DUBIOUS DENTISTRY

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A Dental Continuing Education Course

By

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DUBIOUS DENTISTRY SERIES

PART ONE:	SCIENTIFIC vs. NONSCIENTIFIC HEALTH CARE
PART TWO:	DUBIOUS DENTAL PRACTICES
PART THREE:	DENTAL PSEUDONUTRITION
PART FOUR:	QUACKERY: A NATIONAL SCANDAL

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PART ONE

SCIENTIFIC VERSUS NONSCIENTIFIC HEALTH CARE PROVIDERS

THE NATURE OF HEALTH CARE A Business Enterprise A recent case A Clinical Practice Empiricism Art A Scientific Endeavor A Profession versus a Guild The Structure of a Scientific Health Profession **CLINICAL PITFALLS & ILLUSIONS** Post hoc ergo propter hoc Selective affirmation Reactive effects (placebo) Placebo myths Medical Student's Disease A Lesson from History SCIENCE AND ITS RIVALS What is Science? Misconceptions About the Nature of Science A body of knowledge Logical thinking Science is not technology A Functional Definition of Science The Human Factor in Science An Art-Science Split or Different kinds of scientists? **Belief** personalities **Rivals of Science** What Science and Its Rivals Attempt To Do Describing the nature of reality Predicting the future Explaining how and why things happen Folkways and common sense experience vs. science Religion vs science Superstition and Magic vs science **Pseudosciences** How people fool themselves in believing pseudosciences are valid The appeal of the pseudosciences Steps to believing Science versus Pseudoscience: Similarities Differences between Science and Pseudoscience Steps to objectivity CONCLUSION

Questions

DUBIOUS DENTISTRY

Introduction

The dictionary defines <u>dubious</u> as "questionable as to value..." (<u>Webster's New</u> <u>Collegiate Dictionary</u>). The term has been chosen to categorize questionable practices performed either by dentists or nondentists claiming to benefit dental problems. The word "dubious" is selected because it is not our purpose to label every practitioner who employs the techniques described as quacks or frauds, nor to imply that they are necessarily defective in either character or intelligence.

The author is not a dentist, but has been engaged in dental education since 1973. For about a decade, the author taught general research methods to dental graduate students, and served as a primary reviewer for nearly all dental research at Loma Linda University School of Dentistry. On the undergraduate level, he has taught biometrics (i.e., evaluating scientific literature and statistics, nutrition, public health dentistry, community health principles to predoctoral and dental hygiene students. For four years he served as chairman of the Curriculum Committee of the LLU dental school.

As a teacher of the scientific method, he believes that it is inadequate to merely teach good scientific methodology. It is also important to examine improper methodology to enable practitioners to recognize such methods to avoid inadvertently employing them. Experience has taught that many <u>pseudoscientists</u> have been well-intended individuals who have pursued what they believed were <u>plausible</u> ideas--utilizing improper methods of evaluation--until they could not extricate themselves from the morass of pseudoscience or the <u>ego-traps</u> they created for themselves.

Simply stated, the purpose of learning improper research methodology along with valid methods is to <u>avoid fooling ourselves</u> in our well-intended attempts to find out what is appropriate in dental health care. This unique approach to teaching research methodology was adapted from safety education where it was found that a major impediment to changing behavior was the belief that accidents <u>only happen to others-not to me</u>. Understanding how accidents happen allows people to see an accident in the making. Likewise, recognizing the pitfalls, into which would-be scientists can topple, helps well-intended practitioners from falling prey to faulty methodology.

SCIENTIFIC VERSUS NONSCIENTIFIC HEALTH CARE PROVIDERS

The Nature of Health Care

This series deals with what may be indiscriminately called "quackery." Some deserves the label, but some may not. It is more useful to view dubious dentistry as <u>scientific</u> versus nonscientific health care. Health care delivery is a human undertaking and is subject to human imperfection. It involves distinct aspects as a (1) business enterprise; (2) clinical practice; and, (3) scientific endeavor.

A Business Enterprise.

Health care delivery is a business enterprise with goals, needs and mechanisms similar o all businesses. Health care enterprises must be financially sustained. Some type of marketing strategy must be employed. The need for some kind of trade associations exists. Unfortunately, some outsiders view health care as simply another kind of business and nothing more. Health professionals differ from tradesmen in important ways. The more health care is perceived as merely another type of business the more vulnerable it becomes to attack by nonscientific health care providers (NHCPs) utilizing business standards and laws.

The charge that scientific health care has a "monopoly" in the United States is a rallying theme among nonscientific providers. Today, NHCPs They are attempting to make the most out of the Federal Trade Commission's ruling on advertising by health professionals. NHCPs have sought to use provisions of the Sherman Antitrust Act to force scientific health care to recognize them. Ethical health care providers must be keenly aware of the important differences between the business enterprises of health professionals and mere guilds of practitioners, and constantly guard against an erosion of the principles of professionalism that the daily pressures of maintaining a business can bring.

A recent case. Although the Sherman Antitrust Act exempts scientific activity, a controversial court decision in 1986 has placed a cloud over the ability of professional organizations to discourage associations with nonscientific practitioners. The case involved chiropractors obtaining an injunction against the American Medical Association requiring it to notify its of a 1977 revision of the AMA Code of Ethics stating that collaboration with chiropractors per se was no longer unethical behavior but a matter for individual MDs to decide for themselves.

In order to issue the injunction, the judge had to believe that the AMA's ethical prohibition of association with nonscientific practitioners violated the Sherman Antitrust Act--a law designed to regulate business, not scientific enterprises. The AMA argued that its action was done with to safeguard the scientific aspects of patient care. Judge Susan Getzendanner ruled that in order for the patient care defense to exempt AMA from Sherman that it had to prove that it its concern for the scientific aspects of patient care was: (1) genuine; (2) the dominant motivating factor; (3) reasonable; and (4) least restrictive of competition.

The AMA succeeded on the first two requirements, but was unable to convince the judge that its action was reasonable and the least restrictive means it could have used. The Getzendanner decision has given encouragement to NHCPs. It is also being touted by those who seek the deregulation of health care by removing the requirement that health care providers be licensed by the state.

A Clinical Practice.

Health care delivery is a clinical practice with practical goals of patient satisfaction, relief of pain, reassurance, improving function, care and comfort. There is much art and empiricism in clinical care.

Empiricism. No matter how scientific a health care system becomes, there will always be an important place for empiricism. [Note: The term <u>empiricism</u> should not be confused with its use in reference to observational vs theoretical approaches to ways of looking at the world--which is the basis for science--rather, in its classical sense: "....medical practice founded on experience without the aid of science or theory;" (Webster's New Collegiate Dictionary). Empiricism was standard practice in the prescientific era and continues to make up a large part of nonscientific health care practice still.

Traditionally, empiricism has been credited with accidental discoveries in health care, and NHCPs commonly complain that regulating health care stifles innovation thus impeding medical progress. Accidental discoveries in medicine are part of folklore, but Kornberg's analysis of how medical advances have actually occurred disputes the idea. Kornberg cites good evidence that most medical advances come through systematic effort, and not by accidental discovery (Kornberg A. "Research the lifeline of medicine," <u>New Engl J. Med</u>, 294:1212-1216, 1976). In reality, no laws prohibit innovative empiricism, but practitioners are required to proceed responsibly by doing such as applying for Investigational New Drug approvals before proceeding with clinical investigations.

Art. The art of patient care involves style and what is done to meet patients' emotional needs. Many of the same clinical practices that make quacks successful may be employed by legitimate health care providers. The main differences between quacks and legitimate clinicians is that the latter are to know when they are employing art and empiricism versus proven procedures. Not to know is to engage in an unacceptable form of "double blind" practice in which neither the clinician nor the patient is aware of what is really happening. Further, legitimate practitioners use art to enhance clinical care, not to exploit unwary or desperate patients.

A Scientific Endeavor.

It is the scientific aspects of health care that justifies human imperfections inherent in the business and clinical dimensions. Empiricism may help lead to advances in health care or it may cause practitioners "down the primrose path" for a while, but the scientific process provides a way to test the value of practices and enables clinicians to discard those procedures that only appeared to work.

A Profession versus a Guild.

The dictionary defines a <u>guild</u> as "an association of men with similar interests or pursuits" (<u>Webster's New Collegiate Dictionary</u>). True health professions differs from mere guilds of health care providers by the following:

- 1. Professionals support and/or engage in scientific research that is aimed at eliminating the diseases within their scope of practice.
- 2. There are no trade secrets among professionals. Information on methods and procedures is shared openly.
- 3. Professionals work to make their patients as self-reliant as possible, discouraging dependency behavior.
- 4. Professionals open themselves up to critical peer review and accountability.
- 5. Professional associations engage in consumer protection.

Responsible health care providers need to be critically aware that the scientific aspects of health care seem to count for very little in the political process which governs health care. This is attested to by the fact that every legislature in the United States has legalized nonscientific health practices within their jurisdictions. It is further affirmed by the fact that the U.S. Department of Education does not use a commitment to the scientific process as a criterion to whether or not it recognizes an agency of accreditation for the training of health care providers for a particular guild of practitioners (Letter from J.R. Proffitt, Director, Accreditation and Institutional Eligibility Staff, Bureau of Postsecondary Education, U.S. Office of Education, February 18, 1975). Therefore, due to the fact that the scientific aspect of health care is the most important to the validity of health care, but least important from the perspective of health care politics, financial success and patient satisfaction, it is in the greatest need of protection.

The Structure of a Scientific Health Profession. Figure 1 diagrams the pyramidal structure of a scientific health profession:





(Abler, et al. "The origins of science," in Spatial Organizations. Englewood Cliffs: Prentice-Hall, Inc., 1971.)

A sound health care delivery system rests on a solid clinical base, it does not teeter on a philosophical tip. To be complete all levels must be present because each makes its essential contribution. Each also has inherent weaknesses.

