a resume of the essential provisions of House Bill 937, a Comprehensive Alcohol Control and Revenue Bill, introduced in the 1983 Session of the Washington State Legislature.

There are three major provisions in the bill:

1. Economic Control...The transfer of the cost of all programs authorized by the Legislature and generated by the consumption of alcoholic beverages from the General Tax Fund to the Liquor Revolving Fund. (p. 116, line 20).

The transfer shall be 20% per annum of the alcohol generated portion of the general fund until 100% transferred in five (5) years, (p. 117, sec. 2, lines 3-25), (p. 123, sec. 14), (p. 125, sec. 16).

Provide for an automatic internal funding to increase or decrease the taxes and mark up on liquor for legislatively authorized programs. (p. 120, lines 13-17).

The benefit:

- * Fiscal economic and personal responsibility.
- * Free millions of dollars in the general fund for programs that will benefit all citizens.
- * Place an internal economic control factor on the production,

distribution, sale, and consumption of alcoholic beverages.

- * With an economic control of volume and frequency of consumption, a lowering of progression to alcoholism.
- * Adequate funding base for all alcohol oriented authorized programs.

2. Consumer's License...To require that a person who purchases and consumes alcoholic beverages in a licensed or permitted facility must obtain a consumer's license purchased in conjunction with the existing "identocard" or the state driver's license. (p. 116, line 17: p. 120, sec. 7; p. 121, line 27; p. 123, line 14; p. 124, sec. 15).

The benefits:

- * A uniform identification system for law enforcement.
- * Discourage under-age consumption.
- * Protect licensees from violation in serving under-age and un-licensed consumers.

3. Liability Insurance... Require consumer's liability insurance. The Consumer's Liability Insurance (similar to automobile liability insurance, or property owner's liability insurance) shall be obtained before seeking the consumer's license. If the licensee fails to renew the insurance premium or has the insurance cancelled, the consumer's license shall be cancelled. (p. 116, line 19; p. 125, lines 31-32).

The benefits:

- * The insurance shall provide funds for third party coverage of treatment costs for those who require rehabilitation in authorized facilities.
- * The insurance will provide a fund and recourse for the innocent victims of alcohol oriented accidents, assaults, neglect, and

legally or judicially authorized recompense.

Please refer to the complete bill for details of the proposed revised law. Request a copy from the Washington Council On Alcohol Problems.

HOUSE BILL NO. 937

State of Washington 48th Legislature 1983 Regular Session

(The following is the text of the bill as it would revise the
Washington State Law incorporating the new provisions.)

Read first time February 22, 1983, and referred to Committee on
Commerce & Economic Development.

1 AN ACT Relating to alcoholic beverage control; amending
2 section 77, chapter 62, Laws of 1933 ex. sess. as last amended by
3 section 6, chapter 5, Laws of 1981 1st ex. sess. and RCW
4 66.08.180; amending section 6, chapter 175, Laws of 1957 and RCW
5 66.08.190; amending section 7, chapter 175, Laws of 1957 as last
6 amended by section 167, chapter 151, Laws of 1979 and RCW
7 66.08.200; amending section 8, chapter 175, Laws of 1957 as last
8 amended by section 168, chapter 151, Laws of 1979 and RCW
9 66.08.210; amending section 4, chapter 62, Laws of 1933 ex. sess.
10 as last amended by section 10, chapter 172, Laws of 1939 and RCW
11 66.16.010; amending section 7, chapter 62, Laws of 1933 ex. sess.
12 as last amended by section 8, chapter 5, Laws of 1981 1st ex.
13 sess. and RCW 66.16.040; amending section 1 chapter 67, Laws of
14 1949 as last amended by section 4 chapter 209, Laws of 1973
15 1st ex. sess. and RCW 66.20.160; amending section 2, chapter 67,
16 Laws of 1949 as last amended by section 5, chapter 209, Laws of
17 1973 1st ex. sess. and RCW 66.20.170; amending section 3,
18 chapter 67, Laws of 1949 as last amended by section 6, chapter 209,
19 Laws of 1973 1st ex. sess. and RCW 66.20.180; amending section 5,
20 chapter 67, Laws of 1949 as last amended by section 8, chapter 209,
21 Laws of 1973 1st ex. sess. and RCW 66.20.200; amending section 6,
22 chapter 67, Laws of 1949 as last amended by section 9, chapter 209,
23 Laws of 1973 1st ex. sess. and RCW 66.20.210; adding a new section
24 to chapter 43.09 RCW; adding a new section to chapter 66.08 RCW;
25 adding new sections to chapter 66.28 RCW; creating a new section;
26 and providing an effective date.

1 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

2 NEW SECTION. Sec. 1. (1) The legislature finds that the
3 use and consumption of alcoholic beverages by citizens and guests
4 of the state of Washington impact individuals, families, industry,
5 schools, and health care facilities with increasing costs and
6 human suffering. Therefore, the legislature finds that legisla-
7 tion is required:

8 (a) To encourage and facilitate the highest level of
9 personal, civil, corporate, industrial, and judicial
10 responsibility relative to production, distribution, sale, and
11 consumption of alcoholic beverages and their impact on every
12 segment of the state of Washington; and

13 (b) To effect a more accurate accounting of revenues
14 available and services rendered.

15 (2) The goals noted in (1)(a) and (b) of this section shall
16 be accomplished by:

17 (a) Establishing a license to purchase and/or consume
18 alcoholic beverages;

19 (b) Requiring concurrent liability insurance coverage; and

20 (c) Recorganizing the revenue and service structure to
21 provide for revolving funding for services required.