At the apex of the pyramid are the philosophers who are the guardians of the profession and the concept of science. They are essential to the process, but they are the farthest removed from the practical world of people.

Theorists, who seek to explain the way things work are next on the pyramid. Theorization is may be the least understood part of the scientific process. Theories should not be confused with hypotheses. Theories are arrived at <u>post hoc</u> (i.e., after the fact) while hypotheses are predictive. Contrary to popular thinking, theories are not

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immutable nor are they merely unproven speculations. Theories are subject to revision as new evidence emerges. Theories are intellectually seductive and some people "fall in love" with them without understanding why. Theories always "make sense" because they are conceptual models developed <u>post hoc</u> (i.e., after-the-fact) by uniting the greatest number of observations, employing the fewest possible assumptions, into the simplest mechanism possible.

The post hoc reasoning of theorists can be appreciated by an incident in which two biology students queried their professor for a theory for the behavior of field mice "Voles behave altogether differently when threatened by attack from above (voles). depending upon the location of their burrow," the students stated, "woods-dwelling voles freeze motionless when a shadow mimicking a hawk passes over them, while fielddwelling voles run for cover." "That is easily explained," said the professor, "the woods vole is obscured by trees and shadows, but running motion would likely bring attention to him. The field vole has no forest canopy to obscure the vision of hawks and must rely upon speed and the protection of the burrow." Rechecking their notes, the students exclaimed, "Oh, we got it backwards, the woods vole runs and the field vole freezes!" "That behavior is also easily explained," replied the professor, "the woods vole uses the fact that the forest canopy obscures the vision of hawks making it possible for him to run for cover; field voles must rely upon the camouflage of their coloration and remain motionless lest movement call attention to them." Both theories make perfect sense because they merely create a story that explains the observations--after the fact. A practical example of the role of theories can be heard almost daily as analysts state why the stock market went the way it did on that particular day.

Next on the pyramid are the methodologists who determine how to measure parameters, construct the testable hypotheses and design the studies which test ideas and procedures, and so forth. Included at this level are the clinical investigators who must test the laboratory findings on real people. Methodologist sometimes must impose conditions upon an experiment that limit the practical usefulness of its findings.

Finally, on the front lines are the practitioners who must confront the real world of human suffering and deliver care. Clinicians employ a great deal of empiricism in their care of patients. This is as it must be. It is essential, however, that they remain keenly aware of the pitfalls they face when attempting to analyze the cause and effect mechanisms involved in the conditions they treat. Because clinical goals are more practical and direct (i.e., to relieve pain and restore function) clinicians are in danger of losing its precious objectivity in the need to bring relief to human suffering.

CLINICAL PITFALLS & ILLUSIONS

If you have seen only in others the vulnerability to faulty beliefs, you have missed the main point. Everyone is vulnerable. Our best protection lies in the diligence of the scientific process and the community of fellow scientists who share our desire to accurately understand the way things really work.

Post hoc ergo propter hoc. This latin phrase says: "after it, therefore, because of it," and refers to the common fallacy of crediting improvement B with treatment A merely because B follows A. It is probably the best known of all clinical pitfalls, but it is still done in every before and after set of pictures. Sometimes A is responsible for B, but improvements can only be credited to the treatment when all other factors that can lead to a perception of improvement have been controlled. Included are <u>variations</u> in the natural course the condition may take.

Selective affirmation. One of the major strides forward in the evolution of the scientific method was the discovery of the laws of mathematical probability that is taught as "statistics." Unfortunately, too many focus upon the so-called "measures of central tendency," particularly the means and the medians. If something is not "average" it is not considered "normal"; if a finding is not normal, it is considered unusual and "significant." In fact, the great lesson of statistics is <u>variability</u>. That is to say that people respond to disease and treatment in a wide variety of ways. Most people are not at the mean. A clinician should expect to see above average, below average, and occasionally unusual results as a matter of normal course.

Selective affirmation is the process of selectively affirming what one has come to expect, or believe is true, by collecting all of the positive findings while ignoring or rationalizing away the outcomes that don't reinforce the belief. It is a process so subtle that one need not be strongly biased or fraudulent. It is the way our perceptions operate normally. Our sensory mechanisms appear to be designed to do selectively affirm. The common experience of noticing cars very much the one we are driving at the moment exemplifies this natural human quality. The only way to avoid selective affirmation is by employing objective, controlled studies.

Reactive effects. Reactive effects refer to patient responses when they are <u>aware that</u> they are being treated or observed. To avoid reactive effects patients must be treated surreptitiously which sometimes cannot be done for legal or ethical reasons.

- (1) <u>Hawthorne effect</u>. Improvements due to the dynamics of knowing that one is being observed or participating in a study. People try harder.
- (2) <u>Rosenthal effect</u>. The tendency of respondents to give observers what they perceive it is that they want. People like to please those they like or respect.
- (3) <u>Social expectation effect</u>. People tend to respond in a manner that is consistent with social values. They are apt to under report drinking and overindulgence and over report eating good foods, exercising, hygienic practices, medication compliance, and so forth.
- (4) <u>Effect of special places/people</u>. Traveling to a famous clinic or being seen by a famous clinician can cause patients to respond favorably for a while.
- (5) <u>Observer bias</u>. Reactive effects can also effect the way observers see things. Expectation can cause biased observations (seek and ye shall find whether it is there or not!). Nonblinded observers jeopardize the validity of any experiment.
- (6) <u>Placebo effect</u>. The most famous of all reactive effects is the placebo effect which is poorly understood by many clinicians. A placebo effect is a favorable response due to the <u>act of treatment</u> rather than the treatment itself. Any of the above mechanisms may be involved in a placebo response:

Placebo myths.

Myth: A placebo response proves that the patient's problem is imaginary. Fact: Placebo responses may occur in patients with real disorders; subjective symptoms can resolve while objective factors remain (see Table 1).

Myth: The placebo effect can be explained by a single mechanism of action. Fact: The placebo effect is merely a favorable response to the act of treatment rather than the treatment itself. Placebo responses may involve one or more of a number of mechanisms of action. Included are: cultural context, environmental milieu, instruction, suggestion, preparation, doctor-patient relationship, expectation, personality. psychological state, severity of symptoms, severity of discomfort, anxiety, cognitive framework of patient, self-perceptions, belief, conditioning, social learning, symbolic processes, imagination, covert rehearsal, and more (White et al, "Possible determinants of placebo response: a list," in Evans F. "Unravelling placebo effects," Advances, Institute for the Advancement of Health, 1:(3):11-33, 1984).

The power of different kinds of placebos is worthy of further study. The clinical usefulness of placebos could be enhanced by knowing the effects of such factors as routes of administration (ie, pill, injection, laying on of hands), identification of responders and nonresponders, how long various placebo effects may last, how long individual susceptibility lasts, verification of various theorized mechanisms, and so forth. It is essential that researchers separate the placebo response per se from theorized mechanisms of action if they wish to understand the complex phenomenon of "the placebo effect."

Myth: A patient must believe in the therapy for a placebo effect to occur. Fact: Belief in the treatment may or may not play a role; belief appears to explain only

a portion of placebo responses. (Branthwaite A, Cooper P. <u>British Medical Journal</u>, 282:1576, 1981). In addition to belief, operant conditioning and suggestibility appear to play important roles. Neher (Figure 2) diagrams the effects of previous positive responses to effective procedures may condition a patient to respond favorably to the "appearance" of an effective procedure. The power of suggestion was dramatically demonstrated in a report of a man being tested on a treadmill who experience pain and exhibited marked S-T segment depression on an ECG at 44 crossings of a Master two-step test. Subsequently, when the number was miscounted so he exercised less, the same pain and marked S-T depression occurred at the precise count of 44; however, the pain did not occur at that level if the count was accurate at the lower level (Lown. <u>American J. Cardiol.</u>, 40: 1977).



Figure 2. The Placebo Effect

Neher A. <u>The Psychology of Transcendence</u>, Engelwood Cliffs: Prentice-Hall, 1980)

The often expressed notion that unproven therapies are justified by their possible placebo value is too simplistic. Proven therapies also have a placebo effect in addition to their real therapeutic effects.

Condition	Study	Place Agent	ebo Route*		Patients	: - - 1	& Satis- factorily Relieved by a
Severe post- operative	Keats, A.S., and Beecher, H.K.: J. Pharmacoi. & Exper. Therap.	Saline	1.7.		118		21
	Beecher, H.K., & others: U.S. Armed Forces M.J. 2:1269-1276,1951 Keats, A.S. & others: J.A.M.A. 147:1761-1763 (Dec. 29) 1951	Saline	s.c.		29		31
		Saline	Ι.Υ.		34		26
	Beecher & others (1953) ³	Lactose	P.0.		52 36 44		40 26 34 34
	Lasagna & others (1954) ⁴	Saline	s.c.		40 14 20 15 21 15 15		32 50 37 53 40 40 15
Cough	Gravenstein, J.S., & others: J. Appl. Physiol. 7:119-139, 1954	Lactose	P.0.		22 22		36 40 43
Drug-induced mood changes	Lasagna, L. & others: J.A.M.A. 157:1006-1020 (March 19) 1955	Isotonic	S.C.	Normal "Post- addicts	20 30		30 30
Pain from angina pectoris	Evans, W., & Hoyle, C.: Quart. J. Med. 2:311-338, 1933	Sodium bicarbo- nate	P.0.				38
	Travell, J., & others: Ann. New York Acad. Sc. 52:345-353. 1949	"Placebo"	P.0.		19		26
	Greiner, T., & others: Am. J. Med. 9:143-155, 1950	Lactose	P.0.		27		38
Headache	Jellinek (1946)	Lac†ose	P.0.		199		52
Sensickness	Gay & Carliner (1949)	Lactose	P.0.		33		58
Anxiety and Tension	Wolf & Plasky (1954)	Lac†ose	P.0.		31		30
Experimental cough	Hillis (1952)	lsotonic sodium chloride	s.c.	Many ex- periments	1		37
Common cold	Diehl, H.S.,: J.A.M.A. 101:2042-2049 (Dec. 23) 1933	Lac†ose	P.0.	Cold acute Subacute chronic	110 48		35 35
				Total patients	1,082	Average relieved	35.2 <u>+</u> 2.2%

Table One

Therapeutic Effectiveness of Placebos in Several Conditions

*I.V., intervenous; S.C., subcutaneous; P.O., oral

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(Beecher. JAMA, 12/24/55).

Myth: Placebos are harmless.

- Fact: Placebos can lead to harm in several ways:
- (1) Placebo responses can "teach" chronic illness through operant conditioning by confirming and/or reinforcing the delusion of imagined disease.
- (2) Patients may become dependent upon treatment by nonscientific practitioners employing placebo measures. The Minnesota Multiphasic Personality Inventory can be used to identify a type of patient who thrives on this type of dependency. These patients exhibit a "conversion-V profile" in which they are high in <u>hysteria</u> and <u>hypochondria</u>, but low in <u>depression</u>. This means that they are suffering from their condition, but that it doesn't depress them in the way that chronic disorders normally do. Their disorder has become an effective coping device which enable them to avoid unpleasant experiences by having a flare-up. Such patients may suffer form imagined "reactive hypoglycemia," "allergies," chronic back disorders (termed "back derelicts"), "yeast infection," and more recently, "amalgam toxicity."
- (3) Placebos can blind practitioners to real disease by convincing them that the patient's condition is only imagined. For both patient and practitioner to be blind to the clinical realities is an unacceptable version of "double-blind" (pun intended)!
- (4) The use of placebos can undermine the doctor-patient relationship by introducing deception on the part of the care-giver.

Bourne states that "A placebo effect need not always be beneficial and may be frankly toxic; dermatitis medicamentosa and angioneurotic endema have resulted from placebo therapy. More subtle but equally important negative placebo effects must occur when the physician himself, by virtue of a moment of inattention, a raised eyebrow, or a transient look of disgust, loses the trust of his patient." (Bourne H. "Unrecognized Therapeutic Measures, Including Placebo," in Editors Melmon KL and Morrelli HF, <u>Clinical Pharmacology</u>, New York: Macmillan Company). Negative reactions to the act of treatment rather than the treatment itself has been called **the <u>nocebo</u> effect** (Lambert C, "The Chopra prescriptions," <u>Harvard Magazine</u>, p.27, Sept-Oct., 1989).

Medical Student's Disease. The fascinating interactions of the power of suggestion, expectation and clinical interpretation can be seen in the common experience of medical students who come to feel the symptoms of whatever disease they are currently studying. In his discussion of this phenomenon, Mechanic describes a study by Schacter and Singer ("Cognitive, social, and psychological determinants of emotional state," Psychol Reviews, 69:379-399, 1962) in which subjects were told that they were testing a new vitamin compound. Subjects were given either adrenalin or saline placebo. The subjects given adrenalin either were told nothing about what symptoms to expect (ignorant), told correctly (heart pounding, hand tremor and flushed face) or incorrectly (numbness and itching). Still another variable was introduced by the presence of a confederate who would act like the treatment either made him angry or euphoric. Subjects who received adrenalin without correct information (particularly the misinformed) were most affected in their behavior and feeling states cued by the confederate.

Schacter and Singer believe that the clinical emotional response involves a two-stage process requiring physiological arousal and a definition of it. They maintain that the same internal state can be labeling in a variety of ways, resulting in a variety of emotional reactions. External influences on definitions of internal states are particularly important when persons lack an appropriate explanation of what they are experiencing. (Mechanic D., <u>New Engl J Med</u>, 286:1132-1140, 1972) It is easy to see how even well-intended clinicians can fall into the traps subjectivity and personal experience expose them to. No wonder it was said that:

skepticism in the physician is the best means of arriving at the truth; faith in the patient the best means of arriving at health. (Tuke DH. <u>Illustrations of the Influence of the Mind Upon the Body in Health and Disease: Second Edition</u>, London: J&A Churchill, 1884, p.287.)

A Lesson from History,

The placebo effect was no doubt responsible for many of the benefits observed in patients during the prescientific era. However, it would be a disservice to physicians of the past to permit the continuance of the belief that they were not aware of the psychological value of therapies. The famous story of Dr. Elisha Perkins' metallic tractors is both an American medical classic and instructive about the scientific ability of Eighteenth Century medical men. The substitution of fake wooden tractors for the magnetic metal tractors promoted by Perkins proved that their effects were not real. The title of the monograph exposing the error tells much. It was: <u>Of the Imagination as a Cause and as a Cure of Disorders of the Body; Exemptified by Fictitious Tractors and Epidemical Convulsions</u> (Haygarth J, London: Cruttwell, 1800).

SCIENCE AND ITS RIVALS

What Is Science?

<u>Science</u> is a word with many meanings. According to <u>Webster's New Collegiate</u> <u>Dictionary</u> science may be defined as: "the possession of knowledge as distinguished from ignorance," "knowledge attained through study or practice," "a department of systematized knowledge as an object of study (eg, the science of theology)," "knowledge concerned with the physical world and its phenomena," "a system or method based or purporting to be based on scientific principles," and others. Dictionaries define words according to the way they are commonly used which may or may not correspond to the precise meaning used by experts. What is presented here is the meaning ascribed to science as it is employed in health care.

Misconceptions About the Nature of Science.

Science is a lot of guys in tweed suits cutting up frogs on foundation grants. -- Woody Allen --

<u>Science is a body of knowledge</u>. A major product of science is the body of knowledge that it develops, however, this feature is not unique to science. Every field of endeavor, be it art, philosophy or pseudoscience, develops a body of knowledge about itself. Some notable guotes on the nature of science:

...science is a group of findings and <u>methods</u> that everyone can use with some success to simplify the world's paradoxes. (Teller. <u>The</u> <u>Pursuit of Simplicity</u>, Malibu: Pepperdine Press, 1980).

The idea of science as a <u>method</u> rather than a body of knowledge is not widely appreciated outside of science, or indeed in some corridors inside of science. (Sagan. <u>Broca's Brain</u>, New York: Ballantine, 1980).

<u>Science is logical thinking</u>. Logic involves inductive and deductive reasoning, and science certainly involves these, but logic precedes science by several millennia. Logic is rooted in philosophy and every philosophical system employs it. The ancient Greeks were magnificent logicians, but still held very quaint notions about the real world which included egocentrism, a flat earth, and cosmological metaphysics. Even the most primitive superstitions adhere to logic once certain basic assumptions are accepted by believers.

<u>Science is not Technology</u>. Science should not be confused with technology. Science is the process whereby people determine what is true in the natural world. Technology is "applied science" (<u>Webster's</u>). Technology has been called "the handmaiden of science" because of the ability of modern technology to improve methods of observation and measurement.

It is important to distinguish between science and technology because much of what passes as critical of science--and fodder for antiscience movements--is actually complaint about abuses of technology. Technology can be misapplied to hurt people and destroy the environment. Society usually turns to science to correct abuses by technology. As the means of determining what is true in the natural world, it is arguable to ever see science as misguided.

A Functional Definition of Science.

A definition of <u>science</u> that emphasizes its human dimension is: "science is a way of arriving at and advancing beliefs." Belief differs from mere factual knowledge by the

fact that knowledge must be incorporated into an individual's larger world view to make sense. Science's uniqueness is the <u>process</u> used to arrive at its knowledge, the degree of emotional attachment it has to its <u>beliefs</u>, and the way its beliefs are advanced.

The safety of science depends upon there being men who care more for the justice of their methods than any result obtained from their use. (Cohen and Nagel. <u>An Introduction to Logic and Scientific Method</u>, New York: Harcourt, Brace, Janovich, 1934.)

(The) scientific method...settles differences without any external force by appealing to our common rational nature. (Cohen and Nagel, 1934)

Anyone can use the scientific process to arrive at and advance beliefs; and contrarily, anyone--no matter how scientific they usually are--can deviate from the process. "Scientist" is not a special class of persons, but a label anyone can merit as long as they behave in a scientific manner. Every health care provider should make his/her understanding and appreciation of the scientific method a life-long study.

the development of the scientific method and the growth of the edifice of science are the greatest group achievements of mankind....Science is the only group activity that seems, at present, of indefinite improvement and advancement because it builds upon a provable base. (Menard. <u>Science: Growth and Change</u>, Cambridge: Harvard Univ. Press, 1971)

The most unequivacol functional expression of what constitutes science in the health field is encoded into law in the United States Food, Drug and Cosmetic Act. Its definitions and requirements leave no doubt about what constitutes a food, drug, cosmetic, or medical device. Its requirements of premarketing proof of both safety and effectiveness for an intended purpose, with proponents bearing the burden of proof, is unambiguous and consistent with the principles observed by scientists in the basic field of chemistry, physics, biology, and related fields. Although health care providers are regulated by states and not the FD&C Act, nevertheless, the Federal law controls many of the tools of health care thus imposing its standards upon health care.

The Human Factor in Science.

Science is a human enterprise. Humans are creatures more of feeling than rationality.

A scientist has the same psychological make up of a nonscientist. He is a scientist only within his narrow field of expertise. A scientist differs from a nonscientist in the same way a chess player differs from a non-chess player. (Teller E. <u>The Pursuit of Simplicity</u>. Malibu: Pepperdine Press, 1980)

Human intellectual endeavor is classically divided into the <u>arts</u> and <u>sciences</u>. Both require creative-thinking and problem-solving abilities. Both endeavors require abstract and concrete thinking--recently popularized as "right and left brain" activity. Einstein acknowledged:

When I examined myself and my methods of thought, I came to the conclusion that the gift of fantasy has meant more to me than my talent for absorbing positive knowledge. (Einstein A. <u>Ideas and Opinions</u>, New York: Dell Publishing, 1954)

An Art-Science Split or Different kinds of scientists?