22 Sec. 2 Section 77, chapter 62, Laws of 1933 ex. sess. as
23 last amended by section 6, chapter 5, Laws of 1981 1st ex. sess.
24 and RCW 66.08.180 are each amended to read as follows:

25 Moneys in the liquor revolving fund shall be distributed by
26 the board at least once every three months in accordance with RCW
27 66.08.190, 66.08.200 and 66.08.210: PROVIDED, That the board
28 shall reserve from distribution such amount not exceeding five
29 hundred thousand dollars as may be necessary for the proper
30 administration of this title: AND PROVIDED FURTHER, That all
31 license fees, penalties and forfeitures derived under this act
32 from class H licenses or class H licensees shall every three
33 months be disbursed by the board to the University of Washington
34 and to Washington State University for medical and biological
35 research relating to the effects of alcohol on humans only, in

such proportions as shall be determined by the board after consultation with the heads of said state institutions: AND PROVIDED FURTHER, That when the allocations in any biennium to the University of Washington and Washington State University shall amount to a total of one million dollars, the entire allocation for the remainder of the biennium shall be transferred to the general fund to be used by the department of social and health services solely to carry out the purposes of RCW 70.96.085, as now or hereafter amended: AND PROVIDED FURTHER, That twenty percent of the total amount derived from license fees pursuant to RCW 66.24.320, 66.24.330, 66.24.340, 66.24.350, 66.24.360, and 66.24.370, as such sections are now or hereafter amended, shall be transferred to the general fund to be used by the department of social and health services solely to carry out the purposes of RCW 70.96.085, as now or hereafter amended (~~(+AND-PROVIDED-FURTHER That-one-fourth-cent-per-liter-of-the-tax-imposed-by-RCW-66.24.210 shall-every-three-months-be-disbursed-by-the-board-to-Washington State-University-for-wine-and-wine-grape-research,-extension programs-related-to-wine-and-wine-grape-research,-and-resident instruction-in-both-wine-grape-production-and-the-processing aspects-of-the-wine-industry-in-accordance-with-RCW-28B.30.068)~~). The director of financial management shall prescribe suitable accounting procedure to insure that the funds transferred to the general fund to be used by the department of social and health services (~~(and)~~) as appropriated are separately accounted for.

Sec. 3. Section 6, chapter 175, Laws of 1957 and RCW 66.08.190 are each amended to read as follows:

When excess funds are distributed, all moneys subject to distribution shall be disbursed to the state and local governments solely to defray total costs resulting from alcoholism and use of alcohol in accordance with section 14 of this 1983 act. The distribution shall be as follows:

Fifty percent to the general fund of the state, ten percent to the counties of the state, and forty percent to the incorporated cities and towns of the state.

1 *Sec. 4. Section 7, chapter 175, Laws of 1957 as last amended*
2 *by section 167, chapter 151, Laws of 1979 and RCW 66.08.200 are*
3 *each amended to read as follows:*

4 *With respect to the ten percent share coming to the counties,*
5 *the computations for distribution shall be made by the state*
6 *agency responsible for collecting the same as follows:*

7 *The share coming to each eligible county shall be determined*
8 *by a division among the eligible counties according to the*
9 *relation which the population of the unincorporated area of such*
10 *eligible county, as last determined by the office of financial*
11 *management, bears to the population of the total combined*
12 *unincorporated areas of all eligible counties, as determined by*
13 *the office of financial management: PROVIDED, That no county in*
14 *which the sale of liquor is forbidden in the unincorporated area*
15 *thereof as the result of an election shall be entitled to share*
16 *in such distribution. "Unincorporated area" means all that*
17 *portion of any county not included within the limits of*
18 *incorporated cities and towns.*

19 *When a special county census has been conducted for the*
20 *purpose of determining the population base of a county's*
21 *unincorporated area for use in the distribution of liquor funds,*
22 *the census figure shall become effective for the purpose of*
23 *distributing funds as of the official census date once the census*
24 *date results have been certified by the office of financial*
25 *management and officially submitted to the office of the secretary*
26 *of state.*

27 *The amount distributed to a county shall not exceed the*
28 *estimate of total costs attributed to the use of alcohol*
29 *calculated in accordance with section 14 of this 1983 act. Funds*
30 *in excess of the county's alcohol-related expenses shall be*
31 *returned to the liquor revolving fund.*

32 *Sec. 5. Section 8, chapter 175, Laws of 1957 as last amended*
33 *by section 168, chapter 151, Laws of 1979 and RCW 66.08.210 are*
34 *each amended to read as follows:*

35 *With respect to the forty percent share coming to the*

1 incorporated cities and towns, the computations for distribution
2 shall be made by the state agency responsible for collecting the
3 same as follows:

4 (1) The share coming to each eligible city or town shall be
5 determined by a division among the eligible cities and towns
6 within the state ratably on the basis of population as last
7 determined by the office of financial management: AND PROVIDED,
8 That no city or town in which the sale of liquor is forbidden as
9 the result of an election shall be entitled to any share in such
10 distribution, except to cover costs of alcohol-related expenses
11 attributed to consumption outside such city or town.

12 (2) The amount distributed to a city or town shall not
13 exceed the estimate of total costs attributed to the use of
14 alcohol calculated in accordance with section 14 of this 1983 act.
15 Funds in excess of the city or town's alcohol-related expenses
16 shall be returned to the liquor revolving fund.

17 Sec. 6 Section 4, chapter 62, Laws of 1933 ex. sess. as last
18 amended by section 10, chapter 172, Laws of 1939 and RCW 66.16.010
19 are each amended to read as follows:

20 (1) There shall be established at such places throughout the
21 state as the liquor control board, constituted under this title,
22 shall deem advisable, stores to be known as "state liquor stores,"
23 for the sale of liquor in accordance with the provisions of this
24 title and the regulations: PROVIDED, That the prices of all
25 liquor shall be fixed by the board from time to time so that the
26 net annual revenue received by the board therefrom shall (~~not~~
27 ~~exceed-thirty-five-percent~~) meet the costs to the state and local
28 governments from use of alcohol as outlined in section 14 of this
29 1983 act.

30 (2) The liquor control board may, from time to time, fix
31 the special price at which pure ethyl alcohol may be sold to
32 physicians and dentists and institutions regularly conducted as
33 hospitals, for use or consumption only in such hospitals: and may
34 also fix the special price at which pure ethyl alcohol may be sold
35 to schools, colleges and universities within the state for use for

1 scientific purposes. Regularly conducted hospitals may have right
2 to purchase pure ethyl alcohol on a federal permit.

3 (3) The liquor control board may also fix the special price
4 at which pure ethyl alcohol may be sold to any department, branch
5 or institution of the state of Washington, federal government, or
6 to any person engaged in a manufacturing or industrial business
7 or in scientific pursuits requiring alcohol for use therein.

8 (4) The liquor control board may also fix a special price
9 at which pure ethyl may be sold to any private individual, and
10 shall make regulations governing such sale of alcohol to private
11 individuals as shall promote, as nearly as may be, the minimum
12 purchase of such alcohol by such persons.

13 (5) In the event that the liquor revolving fund falls below
14 a five hundred thousand dollar reserve for administration of
15 authorized programs and services under this 1983 act, liquor
16 prices shall be adjusted, not more frequently than quarterly, to
17 provide adequate revenues for approved programs and services.

18 Sec. 7., Section 7, chapter 62, Laws of 1933 ex. sess. as
19 last amended by section 8, chapter 5, Laws of 1981 1st ex. sess.
20 and RCW 66.16.040 are each amended to read as follows:

21 Except as otherwise provided by law, an employee in a state
22 liquor store or agency may sell liquor to any person of legal age
23 licensed to purchase alcoholic beverages (~~and may also sell to~~
24 ~~holders of permits such liquor as may be purchased under such~~
25 ~~permits~~)).

26 Where (~~there may be a question of a person's right to~~
27 ~~purchase liquor by reason of age~~) a person claims exemption from
28 the licensing requirement of section 15 of this 1983 act, such
29 person shall be required to present any one of the following
30 officially issued cards of identification which shows his/her
31 correct age and bears his/her signature and photograph:

32 (1) Liquor control authority card of identification of any
33 state or province of Canada with reciprocity.

34 (2) Driver's license, instruction permit, or identification
35 card of any (~~state or~~) province of Canada (~~or "identified"~~

~~issued by the Washington state department of licensing pursuant to RCW 46.20.117))~~

(3) United States active duty military identification.

(4) Passport issued by a foreign country.

(5) Merchant Marine identification card issued by the United States Coast Guard.

The board may adopt such regulations as it deems proper covering the acceptance of such cards of identification which establish compliance with requirements of section 15 of this 1983 act.

No liquor sold under this section shall be delivered until the purchaser has paid for the liquor in cash.

Sec. 8. Section 1, chapter 67, Laws of 1949 as last amended by section 4, chapter 209, Laws of 1973 1st ex. sess. and RCW 66.20.160 are each amended to read as follows:

Words and phrases as used in RCW 66.20.160 to 66.20.210, inclusive, shall have the following meaning:

~~("Card-of-identification"-means-any-one-of-these-cards described-in-RCW-66.16.040.))~~

"Licensee" means the holder of a retail liquor license issued by the board, and includes any employee or agent of the licensee.

"Store employee" means a person employed in a state liquor store or agency to sell liquor.

Sec. 9. Section 2, chapter 67, Laws of 1949 as last amended by section 5, chapter 209, Laws of 1973 1st ex. sess. and RCW 66.20.170 are each amended to read as follows:

A ~~(card-of-identification-may-for-the-purpose-of-this-title and))~~ license issued under section 15 of this 1983 act or identification of an exempt user under RCW 66.16.040 for the purpose of procuring liquor, may be accepted ~~((as-an identification-card))~~ by any licensee or store employee and as evidence of legal age of the person presenting such card, provided the licensee or store employee complies with the conditions and procedures prescribed herein and such regulations as may be made by the board.

1 Sec. 10. Section 3, chapter 67, Laws of 1949 as last amended
2 by section 6, chapter 209, Laws of 1973 1st ex. sess. and RCW
3 66.20.180 are each amended to read as follows:

4 A (~~(card-of-identification)~~) license issued under section 15
5 of this 1983 act or identification of an exempt user under RCW
6 66.16.040 shall be presented by the holder thereof upon request
7 of any licensee, store employee, peace officer, or enforcement
8 officer of the board for the purpose of aiding the licensee, store
9 employee, peace officer, or enforcement officer of the board to
10 determine whether or not such person is (~~(of-legal-age)~~) authorized
11 to purchase liquor when such person desires to procure liquor from
12 a licensed establishment or state liquor store or agency.