C.P. Snow described the differences in the art-science split as "two groups-comparable in intelligence, identical in race, not grossly different in social origin, earning about the same incomes, who had ceased to communicate at all" (Jones L, "The two cultures: a resurrection," <u>The Skeptical Inquirer</u>, Fall, 1989). Lewis Jones believes that Snow missed the real difference by not understanding that the word <u>science</u> is used with two separate meanings, and that people tend to slide from one to the other without warning. <u>Science-1</u>, he says, is a method of problem-solving that is synonymous with scientific thinking. It is the "hypothetico-deductive method" of guess and test. Most important, it is not beholden to any particular subject matter.

The more popular view of science is that it consists of subject matter areas such as physics, chemistry, biology, and so forth. Jones calls this <u>science-2</u>. He points out that there are scientific thinkers whose daily work does not deal with science-2 subjects, and there are professional scientists unable to handle science-1. "Science-1 still cannot rely upon support from exponents of science-2," he adds.

Even the enterprise of getting to the moon is described as largely a science-2 effort. A joint project of savants whose individual areas of expertise were extremely limited.

One savant who knew a great deal about the propellant properties of solid fuels but little about the guidance capabilities of small computers, another savant who knew a great deal about the guidance capabilities of small computers but virtually nothing about the gravitational effects on moving objects, and so forth. . . those savants included people who believed that redheads are hot-tempered, who bought their last car on cocktail party advice...

What Jones describes is the disturbing and confusing phenomenon of personalities who are known as "scientists," including Nobel Prize winners, who become promoters of pseudoscience. For instance, Andrew Ivy, an eminent medical educator, became the leading advocate of Krebiozen in the 1960's. Krebiozen turned out to be several different substances of which the original was simply mineral oil ("Krebiozen and Carcalon," in <u>Unproven Methods of Cancer Management</u>, New York: American Cancer Society, 1971). Usually these misguided "scientists" are working out of their fields, but it is possible for a science-2 person working within his or her field to fall prey to pseudoscience due to a lack of aptitude for science-1.

We need to recognize that reliable information (ie, knowledge) is in very limited supply compared to the great demand human beings have for it. This "need to know" is just as easily met by beliefs. Beliefs do not have to be correct, they merely have to satisfy the limits of our present knowledge and permit us to proceed with a degree of confidence. If actions taken work for the problem at hand, the belief is reinforced in the same way that feeding a dog conditioned by a bell did for Pavlov. Understanding something about the way beliefs function is important for people engaged in the scientific enterprise (ie, Jones' science-1).

Belief Personalities. We often label people to be: <u>agnostics</u> (unbelievers), <u>skeptics</u> (closedminded), <u>gullible</u> (will swallow anything), <u>true believers</u> (zealots), and so forth. A brief examination of these <u>belief personalities</u> can provide insight into the human factor in science.

Figure 3. Belief Personalities

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The term "agnostic" was coined by Thomas Huxley who modified "gnostic" (knower) to label himself as unable to believe in something that cannot be known--in his case, the existence of God. Huxley is not alive to question, but it would be interesting to ask him about other unknowable beliefs such as the origins and infinity of both time and space. It is difficult to imagine a human being who can exist without beliefs, relying solely upon what can be known.

The dictionary defines <u>belief</u> as "a state of... mind in which trust or confidence is placed in...something," and <u>know</u> as "to be aware of the truth or factuality of." The words <u>know</u>, <u>believe</u>, and <u>think</u> are listed as having a "shared meaning element: to hold something in one's mind as true..." (<u>Webster's New Collegiate Dictionary</u>). Despite the fact that someone may feel so strongly about a belief that they may declare that the "know" that it is true, semantics permits us to differentiate between provable facts and beliefs based entirely upon faith. Rather than: "I cannot know, therefore, I cannot believe," a more realistic definition of "agnostic" appears to be: "I cannot know, therefore, I can <u>only</u> believe." Let us call this "neoagnosticism." Neoagnosticism helps us differentiate between beliefs based upon factual knowledge and those held by faith alone. It also helps us keep separate scientific versus philosophical-religious concepts that serve us in different ways.

The label "skeptic" is often applied to doubters, especially anyone who has doubts about religion. Skeptics are commonly viewed as closedminded by believers. However, closedmindedness charges cut both ways. People committed to philosophical health care systems--especially those rooted in ancient cosmologies--are far more rigid than scientists who are forced to revise their worldviews with new discoveries. "Skeptic" finds its origins but in the Greek word skeptomai which merely meant to "look at something carefully" and "examine" and "consider" it (Funk. Word Origins, New York: Bell Publishing, 1978). The word examine is rooted in skopein meaning "to view" as one does with a telescope or microscope. "Skeptic" was first applied to followers of Pyrrho who talk his followers to be Zetetics, or "skeptical seekers" of truth--to be open to new ideas but demanding of evidence before accepting them. This describes the healthy skepticism that marks the proper attitude of a scientist.

Skepticism may also be confused with cynicism. Classical cynicism A cynic is: "a faultfinding captious* critic; especially: one who believes that human conduct is motivated wholly by self-interest." [*"calculated to confuse, entrap, or entangle in argument: marked by an often ill-natured inclination to stress faults and raise objections." (Webster's New Collegiate Dictionary).] One of the saddest findings in an in-depth study of dental education was the dramatic rise in cynicism after the sophomore year (Sherlock b and Morris R. Becoming A Dentist, Springfield: Charles C. Thomas, 1972). Medical students also are said to become more cynical than students of other professions (Kopelman L. "Cynicism among medical students," JAMA, 250:2006-2010, 1983).

A 1986 national study conducted by Louis Harris and Associates for the U.S. Department of Health and Human Services found that academic education increases the likelihood that someone will use questionable health products, and that attitudes of distrust play an important role. It is possible that we teach cynicism in a vain attempt to teach skepticism. Cynicism can poison the mind; skepticism aids in the discovery of truth.

"Gullible" is a label given to those we perceive as fools impossible to protect from their folly. It denotes a total lack of skepticism. It is usually unfairly applied, after the fact, as a way of blaming victims for the harm that has befallen them. Although the normal magical thinking of children makes them credulous about Santa Claus and the Easter Bunny, mature people are not at all gullible. In fact, most people are very skeptical--even cynical--when faced with new propositions that are likely to cost them money. The failure to recognize pseudoscience or quackery is not gullibility, but a lack of knowledge and experience with the thing they are attempting to evaluate. Its difficult to differentiate between cooperative and compliant "good patients," and the cooperative victims of medical quacks whom we label "gullible." The latter merely chose to trust the wrong health care providers.

"True believers" are characterized by their unshakable faith in beliefs that reasonable people would abandon in the face of obvious disconfirmation. In abnormal psychology, the field which studies the pathology of human belief systems, the term <u>delusion</u> is employed. Delusion is characterized by the holding to false beliefs that persist despite the facts. An example from abnormal psychology, in which the patient's delusion is that he is dead, illustrates how to recognize delusionary beliefs:

Psychiatrist to deluded patient: "Do dead men bleed?" Deluded patient: "No, dead men do not bleed." Psychiatrist (to strongly make his point): "Why, don't dead men bleed?" Patient: "Because our hearts don't beat and our blood doesn't circulate." Psychiatrist: "You are correct!" (He then pricks the patient's finger which bleeds.) Patient exclaims: "Well, what do you know--dead men <u>do</u> bleed!"

This case reveals how deluded people deal with reality versus facts. In this case, the patient's <u>reality</u> was that he was dead. The <u>fact</u> was that dead men do not bleed. Faced with the fact that he bled, he had to either change his delusion or the fact. Unwilling to abandon his delusion, the patient changed the fact. Paranoid grand delusion is a classical type of psychosis. All of us, no doubt, hold petit delusions, such as the "wait until next year" slogan of sports fans regarding their favorite team's championship capabilities. The problem is that it is nearly impossible to identify one's own delusions due to the very nature of the process. This is one reason why religion and politics make such poor conversational topics!

Rivals of Science

Once we accept science as a way of arriving at and advancing beliefs, it is helpful to examine other ways people arrive at and advance beliefs. Other ways include:

- (1) folkways (i.e., common sense and daily experience);
- (2) superstition and magic;
- (3) religion;
- (4) pseudosciences-including the pseudopsychologies.

What Science and It Rivals Do

Science and its rivals all attempt to perform three fundamental tasks: (1) describe the nature of reality; (2) explain how and why things happen; (3) predict the future. Science's rivals are clearly better at satisfying human emotional needs due to the limitations science deliberately places upon itself. Franz Inglefinger, the late great editor of the <u>New England Journal of Medicine</u> used the term <u>trans-scientific</u> in reference to "questions which arise in or around science, which can be stated in the language of science, but are unanswerable by science--(because) they transcend science" (<u>New Engl. J. Med.</u>, 303:1508-1509, 1980).

Describing the nature of reality. When describing the nature of reality science is condemned by its rivals as merely <u>materialistic</u>, while they are able to deal with the <u>ethereal</u> ("lacking material substance") and <u>metaphysical</u> ("supernatural"). Science does not reject the unseen, but is limited to what can be demonstrated. Subatomic particles have not been seen, but their existence has clearly been demonstrated in cyclotrons, linear accelerators and other devices of nuclear physics.

<u>Organizing and categorizing phenomena</u>. To enable adherents to access huge amounts of information, science and its rivals must classify the phenomena that make up its universe. The ancient Greeks listed four elements (earth, air, fire and water), four directions (north, south, east and west), four phases of the moon ("quartering"), and so forth. The ancient Chinese organized their world around five elements (earth, water, fire, metal and wood), five directions (north, south, east, west and center), five planets (Mars, Jupiter, Venus, Saturn and Mercury), and so on. The Greeks sought to balance four humors (blood, black bile, phlegm and yellow bile) while the Chinese balanced two forces (yin and yang). Hippocrates used four classifications of personality (choleric, sanguine, phlegmatic, melancholic--which are still sometimes used by psychologists) while astrologers (pseudopsychologists) use the twelve signs of the zodiac to categorize individuals.