13 Sec. 11. Section 5, chapter 67, Laws of 1949 as last amended
14 by section 8, chapter 209, Laws of 1973 1st ex. sess. and RCW
15 66.20.200 are each amended to read as follows:

16 It shall be unlawful for the owner of a (~~(card-of~~
17 ~~identification)~~) license issued under section 15 of this 1983 act
18 to transfer the card to any other person for the purpose of aiding
19 such person to procure alcoholic beverages from any licensee or
20 store employee. Any person who shall permit his (~~(card-of~~
21 ~~identification)~~) license to be used by another or transfer such
22 card to another for the purpose of aiding such transferee to
23 obtain alcoholic beverages from a licensee or store employee,
24 shall be guilty of a misdemeanor and upon conviction thereof shall
25 be sentenced to pay a fine of not more than one hundred dollars or
26 imprisonment for not more than thirty days or both. Any person
27 not entitled thereto who unlawfully procures or has issued or
28 transferred to him a (~~(card-of-identification)~~) license, and any
29 person who possesses a (~~(card-of-identification)~~) license not
30 issued to him, and any person who makes any false statement on any
31 (~~(certification-card)~~) license required by (~~(RCW-66.20.180)~~)
32 section 15 of this 1983 act, as now or hereafter amended, to be
33 signed by him, shall be guilty of a misdemeanor and upon
34 conviction thereof shall be sentenced to pay a fine of not more
35 than one hundred dollars or imprisonment for not more than thirty

1 days or both.

2 Sec. 12. Section 6, chapter 67, Laws of 1949 as last amended
3 by section 9, chapter 209, Laws of 1973 1st ex. sess. and RCW
4 66.20.210 are each amended to read as follows:

5 No licensee or the agent or employee of the licensee, or
6 store employee, shall be prosecuted criminally or be sued in any
7 civil action for serving liquor to a person under legal age to
8 purchase liquor if such person has presented a (~~card-of~~
9 ~~identification~~) license in accordance with (~~(RCW-66.20.180-and~~
10 ~~has-signed-a-certification-card-as-provided-in-RCW-66.20.180.~~

11 ~~Such-card-in-the-possession-of-a-licensee-may-be-offered-as~~
12 ~~a-defense-in-any-hearing-held-by-the-board-for-serving-liquor-to~~
13 ~~the-person-who-signed-the-card-and-may-be-considered-by-the-board~~
14 ~~as-evidence-that-the-licensee-acted-in-good-faith))~~ section 15 of
15 this 1983 act.

16 NEW SECTION. Sec. 13. There is added to chapter 43.09 RCW
17 a new section to read as follows:

18 The auditor shall periodically review the accounts of state
19 agencies and entities of local government to determine if there
20 is adequate support for the calculation of costs related to the
21 use of alcohol as required under section 14 of this act.

22 When such costs cannot be substantiated or are increased for
23 services required and expenditures from the liquor revolving fund
24 have been in excess thereof or are insufficient for authorized
25 services, subsequent apportionment from the fund to that agency
26 or entity shall be reduced or increased an equivalent amount.

27 NEW SECTION. Sec. 14. There is added to chapter 66.08 RCW
28 a new section to read as follows:

29 (1) The moneys distributed from the liquor revolving fund
30 to the state and to local governments under RCW 66.08.180 through
31 66.08.220 to defray costs resulting from alcoholic beverage sale
32 and the consumption of alcohol shall be expended pursuant to the
33 principles and guidelines set forth in this section.

34 (2) The costs to state and local government resulting from
35 alcohol consumption include, but are not limited to:

1 (a) The state and local government costs of operating or
2 supporting facilities for alcoholics under chapter 70.96 RCW;

3 (b) Support of alcoholism and intoxication treatment programs
4 under chapter 70.96 RCW;

5 (c) The costs of welfare payments or any other support to
6 alcoholics and the dependents of alcoholics.

7 (3) The costs to state and local government resulting from
8 use of alcohol include, but are not limited to:

9 (a) That portion of the total state patrol budget which
10 represents the fraction of time spent by officers involved in
11 arresting, processing, and testifying in court against persons
12 charged with driving or in control of vehicles while under the
13 influence of intoxicating liquor, or persons charged with other
14 offenses but who claim drunkenness as part of their defense,
15 compared with the time spent by officers arresting, processing,
16 and testifying against all other offenders:

17 (b) The budgets of local law enforcement agencies shall be
18 divided in the same manner as for the state patrol under (3)(a)
19 of this section.

20 (c) Each branch of the judicial system in the state shall
21 calculate the portion of time spent on cases where the use of
22 alcohol is a factor in the crime or as part of the defense,
23 compared with all other cases;

24 (d) The amount of time teachers and school officials spend
25 involved with students under the influence of alcohol as a
26 percentage of total teaching time would be assessed against the
27 school's budget.

28 (4) The office of financial management shall assist agencies
29 and entities of local government in calculating the percentage of
30 budgets spent to defray costs, under the principles of this
31 section, stemming from the use of alcohol.

32 NEW SECTION. Sec. 15. There is added to chapter 66.28 RCW
33 a new section to read as follows:

34 (1) No person, unless exempt under subsection (2) of this
35 section, may purchase liquor for personal use unless such person

1 has a valid license for such purchase in his or her possession.

2 (2) Persons in the following categories, who present valid
3 evidence thereof under RCW 66.16.040, shall be exempt from the
4 requirements of this section:

5 (a) Persons possessing licenses or permits to purchase
6 liquor from another state where fees and/or profits from the
7 regulation of liquor sales are used in part to meet some of the
8 resulting effects of its use, by reciprocity. The liquor control
9 board shall determine which states meet this requirement;

10 (b) Foreign nationals: or

11 (c) Active members of the armed forces, coast guard, or
12 merchant marines.

13 (3) Liquor user licenses shall be sold only by the director
14 of licenses in the same manner and from the same offices as
15 drivers' licenses and identicards are sold.

16 (4) The director of licenses shall provide by rule procedures
17 for modifying motor vehicle drivers' licenses and identicards
18 issued under chapter 46.20 RCW by distinctive color and/or design
19 so that such license or card may also constitute evidence that the
20 holder thereof is licensed to purchase liquor for personal use.

21 (5) The liquor user license shall expire on the same date
22 as does the person's driver's license or identicard. The fee for
23 a liquor user's license shall be five dollars for a two-year term
24 or ten dollars for a four-year term and subject to review and
25 adjustment annually to cover administrative costs plus a
26 proportionate share of total costs of problems pursuant to
27 purchase and consumption of alcoholic beverages to state
28 government. All moneys collected by the department of licenses
29 under this section shall be deposited in the liquor revolving
30 fund.

31 (6) No person shall be issued a liquor user's license unless
32 proof of liability insurance in force is presented.

33 NEW SECTION. Sec. 16. There is added to chapter 66.28 RCW
34 a new section to read as follows:

35 (1) The costs of implementing this act shall be spread over

1 a five-year period. Based upon costs estimated by the state
2 auditor and the state office of financial management, payments to
3 state and local governments shall be as follows:

4 (a) For fiscal year 1985-'86, approximately twenty percent
5 of payments made shall be from the liquor revolving fund and
6 eighty percent of payments from appropriations made from the
7 general fund;

8 (b) In each of the four subsequent fiscal years, the amount
9 paid from the liquor revolving fund shall increase by approximately
10 twenty percent additional per year, with an equal decrease in
11 payments made from the general fund. In fiscal year 1989-'90, one
12 hundred percent of payments made shall be from the liquor revolving
13 fund.

14 (2) Adjustments to revenue and apportionments shall be made
15 with the cooperation of the state auditor, the office of financial
16 management, and the liquor control board.

17 (3) The legislature and the liquor control board shall
18 cooperate with adjoining states to achieve the highest degree of
19 reciprocity as possible.

20 NEW SECTION. Sec. 17. This act shall take effect on
21 July 1, 1985.

RESOURCES FOR ALCOHOL INFORMATION AND ASSISTANCE

The following categories of resources serve to illustrate the kinds of help available in most major cities and states throughout the United States.

A. INFORMATION AND REFERRAL SERVICES

Alcoholics Anonymous
Room 301, 915 East Pine
Seattle, WA 98122 (323-3606)

Al-Anon and Alateen
PO Box 12061
Seattle, WA 98112 (363-7747)

Bainbridge Island Community
Alcohol Center
c/o Paulsbo Information and
Referral Center (779-2900)

Central Area Community Alcohol
Center
905 East Columbia
Seattle, WA 98122 (322-2970)

Community Psychiatric Clinic
5355 Tallman NW
Seattle, WA 98107 (789-1121)

Eastside Community Alcohol Center
UNI-C Building, 924 104th NE
Bellevue, WA 98004 (454-1505)

Eastside Community Mental Health
Center
2253 140th NE
Bellevue, WA 98005 (747-9000)

B. RESIDENTIAL TREATMENT PROGRAMS

Initial contacts should be made with a referral facility before contacting a treatment facility. These programs usually incorporate a live-in environment, support groups, counselling, recreation, and socialization services.

Harborlight
416 2nd Avenue
Seattle, WA 98104
623-6228 (206)

Pioneer Center
9236 Renton So.
Seattle, WA 98118
722-2993 (206)

Public Inebriate Program
107 Cherry
Seattle, WA 98104
682-6355 (206)

The Salvation Army
Men's Social Service Dept.
1000 4th Avenue So.
Seattle, WA 98134
624-0200 (206)

C. INTENSIVE CARE TREATMENT FACILITIES

These treatment programs require inpatient residence lasting from two to nine weeks.

ALCENAS
Alcoholism Center Associates, Inc.
10240 NE 132nd
Kirkland, WA 98033
822-1269 (206)

Beacon Hill Veterans Hospital
4435 Beacon Avenue S.
Seattle, WA 98108
762-1010 Ext. (206)

Highline-West Seattle Mental Health
Center
PO Box 66398
Seattle, WA 98148 (433-5750)

Seattle Indian Alcoholism Program
732 Broadway
Seattle, WA 98122 (324-5400)

Mental Health North
1600 NE 150th
Seattle, WA 98155 (365-5550)

North Community Alcohol Center
8537 Phinney Avenue North
Seattle, WA 98103 (789-1616)

Queen Anne Branch of Seattle-King
County Council on Alcoholism
Community Alcohol Center
1530 Queen Anne Avenue North
Seattle, WA 98103 (623-8380)

Seattle Mental Health Institute
1605 17th Avenue
Seattle, WA 98122 (329-5400)

Southeast Community Alcohol Center
232 South 2nd, Titus Building
Kent, WA 98031 (852-7954)

Southwest Community Alcohol Center
128 SW 153rd
Seattle, WA 98166 (242-3506)

Valley Cities Mental Health Center
2704 "I" Street NE
Auburn, WA 98002 (854-0760)

For more information 24 hours a day anywhere in King County,

Dial: A-BOTTLE

CABRINI ALCOHOL PROGRAM
St. Frances Cabrini Hospital
920 Terry Ave.
Seattle, WA 98104
623-4254 (206)

CAREUNIT
Riverton Hospital
12844 Military Rd. S.
Seattle, WA 98163
244-0180 (206)

CEDAR HILLS
Alcoholism Treatment Center
15825 228th Ave SE
Maple Valley, WA 98038
228-5115 (206)

SCHICK'S SHADEL HOSPITAL
12101 Ambaum Blvd. SW
Seattle, WA 98146
244-8100 (206)

STONEWALL
1808 18th Avenue
Seattle, WA 98122
324-8280 (206)

STUDIO CLUB
9010 13th NW
Seattle, WA
782-2030 (206)