Ancient efforts at organizing their views of the universe appear quaint by modern standards, but they also can appear to offer great insight into human nature and have emotional appeal if studied in detail. For instance, the Greeks made associations between the four elements, numerology, music, gymnastics, healing, literature and the arts. The earth element was thought to be cube shaped with twelve edges. The musical intervals were divisible by twelve. Music was alleged to be for the soul what gymnastics was for the body. Music was valued for creating certain moods of vigor and virtue. Dance was gymnastics to music; gymnastics led to a healthier, more aesthetically pleasing body--a model for artists to sculpture; song united poetry (literature) and music; "The Pythagoreans used music to purge the souls even as they used herbs to purge the bodies" (Sarton G. <u>A History of Science</u>, New York: WW Norton & Co., p.217, 1952).

As appealing as this cosmological approach to organizing all facets of experience can be, cosmology is not scientific:

Science, as we understand it, concerns itself with limited objects, and it owes its success and immense fertility to its deliberate and severe restraint. Cosmology is the opposite: it deals with the whole universe, and therefore, irrespective of the amount of scientific ingredients which he may include in his survey, the cosmologist is to be judged a metaphysician rather than a man of science. (Sarton G. <u>A History of Science</u>, New York: WW Norton & Co., p.420, 1952)

Predicting the future. People engaged in business, politics and health care all need to make predictions about the future. However, for some reason discussing future prediction more quickly conjures up thoughts of supermarket tabloid headlines such as "Psychic Predictions for the New Year" or a gypsy fortune teller hunched over a crystal ball. According to the <u>Skeptical Inquirer</u>, the accuracy of predictions by tabloid psychics revealed only a .05% performance record. Despite their 99.5% failure record, every New Year the tabloid headline psychic predictions for the year. The year-to-year continuance of this sham shows that some human need is being met by it.

Fortune tellers usually are poor Gypsies living in a run-down part of town, while insurance companies are prosperous businesses. Both rely upon their abilities to

predict the future for their livelihoods. One uses intuition and magic, the other uses predictive statistics. No self-proclaimed psychic has ever employed his/her talents to win a lottery or foresee bull or bear stock market performances.

Futurologists attempt to make rational predictions about the future. They often write best sellers such as <u>Future Shock</u> or <u>Mégatrends</u>. These writers often provide us with a great deal of insight about what is happening on the cutting edge of society today, but no evidence has been presented that confirms their long range capabilities. A review of the utopian (world's fair models) or catastrophic (Orwell's <u>1984</u>) predictions will show that most people are guessing. The factor that makes future prediction nearly impossible are the unforeseeable breakthroughs in science and technology that can vastly alter the course of things (Dimond G. <u>JAMA</u>, 236:2085-2088, 1976; & Olson SH. <u>The Depletion Myth</u>. Cambridge: Harvard University Press, 1971).

Explaining how and why things happen. Analysts say that all questions can be subsumed under six categories: Who, What, When, Where, How, and Why? Questions posed as why are often how questions in disguise. "Why did the airliner crash?" really asks "how did the airliner come to crash?" How question deal with cause and effect. Why questions are ultimately unanswerable because they can be followed by another why question until the mechanics of cause and effect are exhausted and only philosophical and theological answers remain. Science can only answer the how question, and can only offer probability as an explanation for why (Abler R, et al. "The origins of science," in Spatial Organizations. Englewood Cliffs: Prentice-Hall, Inc., 1971).

The ability of a rival of science to better satisfy emotional needs is presented by Goldstein and Goldstein in a comparison of witchcraft versus a scientific explanation of an accident in Zandeland:

In Zandeland sometimes an old granary collapses. There is nothing remarkable in this. Every Zande knows that termites eat the supports ...and that even the hardest woods decay after years of service. ...a granary is the summerhouse...and people sit beneath it in the heat of the day. Consequently it may happen that they are injured....That it should collapse is easily intelligible, but why (emphasis mine) should it have collapsed when these particular people were sitting beneath it?

We say that the granary collapsed because its supports were eaten away by termites. That is the cause that explains the collapse of the granary. We also say that people were sitting under it at the time of the collapse because it was in the heat of the day and they thought it would be a comfortable place to talk and work. This is the cause of people being under the granary at the time it collapsed. To our minds the relationship between these two independently caused facts is their coincidence in time and space. We have no explanation of why the two chains of causation intersected at a certain time at a certain place, for there is no interdependence between them.

Zande philosophy can supply the missing link. The Zande knows that the supports were undermined by termites and that people were sitting beneath the granary to escape the heat and glare of the sun. But he knows why these two events occurred at a precisely similar moment in time and space. It was due to the action of witchcraft. (Goldstein M and Goldstein IF. <u>How We Know</u>, New York: Plenum Press, 1978).

It is easy to dismiss the need for the Zandes to supply a philosophical explanation for

why the accident occurred (i.e., someone put a hex on the victims) until we ourselves are faced with explaining a serious automobile accident involving someone close to us. That automobiles can be expected to crash from time to time is easily understood, but why it happens to some lovely, promising young person requires something more comforting than blind chance. Scientific explanations provide no comfort and may confront us with our own failings. Further, scientific explanations provide us with no reassurance but show us our inability to control circumstances and a realization that the same may occur again. Worse of all, the tragedy may have no discernable redeeming purpose and science will never remedy such a depressing feeling. Clearly, when it comes to meeting human emotional needs, science is a definite underdog. The clinical setting is a place in which such needs must be met. If they are not, the patient is likely to perceive that the practitioner has failed them.

Science appears to have enjoyed popular appeal over the last century which is often cited as evidence of mankind having become more rational. Historically, however, science and magic were inextricable parts of the same system (Hansen B. "The complementarity of science and magic before the scientific revolution," <u>The American Scientist</u>, 74:128-136, 1986). Science is often presented at World's Fair expositions and in commercial advertising as the best form of magic mankind has yet to discover. Computers, television sets, and program cameras are magic boxes; and, jetliners and automobiles are magic carpets to people who do not understand how they work but do know how to operate them--which is most of us.

Folkways and Common Sense Experience vs. Science.

Everyone admires and respects common sense--although, many homey philosophers have observed that it isn't all that common! What usually passes as folk wisdom often involve cliches that are opportunistically applied. Nearly every human situation has a folk-saying--or an opposite one--to fit the occasion.

"Out of sight, out of mind" vs. "absence makes the heart grow fonder."

"Nothing ventured, nothing gained" vs. "better safe than sorry."

"Two heads are better than one" vs. "if you want something done right, do it yourself."

"Birds of a feather flock together" vs. "opposites attract."

It is unfortunate that science is often seen as in opposition to common sense for one of the most appealing features of the scientific process is its practicality and rationalism. Einstein described science as merely a "refinement of everyday thinking." Milvy stated that "If appearance and reality were exactly the same things, there would be no need for science."

Nagel (<u>The Structure of Science</u>, New York: Harcourt, Brace & World, 1961) provides six ways that science improves upon ordinary common sense, paraphrased as follows:

(1) <u>Science defines, specifies and quantifies</u>. Most will agree with the statement, "good nutrition is important." But, what exactly is meant by "good nutrition?" Nutrition scientists define, specify and quantify good nutrition in terms of minimum requirements, Recommended Dietary Allowances, dietary planning models such as the USDA four-food groups, U.S. Dietary Guidelines, and so forth. Nonscientific "nutritionists" counter with terms such as "natural foods," "organic foods," or "health foods," which are either undefined or undefinable (Donegan TJ, et al. <u>Proposed Trade Regulation Rule on Food Advertising: Staff Report and Recommendations</u>, Washington, DC: Federal Trade Commission, 1978).

(2) Science sets limits upon how far a belief can be carried or applied. Once "good

nutrition has been defined, specified and quantified, it must next be determined what the limitations of good nutrition are. Will it prevent arthritis, cancer, dental caries, diabetes or heart disease, periodontitis? Will "good nutrition" cure any of these? Scientific health care works to determine the clinical value of its procedures as to their safety and effectiveness for preventing, alleviating, mitigating or curing specific conditions. Are procedures less risky than allowing the condition to go untreated, appearing to do something (placebo) or in comparison to some currently established procedure? Limitations are also based upon a benefit/risk assessment founded upon what is known about the natural history of the disorder. The benefit/risk equation exposes the fallacy of employing an high-risk procedure approved by the FDA for a serious malady for low-risk disorders. A key failing of NHCPs is their unwillingness to place limitations upon how far their beliefs can be carried or applied.

(3) <u>Science explains how things work</u>. The determination of cause and effect mechanisms is an ultimate goal for every health care procedure, but this is secondary to the clinical questions of safety and effectiveness for an intended purpose. Understanding how DNA-RNA work, genetic codes, oncogene function, and so forth, speeds up scientific progress, but these represent longterm achievements of extensive effort, not the norm. NHCPs often complain that their methods are not accepted by others because no one understands "how they work." The idea that procedures are not to be applied until their cause and effect mechanisms are known is untrue. For instance, aspirin was used for more than 70 years before its mechanisms of action were understood. Some mechanisms of action may never be known, but the use of a particular procedure is justified if it can be shown in controlled clinical trials that it is safe and effective for its intended purpose.

(4) Science systematizes to help eliminate inconsistencies in its beliefs. It is auite possible for humans to hold inconsistent, even conflicting beliefs. A classic example is our paradoxical beliefs in Primitivism vs. the Idea of Progress. Primitivism is the assumption that mankind is at its happiest, healthiest and most moral best when living in harmony with nature. This was the basis for Rousseau's concept of the Noble Savage. Historians say that the savagery of aboriginal people was shocking and disillusioning to many Europeans who regarded primitives as morally superior because they lived closer to nature. In direct conflict with primitivism is the Idea of Progress which conversely states that mankind is at its happiest, healthiest and most moral best when we use our intellectual power to take control of our world, organize social systems, economic affairs, and engage in science and technology. Whitney (Whitney L. Primitivism and the Idea of Progress, New York: Octagon Books, 1965) points out that these conflicting philosophical concepts have existed as far back as human ideas can be traced. We tend to apply these without concerning ourselves with their contradictions.