D. DETOXIFICATION

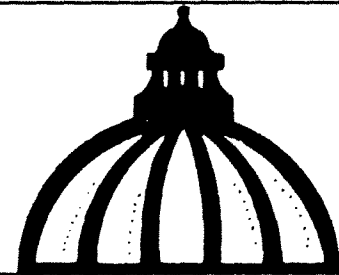
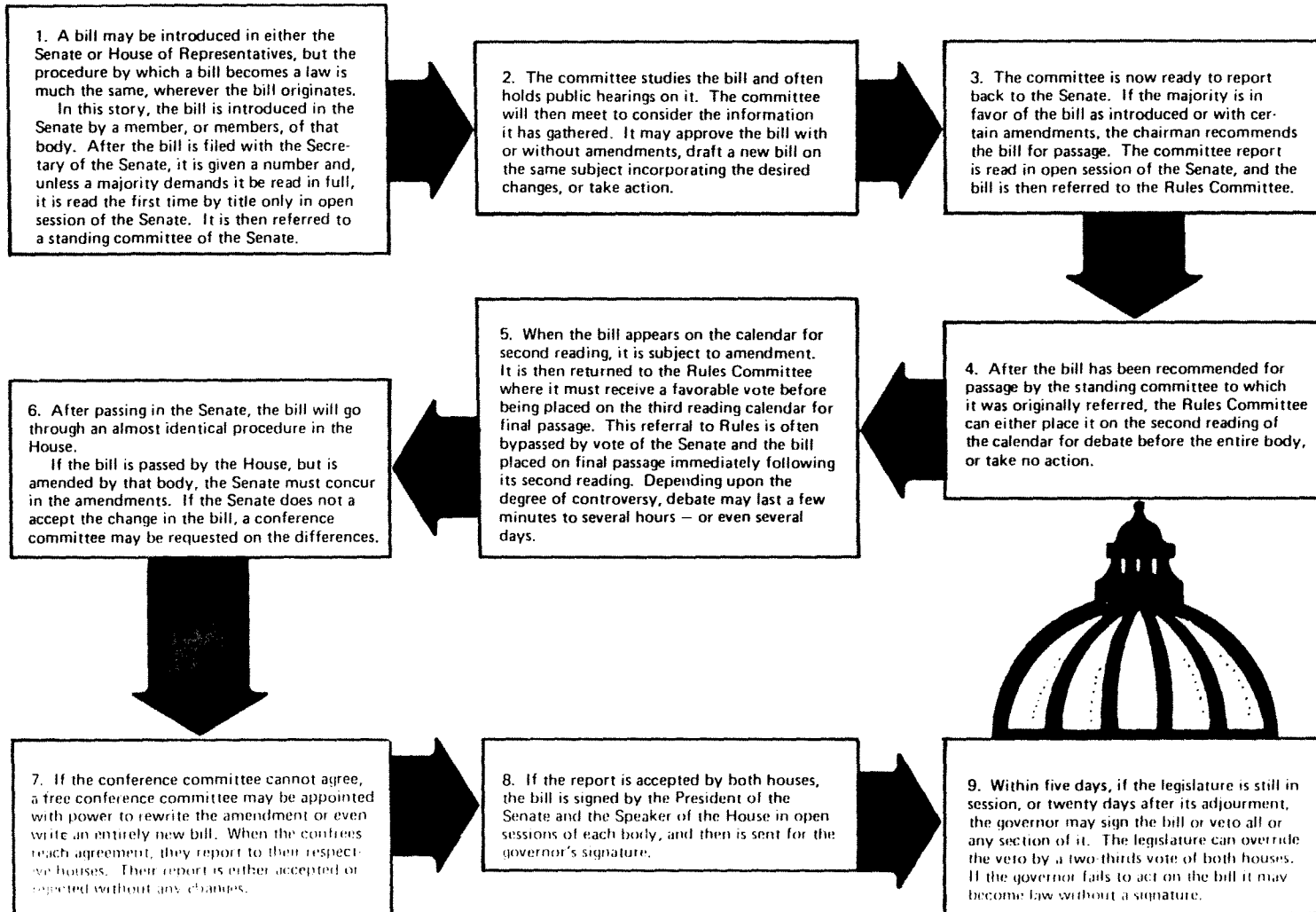
This service is usually activated through the criminal - justice system. It incorporates a drying-out with referral to a treatment facility.

King County Alcoholism Treatment
Facility - DETOXIFICATION CENTER

Admissions Through:

24 Hour Emergency Service for
Alcoholism
Harborview Emergency Room
223-3107

HOW A BILL BECOMES A LAW



[illegible]

*The above procedure for a non-committee bill introduced in the Senate is the simplest possible; neither vote nor amendment has occurred. If such a bill is introduced in the House, the Chief Clerk would perform essentially the same functions as the Secretary of the Senate as indicated above, and the action of the Senate thereon would occur after passage thereof by the House.

NOTES

CHAPTER TWO

- ¹ Thomas F. A. Plaut, Alcohol Problems: A Report To The Nation (New York: Oxford University Press, 1967, p. 3.
- ² The World Book Encyclopedia, "Alcohol", 1959 Ed., Vol. I, p. 202.
- ³ Webster's Seventh New Collegiate Dictionary, p. 243.
- ⁴ The World Book Encyclopedia, Vol. I, p. 203.
- ⁵ Plaut, p. 3.
- ⁶ Plaut, p. 4.
- ⁷ Joanne Buhl Auth, ed., Alcohol World, "Estimating The Prevalence Of Problem Drinking And Alcoholism In The General Population", Vol. 7, No. 2, 1982-83, p. 11.

CHAPTER THREE

- ¹ The World Book Encyclopedia, "The Human Body", Vol. 2, p. 858.
- ² _____, Vol. 2, p. 858
- ³ "Alcohol In The Human Body", A 16 mm Film, Davis Productions, Los Angeles, California.
- ⁴ The World Book Encyclopedia, Vol. 2, p. 957.
- ⁵ _____, Vol. 8, pp. 3341 - 3346.
- ⁶ _____, Vol. 14, pp. 6888 - 6890.
- ⁷ _____, Vol. 15, p. 7734.
- ⁸ _____, Vol. 11, pp. 5340 - 5342.
- ⁹ _____, Vol. 15, pp. 7488 - 7490.
- ¹⁰ _____, Vol. 3, p. 1447.

CHAPTER FOUR

- ¹ Seattle Post Intelligencer, 27 February 1984, p. 1.
- ² The World Book Encyclopedia, "The Science Year", 1979 Ed., p. 177.
- ³ "Alcohol And Red Flares", A 16 mm Film, Davis Productions, Los Angeles, California, n.d.
- ⁴ King County Coroner's Record, Washington State, 7 July 1968.
- ⁵ Dr. Max Schneider, "The Medical Aspects of Alcohol", The University of California, College of Medicine, 1982, p. 2.
- ⁶ _____, p. 3.
- ⁷ _____, p. 3.
- ⁸ The World Book Encyclopedia, "The Stomach", Vol. 15, p. 7734.
- ⁹ Schneider, p. 3.
- ¹⁰ _____, p. 4.
- ¹¹ _____, p. 14.
- ¹² _____, p. 5.
- ¹³ _____, p. 5.
- ¹⁴ _____, p. 6.
- ¹⁵ Keith Ryan, Alcohol World, "Alcohol And Blood Sugar Disorders", Vol. 8, No. 2, Winter 1983/84, p. 6.
- ¹⁶ _____, p. 5.
- ¹⁷ _____, p. 5.
- ¹⁸ _____, p. 5.
- ¹⁹ The World Book Encyclopedia, "The Science Year", 1979 Ed., p. 173.
- ²⁰ _____, p. 172.
- ²¹ James E. Royce, Alcohol Problems And Alcoholism, The Free Press, Macmillan Publishing Co., New York, 1969, p. 52.
- ²² The World Book Encyclopedia, "The Science Year", 1979, p. 176.
- ²³ Schneider, p. 10.

- 24 The World Book Encyclopedia, "The Science Year", 1966, p. 132.
- 25 _____, Vol. 2, p. 841.
- 26 Royce, p. 59.
- 27 Schneider, p. 12.
- 28 _____, p. 12,
- 29 Listen, Journal of Better Living, Vol. 22, No. 12, p. 2.
- 30 Reader's Digest, "Alcohol And Your Brain", June 1970, p. 65.
Reader's Digest Association, Pleasantville, N.Y.
- 31 The World Book Encyclopedia, Vol. 2, p. 960.
- 32 _____, p. 960.
- 33 Cyril B. Courville, Effects of Alcohol on the Nervous System of Man, San Lucas Press, Los Angeles, 1955, p. 29.
- 34 _____, p. 30.
- 35 James J. O'Donnell, Alcohol World, "Alcohol, Drugs, and Spinal Cord Injury", Vol. 6, No. 2, Winter 1981/82, p. 27.
- 36 _____, p. 29.
- 37 James E. Royce, Alcohol Problems, p. 62.
- 38 World Book Science Year, 1982, p. 117.
- 39 _____, p. 118.
- 40 "Alcohol's Effect On The Brain", H.A.S.T.E. Ministries, Seattle, Wa., n.d.
- 41 Royce, p. 60.

CHAPTER FIVE

- 1 Royce, p. 10.
- 2 _____, p. 160.
- 3 The Bottom Line, Vol. 5, No. 4, Winter 1983, p. 27.
- 4 The U.S. Journal, Vol. 8, No. 3, March 1984, p. 1.

- ⁵ Royce, p. 26.
- ⁶ "Here's Looking At You - A Teacher's Guide," Educational Service District No. 110, Seattle, WA. 1976, p. 48.
- ⁷ Alcohol World, Vol. 6, No. 1, Fall 1981, p. 45.
- ⁸ Royce, p. 65.
- ⁹ Robert L. Hammond, Almost All You Ever Wanted To Know About Alcohol, American Business Men's Research Foundation, Lansing, Mich., 1978, p. 28.
- ¹⁰ "The Seattle Times", Friday, 23 March, 1984, p. D-3.
- ¹¹ Cherry Lowman, "Drinking And Driving Among Youth", Alcohol World, Vol. 7, No. 2, Winter 1982, p. 42.
- ¹² Sandy Golden, Driving The Drunk Off The Road, Acropolis Books Ltd., Washington, D.C., 1983, p. ix.

CHAPTER SIX

- ¹ Psychology, Webster's Seventh International Dictionary, p. 689.
- ² John Dollard, "Drinking Mores Of Social Classes," Alcohol Science And Society, Yale Summer School, New Haven, 1959, p. 96.
- ³ Thomas Plaut, Alcohol Problems, Oxford University Press, New York, 1967, p. 134.
- ⁴ Albion Roy King, Basic Information On Alcohol, Narcotics Education, Inc., Washington D.C., 1953, pp. 28-48.
- ⁵ Diana M. DiNitto, "Drinking Patterns of Mentally Retarded Persons," Alcohol World, Vol. 8, No. 2, Winter 1983, p. 40.
- ⁶ Peter Nathan, "Research On Human Behavior", Alcohol World, Vol. 8, No. 1, Fall, 1982, p. 50.

CHAPTER SEVEN

- ¹ Royce, p. 310.
- ² The Bottom Line, "Liquor Liability Laws", Vol. 5, No. 4, Winter 1983, p. 4.
- ³ Joseph V. Fisher, M.D., "Family Physicians", Alcohol World,

Vol. 8, No. 1, Fall 1983, p. 10.