The scientific premise that the universe is consistent and governed by physical laws of cause and effect can lead science into fields where cause and effect are not as apparent--such as a study of accidents, earthquakes, or the weather, all of which still contain events dubbed by insurance companies as "acts of God." The application of scientific findings (technology) to areas traditionally believed to be under the direction of Providence is a major source of conflict in today's world (e.g., in vitro fertilization, organ transplants, use of fetal tissue).

(5) <u>Science deliberately neglects the immediate value of things</u>. Scientists appreciate the value of basic information about the natural order for its own sake. Kornberg (<u>New Engl J Med</u>, 294:1212-1216, 1976) points out that most of the significant advances in medicine resulted from basic research with no aim of attaining such advances. Common sense is very practical. Unless something has immediate value

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it is viewed as worthless. Although scientists place high value on the basic information gained about the nature of the solar system and physics, to maintain Congressional support, the space program must constantly be justified on the basis of the practical spin-offs forthcoming from its research. Anti-intellectualism finds canon-fodder in criticisms of this "knowledge for its own sake" aspect of science. An example of antiintellectualism was former Senator William Proxmire's infamous "golden fleece award" that he gave to scientists whose work he didn't appreciate.

(6) Science deliberately subjects itself to systematic scrutiny to determine the accuracy of its beliefs. The natural sensory process causes us to affirm our perceptions. We automatically see what we are attuned to see. A practical example of the way our eyes--actually minds--work can be illustrated by what happens when we are in a convertible with the top down and soon come to see a world of convertibles. Common sense beliefs and perceptions are reinforced until we are quite certain that our common subjective experience is a true reflection of reality. Science demands a very unnatural thing when it forces investigators to resist accepting the "seeing is believing " saw of common sense. It goes even further when it demands that scientists seek disconfirmation (i.e., attempt to disprove a hypothesis).

Religion vs. Science.

The existence of a conflict between religion and science is clear to some, but a matter of debate for others. Issues involving how far society should permit medical technology to go in conception or prolonging life often bring clerics into public debates with representatives of the scientific community. Scientists and creationists have recently faced-off in court over a legal requirement in Arkansas that Creationism be taught in high school science classes. Not everyone, however, agrees that the issues involved represented a basic conflict between religion and science. but the appropriateness of teaching a particular religious view in the name of science. Many scientists see no conflict between religion and science as long as each stays within its realm of expertise. Both religion and science impose upon each other's territory at their own peril. More than three hundred years ago Rev. Thomas Burnet warned:

Tis a dangerous thing to engage the authority of scripture in disputes about the natural world, in opposition to reason; lest item, which brings all things to light, should discover that to be evidently false that we had made scripture to assert. (<u>Natural History</u>, p.27, April, 1975)

More recently, Christopher Evans put the religion-science dichotomy more bluntly:

Who in this day and age, now that astronauts have waddled around the moon, can really feel that the Archbishop of Canterbury has anything important to say on celestial matters? (Evans. <u>Cults of Unreason</u>, New York: Farrar, Straus & Giroux, 1973).

Scientists must also tread carefully when societal moral values are at issue. These are determined more by tradition and consensus than pure rational thought. Einstein said of religion versus science:

Science can only tell what <u>is</u>, not what <u>ought to be</u> (emphasis mine). He believed that values and the evaluation of human though was in the domain of religion and outside of science. (Einstein A. <u>Ideas and</u> <u>Opinions</u>. New York: Dell Publishing, 1954)

Glick summarized the view that science and religion each have important contributions to make to mankind's well-being:

...science rose in the 20th century because it worked better than any other endeavor. Science...defeated religion in a frank and fair contest of miracles and wonders. Science also worked better against plagues ...proved inferensely better at flying and distant communication.... The question that must be asked, however, is whether science is also better than religion in training for moral behavior. (Glick. "Humanistic medicine in a modern age," <u>New Engl. J. Med.</u>, 304:1036 +).

Harvard geologist, Stephen Jay Gould, who is a champion among modern philosophers of science says, "If there is any consistent enemy of science, it is not religion but irrationalism." (<u>Natural History</u>, April, 1975)

Superstition and Magic vs Science.

In a discussion of superstition and magic as a rival of science, the first problem is one of definition. Deciding what deserves the label of superstition can merely be a matter of opinion. French philosopher Francois de Voltaire wrote:

It is hard to mark out the boundaries of superstition. A Frenchman traveling in Italy finds almost everything superstitious, and is hardly wrong. The Archbishop of Canterbury claims that the Archbishop of Paris is superstitious; the Presbyterians levy the same reproach against his Grace of Canterbury, and are in their turn called superstitious by the Quakers, who are the most superstitious of men in the eyes of other Christians. (Voltaire's Philosophical Dictionary)

The dictionary defines <u>superstition</u> as: "A belief or practice resulting from ignorance, fear of the unknown, or trust in magic or chance" (<u>Webster's 7th New Collegiate</u> <u>Dictionary</u>). <u>Magic</u> is defined as: "The use of means (as charms or spells) to have supernatural power over natural forces." Superstition and magic have been called "the religion of the ignorant" and is a universal feature of primitive belief systems. Before dismissing superstition and magic as unworthy rivals of science, we should see what we can learn from these ways of arriving at and advancing beliefs that may be helpful in our own efforts to avoid fooling ourselves.

Superstition and magic have survived because they are functional--they appear to work. An example can be found in primitive Eskimo culture. Eskimo survival is dependent upon a successful caribou hunt. The hunt occurs during the caribou migration. The problem is that the caribou may take any one of several alternate routes in any given year. Primitive Eskimo tribes had too few able bodied men to cover all of the routes. Disputes arose among the hunters as to precisely where they should set up their ambush. Without the Shaman's magical ritual they would break into factions, each one of which would set out on their own with too few men to successfully ambush a sufficient number of caribou. The Shaman united the group through a ritual in which he burned old caribou bones and "read" the ashes. This alleged to tell him where the migration would be. The group now starts out together. As they travel, the Shaman may adjust their course based upon scouting reports. As skilled hunters the group usually succeeds in their purpose, and in the end, nobody questions inconsistencies in what the shaman may have said or demeans the ritual which helped unite them in a successful hunt.

Human nature has a need that is fulfilled by superstition and magic. After a thorough examination of the phenomena, Jahoda concluded that: "Where chance and circumstances are not fully controlled by knowledge, man is more likely to resort to magic" (The Psychology of Superstition, Baltimore: Penguin Books, 1969). This

indicates that we shouldn't too surprised when usually rational, intelligent people resort to nonscientific--even magical--means when sound information isn't readily available.

Pseudosciences.

The dictionary is not very helpful in defining <u>pseudoscience</u>. It merely states: "A system of theories, assumptions and methods erroneously regarded as scientific." (Webster's New Collegiate Dictionary). A functional description of pseudoscientists is: "people who make a pretense of being scientific by using the language of science but not its rigorous methods and conservative inferences." Pseudoscientists speak of "theories," "research," "discoveries," "breakthroughs," "findings," and so forth, but do not define or quantify their variables, present testable hypotheses, use adequate numbers of subjects, randomize, use controls, blind observations, limit inferences, or write up replicable protocols. Pseudoscientists state presumptions about the nature of reality that must be accepted on faith. There are literally hundreds of pseudosciences. Some examples with their theoretical presumptions are:

<u>Iridology</u>. Wolf claims that, either by evolution or design, the body is equipped with a metering device functioning as a gauge of the health of the individual. The iris, he says, is a miniature recording screen with direct neural connection between its surface layers and the cervical ganglion of the sympathetic nervous system. He claims that there exists a "neuro-optic reflex" which conveys impressions from all over the body to the iris revealing pathological, structural and functional disturbances in the body. (Wolf. <u>Applied Iridology</u>, San Diego: national Iridology Foundation, 1979).

<u>Palmistry</u>. Chirognomy is based upon the presumption that shapes of the hand, thumb and fingers have significance. Chirosophy teaches that character traits are reflected in the lines of the hand. Palmistry combines chirognomy and chirosophy and claims that character and future health can be ascertained by reading these shapes and lines.

<u>Graphology</u>. Graphologists claim that a person's handwriting reveals important traits of character. The key is alleged to be in the way a person makes their strokes (i.e., degrees of slant, direction, lightness/heaviness, and much more). They alleged that the honesty and personality of prospective employees can be determined by examining the style of their handwriting.

<u>Moleosophy</u>. Moleosophy is based upon the hypothesis that moles can be interpreted as indicators of a person's character and also prognosticate generalities for the future. Location, shape and color are regarded as important.

<u>Numerology</u>. Numerologists believe that every number has a certain power beyond its quantitative value. This power rests in an occult connection between the relations of things and the principles of nature which numbers express.

How people fool themselves into believing pseudosciences are valid.

Every pseudoscience has a following of believers. To nonbelievers, these devotees may seem strange. However, to believe in a pseudoscience one does not have to be suffering from a mental deficit. Ray Hyman, Professor of Psychology at the University of Oregon who is an expert in the psychodynamics of the pseudosciences, says that anyone who will make an effort to learn about a particular pseudoscience and apply it according to its formula will come to believe, at least in part, that it has some validity. This is due to certain features which make pseudosciences attractive and self-validating.

Hyman applies the term <u>pseudopsychologies</u> to pseudosciences which claim to assess human character (personality) and, thus, provide a basis of predicting future behavior.

Like sciences, pseudopsychological systems categorize people and behaviors organizing them for utilitarian use. Psychologists have worked diligently at developing valid tests for assessing personality. Astrologers, palmists, graphologists and others have also worked at developing their methods of assessment. In fact, subjects have found the cleverly constructed descriptions made to apply to anyone (called "stock spiels") more personally applicable than the Minnesota Multiphasic Personality Inventory (MMPI) which is generally considered to be the most accurate of tools in psychological testing. The following stock spiel was given to a group of college students along with the results of their own MMPI tests.

Some of your aspirations tend to be pretty unrealistic. At times you are extroverted, affable, sociable, while at other times you are introverted, wary and reserved. You have found it unwise to be too frank in revealing yourself to others. You pride yourself on being an independent thinker and do not accept others' opinions without satisfactory proof. You prefer a certain amount of change and variety, and become dissatisfied when hemmed in by restrictions and limitations. At times you have serious doubts as to whether you have made the right decision or done the right thing. Disciplined and controlled on the outside, you tend to be worrisome and insecure on the inside. Your sexual adjustment has presented some problems for you. While you have some personality weaknesses, you are generally able to compensate for them. You have a great deal of unused capacity which you have not turned to your advantage. You have a tendency to be critical of yourself. You have a strong need for other people to like you and for them to admire you.

When asked which most accurately described their personalities, fifty-nine percent of the students chose the stock spiel. The more they believed the stock spiel was tailored for them, the high ratings they gave it as an accurate description of their personalities (Snyder CR and Shenkle RJ. "The P.T. Barnum Effect," <u>Psych Today</u>, 8:52-54, 1975).

The appeal of the pseudosciences. Carl Sagan points out that the appeal of the pseudosciences is very much like the appeal of real science. Both provide novelty and a feeling of insight and grandeur about the cosmos. A major difference is that science requires much more work than the pseudosciences which rely mainly upon belief in their presumptions and practical application on a personal level. Other features of pseudoscientific belief systems that make them appealing and serve to perpetuate them include the following:

(1) <u>They are complete systems</u>. Most pseudosciences incorporate metaphysics as well as mechanistics into their systems. They organize the world for us, provide exceptional insight, meet emotional needs by answering scientifically unanswerable questions, and even can anticipate our questions. This latter feature can be very impressive. As initiates proceed in their learning of an established pseudoscience, there is a natural progression as one question leads to insight, which leads to another questions. The ability of a veteran of the system to anticipate these as-yet-unasked guestions can make them appear almost clairvoyant.

(2) <u>They are highly adaptable</u>. Like the ancient Oracle at Delphi, the pseudoscience scan adapt themselves to apparent failures. History records the story of a military leader who was about to go against a superior army. Upon consulting the Oracle she muttered, "I see the defeat of a great army," which he took as a sign that he would win. When he was defeated, the Oracle said, "the army I saw defeated must have been his!" This "heads I win, tails you lose" psychology is widely practiced by

pseudoscientists.

(3) <u>They permit faulty self-validation</u>. Pseudosciences work on a very personal and subjective level. They permit people to selectively affirm features which fit themselves and ignore those which do not.

(4) <u>They are ego-enhancing</u>. Many pseudoscience provide reasons outside of ourselves to attach blame for perceived personal failings. They also offer hope for remedying personal problems.

(5) <u>They provide social support for beliefs</u>. Believers may be drawn together with others who share the system. These mutual admiration societies provide further validation for the system as others share their selectively affirming experiences and insights.

(6) <u>They provide a source of authority for resolving uncertainties</u>. Appealing to authority for answers to difficult questions is much easier than doing the kind of work demanded by the scientific method.

Pseudosciences generally take much less effort than the sciences. However, the amount of work it takes to learn a pseudoscientific health care system can be considerable. Chiropractors, who have the most organized formal system of training of all of the health care pseudosciences, are fond of comparing the hours they spend in training with medical students. Such a quantitative comparison overlooks the quality of their education, entrance requirements and its scientific basis. One could easily argue that the longer a student spends in pseudoscientific training, the more deluded are likely to they become.

Steps to believing.

There is a process of arriving at any belief-faulty or not. These steps are important to anyone promoting the adoption of beliefs and practices.

(1) <u>Acceptance of plausibility</u>. The primary feature of the belief process is accepting the plausibility of a proposition. Most people dismiss out-of-hand the presumptions of pseudosciences. Once they are willing to accept that the basic assumptions could be true, they are ready to be persuaded.

(2) <u>Acceptance of faulty validation</u>. Most people question new ideas. Unfortunately, their skepticism is usually only superficial. People too readily accept faulty validation such as testimonials, anecdotal evidence and unsubstantiated claims. Its not that people are stupid, but that they simply lack sufficient information on the technology involved or the way the human body works in health and disease. All of us regularly make decisions to buy products and services without full information. The ego is such that people are often willing to believe that they can judge the value of something based upon either the information they are given or rather quick character judgments about the trustworthiness of the individual presenting the idea.

(3) <u>Personal experimentation</u>. The willingness to give something a try is valued positively in our society. "It can't hurt," or the "nothing ventured, nothing gained" bit of folk wisdom makes this step relatively easy.

(4) <u>Faulty self-validation</u>. Subjective experience is very important. If a person perceives positive feelings, or is convinced that some improvement will eventually transpire, it is usually enough to validate the experience. It helps if few if any negative feelings are experienced, but practitioners can easily explain away adverse reactions

as positive evidence of the body's expulsion of toxins--which is common practice of pseudoscientists.

Science versus Pseudoscience: Similarities.

(1) <u>Creativity</u>. Creativity is found among artists, inventors, scientists, quacks, geniuses and madmen.

Creative ideas and insane ideas sometimes are sometimes are difficult to distinguish. Both represent a departure from the common and traditional ways of thinking; both are new and unique to the person. But there is also a difference. The creative idea has a basis in objective reality, even though the evidence to convince others is inadequate; in contrast, the product of the insane mind is made of elements derived largely from internal stimulation, such as hallucinations and imagined events. (Maier. <u>Problem Solving and Creativity</u>, Belmont: Wadsworth, 1970).

A great deal of pseudoscience is founded upon imagination rather than solid evidence. As Maier notes, evidence sufficient to convince others may be lacking, but responsible health professionals will be cautious in applying imaginative ideas that lack solid evidence.

(2) <u>Theories to explain mechanisms of action</u>. The seductive nature of theories as explanations which will always "make sense" has already been discussed (see The Structure of a Scientific Health Profession.)

(3) <u>Data gathering</u>. Both scientists and pseudoscientists gather data which relates to their theories, methods and procedures. Such data-gathering is inevitably selective.

(4) <u>Need for confirming evidence</u>. Procedures must appear to work. No one will pursue a total failure for long. Both scientists and pseudoscientists will accumulate cases which appear to validate the procedure. On the other hand, no procedure can reasonably be expected to work 100% of the time, therefore, there will also be failures; these must be rationalized, but this is not a difficult task post hoc. Quacks and pseudoscientists will find that remissions, faulty diagnoses, placebo responses, and other clinical misperceptions will provide an ample number of patients who will enthusiastically declare that they have been greatly helped. Selective affirmation will supply all of the confirming evidence necessary to convince the unwary clinician that an uncontrolled procedure is working.

(5) <u>Commitment to health and humanity</u>. Great scientists are generally posed as dedicated to their work and committed to the health and well-being of humanity, and it probably is true. However, it would be wrong to believe pseudoscientists to be defective in commitment. Indeed, many pseudoscientists exhibit fanatical zeal.

(6) Egoism. It is not easy to establish the value of a new procedure. The drive that it takes to continue pursuing an idea in the face of incomplete evidence and critical peer review is a personality feature which demands a strong ego--hence the label egoism. It would be difficult to objectively differentiate between the personal egoism of a scientist versus a pseudoscientist. History makes such judgments post hoc, based upon the fruits of their labors. Those who produce truth are extolled; those who produce untruth are derided. ("Psychological factors in the scientific process: 1954," in Boring, Psychologist at Large, New York: Basic Books, 1961.)

Differences Between Science and Pseudoscience.

(1) Striving for refutation. No aspect of the scientific process is more discriminating

than the feature of striving for refutation. This is exactly the opposite of the pitfall of selective affirmation. Because experience has taught us that our natural perceptions easily can deceive even the best intended observers, scientists must make special efforts to <u>disconfirm</u> the validity of their ideas. Indeed, the science of statistical probabilities that is used to test hypotheses can, in fact, only be used to <u>reject</u> or <u>not</u> reject a <u>null hypothesis</u>; null means <u>zero</u> (i.e., "nothing"), and states that there is "nothing to the stated hypothesis."

(2) <u>Parsimony</u>. The scientific method is said to be <u>parsimonious</u> (i.e., "stingy"). This conservativism is a critical part of scientific constructionism. The position is that it is better to err on the side of conservatism as to whether or not something is to be accepted as truth. It is considered better to wrongly reject a truth than to wrongly accept an error. The belief is that truth will eventually come to the fore even if it may be delayed for a while, but to accept an error can distort, sidetrack or delay the discovery of truth in related fields.

(3) Acceptance of the burden of proof. Pseudoscientists are fond of expounding theories but refuse to test them. They commonly call upon others (e.g., the AMA, FDA, ADA, NIH) to test their notions. They may claim that the failure of "the establishment" to test their ideas is proof of a conspiracy to stop scientific It is both unrealistic and impractical to expect others to bear the advancements. burden of proof for the safety and effectiveness of a new procedure. Such is unrealistic in that others are busily engaged in pursuing their own projects and can ill afford the time, effort and cost of undertaking the work of another. Accepting the burden of proof for another is impractical because only the proponents possess the insight needed to properly carry out experiments. In rare instances the scientific establishment has made the mistake of accepting the burden of proof for another's claims. The National Cancer Institute tested the controversial cancer remedy Laetrile (New Engl J Med, 306:201-206, 1982). Predictably, when Laetrile failed, its advocates claimed that the wrong kind had been used, on the wrong patients, in the wrong way, by biased researchers, and so forth. It is only practical and realistic that proponents, who are the ones most able to properly apply the procedure, conduct the research and write up their protocol in clear step-by-step terms so that others can attempt to replicate their results.