⁴ Elise Willson, "Volunteering: Challenges And Rewards", Alcohol World, Vol. 6, No. 3, Spring 1982, p. 11.

⁵ Ralph S. Banay, "Alcohol And Aggression", Alcohol Science And Society, Yale Summer School, New Haven, 1957, p. 147.

⁶ Edward G. Baird, "Controlled Consumption", Alcohol Science And Society, 1957, p. 165.

CHAPTER EIGHT

¹ "Intervention", Alcohol World, Spring 1981, p. 42.

² _____, p. 43.

³ E. G. McGavram, "Key Issues In Prevention of Alcoholism", Division of Behavioral Problems, Pennsylvania Dept. of Health, Harrisburg, 1963, p. 56.

⁴ "The Nature of Prevention", Alcohol World, Vol. 6, No. 3, Spring 1982, p. 55.

⁵ Robert L. Hammond, The Bottom Line, Alcohol Research Information, Lansing, Michigan, Vol. 5, No. 4, 1983, p. 6.

BIBLIOGRAPHY

Books

- Courville, Cyril B. Effects of Alcohol on the Nervous System of Man. Los Angeles: San Lucas Press, 1955.
- Dollard, John. Alcohol Science And Society. New Haven: Yale Summer School, 1959.
- Fort, Joel. Alcohol: Our Biggest Drug Problem, McGraw Hill, New York, 1973.
- Fort, Joel. The Pleasure Seekers. New York City, New York: Bobbs Merrill Co., 1969.
- Golden, Sandy. Driving The Drunk Off The Road. Washington, D.C.: Acropolis Books, 1983.
- Hammond, Robert L. Almost All You Ever Wanted To Know About Alcohol. Lansing, Mich.: American Business Men's Research Foundation, 1978.
- King, Albion Roy. Basic Information On Alcohol. Washington, D.C.: Narcotics Education, 1953.
- Moses, Donald A. Are You Driving Your Children To Drink? New York City, New York: Van Nostrand Reinhold Co., 1975.
- Plaut, Thomas F. A. Alcohol Problems: A Report To The Nation. New York City, New York: Oxford University Press, 1967.
- Raths, Louis. Values And Teaching. New York City, New York: Charles E. Merrill Publishing, 1966.
- Royce, James E. Alcohol Problems And Alcoholism. New York City, New York: Free Press, MacMillan Publishing Co., 1969.

Brochures

- "Alcohol's Effect On The Brain", H.A.S.T.E. Ministries, Seattle, WA. n.d.
- "Alcohol Interaction", Smith, Kline, and French Laboratories: Philadelphia, Penn., 1974.

Films

- Alcohol And Red Flares. Los Angeles: Davis Productions, n.d.
- Alcohol In The Human Body. Los Angeles: Davis Productions, 1965.
- Just One. Washington, D.C.: Narcotics Education, Inc., 1970.
- Medical Aspects. Irvine, California: University of California, 1969.

Magazines

- Auth, Joanne Buhl. Alcohol Health And Research World. "Estimating The Prevalence of Problem Drinking And Alcoholism In The General Population", Vol. 7, No. 2, 1982-83.
- Finklestein, Norma. Alcohol Health And Research World. "Alcoholic Mothers And Guilt", Vol. 6, No. 1, Fall 1981.
- Hammond, Robert L. The Bottom Line. Vol. 5, No. 4, Winter 1983.
- Listen, Journal Of Better Living. Washington, D.C.: Narcotics Education, Inc., Vol. 22, No. 12.
- Lowman, Cherry. Alcohol World. "Drinking And Driving Among Youth", Vol. 7, No. 2, Winter 1982.
- Nathan, Peter. Alcohol World. "Research On Human Behavior", Vol. 8, No. 1, Fall, 1982.
- O'Donnell, James J. Alcohol World, "Alcohol, Drugs, And Spinal Cord Injury", Vol. 6, No. 2, Winter 1981/82.
- "Per Capita Alcphol Consumption", The U.S. Journal, Miami: Vol. 8, No. 3, March 1984.
- Reader's Digest. "Alcohol And Your Brain", June, 1970, Pleasantville, New York: Reader's Digest Association, 1970.
- Ryan, Keith. Alcohol World. "Alcohol And Blood Sugar Disorders", Vol. 8, No. 2, Winter 1983/84.
- Willson, Elise. Alcohol World. "Volunteering: Challenges And Rewards", Vol. 6, No. 3, Spring, 1982.

Manuscript

- "Here's Looking At You - A Teacher's Guide". Seattle, WA.: Educational Service District No. 110, 1976.

Mc Gavram, E. G. "Key Issues In Prevention of Alcoholism", Division Of Behavioral Problems, Harrisburg, Pennsylvania: Dept. of Health, 1963.

Schneider, Dr. Max. "Medical Aspects Of Alcohol". Irvine, California: University of California, 1982.

Newspapers

Post Intelligencer, (Seattle). 27 February 1984, p. 1.

Seattle Times, (Seattle). 23 March 1984.

References

"Psychology", Webster's Seventh International Dictionary. Springfield, Massachusetts.: G. C. Merriam Company, Publishers, 1967.

The World Book Encyclopedia. Vol's. I, II, III, VIII, X, XI, XIV, XV, XIX. Chicago, Illinois: Field Enterprises, 1959.

The World Book Encyclopedia. "The Science Year" Chicago, Illinois: Field Enterprises, 1979 and 1980.

The World Book Encyclopedia. "The Year Book". Chicago, Illinois: Field Enterprises, 1964, 1965, and 1967.