(4) <u>Use of scientific methodology</u>. Scientists clearly define their terms, develop testable hypotheses; describe subject criteria; use adequate numbers of subjects; employ randomization; form controls; employ reliable, valid, objective methods of observation; employ statistical analysis; and, use appropriate inferences for results obtained. Scientists do not obscure their work. They publish their ideas, theories, methods and findings.

(5) <u>Acceptance of critical peer review</u>. Scientists seek the opinions of others who have expertise, knowledge and insight in the area that they are studying. It makes sense to open one's work to those who are potentially the most critical <u>before</u> the work becomes public. It is certain that these criticisms will eventually emerge, so it is best to invite scrutiny while it is still possible to correct faults that may be identified.

(6) <u>Acceptance of accountability</u>. Responsible scientists accept accountability. Quacks seek to avoid such by placing the responsibility on patients--usually under the guise of "freedom of choice."

(7) <u>Objectivity</u>. Pseudoscientists encourage a <u>will to believe</u> rather than objectivity; and, objectivity is probably the most widely known feature of science. However, objectivity is probably the most widely questioned characteristics of scientists. It is argued that

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a lack of personal bias is psychologically impossible--a primary reason for being part of a community of scientists who can help balance inherent biases. Despite an inability to achieve perfect objectivity as individuals one may improve upon objectivity.

Steps to Objectivity.

Just as there are steps to believing, there are steps which can help more individuals toward greater objectivity. Objectivity is the most important requirement of a scientist, however, few would dispute that it is a challenge for human being to achieve. Cultural biases, the Zeitgeist (a term meaning "spirit of the times in which we live"), personal background, and more, work against true objectivity. The need for community within science is based largely upon the inability of individuals to achieve full objectivity.

To get the full benefit of the exercise it is helpful for one to state a currently-held, disconfirmable belief (unprovable philosophical-religious beliefs held by faith cannot be used) in straight forward terms; example: "I believe that taking 1,000 mg of vitamin C daily will prevent colds."

<u>Step one. The willingness to admit that a current belief might be wrong</u>. This is the most essential step. The unwillingness to admit that some testable belief might be wrong is an indication that it would be a serious error to attempt scientific research or pretend to be objective about such a belief.

<u>Step two.</u> Develop the power of "alternative thinking." The ability to develop, consider and test alternative approaches to a problem is an essential part of the scientific process. Bias and delusion represent single-minded approaches. The power of alternative thinking requires imagination, creativity and innovation.

<u>Step three. Define what it would take to prove you wrong</u>. Composing a clear, operational statement of precisely what evidence would be required to convince you that a currently held idea is wrong is an excellent exercise for developing objectivity. Such is tantamount to developing a null hypothesis.

<u>Step four.</u> Seek disconfirmation. Pursue the test that would cast great doubt upon your belief.

<u>Step five. Do not reach hard and fast conclusions</u>. Recognize that conclusions are almost always based upon incomplete information. Conclusions may be stated in terms of what you know at this point. Do not force yourself into ego-traps which make a change in your position appear to be "a loss of face."

Conclusion

Just as there may be no such thing as a perfect dentist, judge, lawmaker, churchmember, husband or wife, there is probably no such thing as a perfect scientist. Perfect models only serve as goals to continually strive for and principles serve as guidelines along the way. Those who claim to provide scientifically-based health care should exhibit scientific attitudes and ethical conduct which is consistent with scientific principles. QUESTIONS

- 1. According to the author, the aspect of health care delivery most in need of protection by responsible providers is:
 - a. business (e.g., vulnerability to antitrust law).
 - b. clinical (e.g., freedom to innovate).
 - c. scientific (e.g., requirements to prove safety and effectiveness).
 - d. none of these (all are equally important).
- 2. Evidence of the low priority given the scientific aspects of health care is demonstrated by:

a. the licensure of nonscientific providers in all jurisdictions.

b. a lack of requirement by the U.S. Department of Education that accrediting agencies for health provider training institutions commit themselves to standards of science.

- c. a 1986 antitrust ruling against organized medicine.
- d. a and b
- 3. In functional terms, "science" is defined as:
 - a. a way of arriving at and advancing beliefs.
 - b. logical thinking.
 - c. a body of knowledge.
 - d. technology.
- 4. The healthy skepticism of science is rooted in the ancient philosopher:
 - a. Pythagoras
 - b. Pyrrho
 - c. Hippocrates
 - d. Huxley
- 5. Which of these basic are the rivals of science better at dealing with than science?
 - a. What?
 - b. When?
 - c. Why?
 - d. How?
 - e. None of these
- 6. An unnatural use of our perceptions demanded by the scientific process is: a. seeking disconfirmation.
 - b. selective affirmation.
 - c. post hoc ergo propter hoc.
 - d. social expectation effect.
- 7. The most significant feature of the process of adopting a belief is:
 - a. accepting faulty validation
 - b. accepting its plausibility
 - c. personal experimentation
 - d. faulty self-validation
- 8. The most important step toward objectivity is:
 - a. admitting that a current belief might be wrong.
 - b. define what it would take to prove you wrong.
 - c. develop alternative propositions.
 - d. seek disconfirmation

- 9. Which of these is true of placebos?
 - a. patients must believe in the treatment for a placebo effect to occur.
 - b. placebos are harmless.

c. when a placebo effect occurs, it is proof that the patient's condition is imaginary.

d. none of these.

10. Collecting the positive findings that reinforce what we expect to happen while inadvertently overlooking or rationalizing away negative outcomes is: a. seeking disconfirmation.

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- b. post hoc ergo propter hoc.
- c. selective affirmation
- d. Hawthorne effect

Answers:

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4. b

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6. a

7. b

7. 5

8. a

9. d 10. c

PART TWO

DUBIOUS DENTAL PRACTICES

Dental Faith Healing Is there harm? Crystal Healing Pyramid Power The "Sacred" or "Occult" Geometry The Mummy Case Holistic Health Antiscientism (Reductionism) Refuting antiscientific holism Vitalism Monism Herbal magic Alchemy Doctrine of Signatures Expressions of Vitalism [Life Force Spiritual Discipline] Acupuncture EAV "Acupuncture" ["Energy Medicine"] Homeopathy Origin, Law of Similia / Provings Law of Infinitesimals / Potentizing Homeopathic Vitalism The folly of sectarianism [Doing the Right Thing, For the Wrong Reason] Allopathy Significance of a Misnomer Chiropractic "Chiropractic" versus "Chiropractors" Spinal Manipulative Therapy "Chiropractic" Scientific Status: Validity " " : Reliability ... 11 The Legal Dilemma "Chiropractors" The myth of druglessness Inroads Into Dentistry Applied Kinesiology Posture & TMJ Dysfunction Craniopathy Evaluating individual chiropractors Naturopathy Body wisdom Appeal

Questions

Dubious Dental Practices

Dubious dental practices cover a broad range. Some interesting examples are presented below. A question worth pondering as you review the following cases is "how far should a practitioner go to achieve clinical ends once they exceed the rigor and parsimony of the scientific process?"

Dental Faith Healing.

According to Willard Fuller, a former Baptist minister, at least 40,000 people are walking around with "miracles in their mouths" following his touch on their heads and prayers. Fuller has been active in his dental healing ministry at least since 1960 when he was "filled with the Holy Spirit" (Omni, November, 1986). Fuller has appeared all over the United States, in Australia and Canada conducting dental faith healing sessions. According to a Consumer Alert issued by the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), Fuller's claims were tested in 1971 by the Lewiston-Clarkson County (Idaho) Dental Society's representative Russell Radke, DMD. Dr. Radke charted and photographed the mouths of 28 people who sought healing.

At that session, Fuller claimed about ten healings, including silver and gold fillings appearing where there had been none and eight cases in which silver fillings had turned into gold. Of the eight cases Dr. Radke reported: "I found only what appeared to be old oxidized silver fillings with no gold sheen present as Fuller stated." On examining photographs, Dr. Radke found that on of the "new" silver fillings had actually been there before the service. "When I informed the woman of my finding," he wrote, "she readily admitted that she had forgotten that the filling was there." A "gold filling" miraculously bestowed turned out to be a tobacco stain.

In 1986, charges brought by the state Dental Board of New South Wales, Australia, resulted in Fuller being fined \$435 for falsely advertising himself as a dentist capable of filling cavities and straightening teeth.

Is there harm? Since dental diseases are only rarely fatal, some people may not consider Rev. Fuller a serious threat to health. However, the CSICOP alert included the warning that Fuller's practice of dipping his dental mirror in a cold solution was insufficient sterilization, and that Fuller was observed not to have washed his hands between patients. Further, permitting well-publicized, alleged paranormal healing to go unchallenged by experts serves to reinforce the unfounded belief that faith healing is an effective alternative to regular health care. People who hold such beliefs may be psychologically predisposed to future disaster if some life-threatening condition strikes them or others, such as their children, who are dependent upon their judgment.

Crystal healing.

A dental patient appeared at the Loma Linda University dental clinic wearing an amulet that a dentist had sold her to cure her gum disease. The amulet contained a quartz crystal that supposedly vibrated at the correct frequency for healthy gums. Along with the amulet, the patient had been sold a dietary supplement called "The Total Food" and given instructions to follow "The Divine Diet." The diet directed, among other things, that the patient eat "high energy foods," but pointed out that the "energy" referred to was "not calorie energy." Presumably, reference is to some sort of cosmic energy.

Interestingly, this same dentist attempted to sell a similar amulet to one of the author's

dental hygiene students. The young woman had received a spinal cord injury and become partially paralyzed at the waist. According to her report, he came down on his original price several times--and eventually offered it to her free if she'd give it a try. Despite urging from her mother that she try it, the well-adjusted girl rejected the offer as false hope.

The notion that quartz crystals vibrate and heal was popularized by actress Shirley MacLaine who appeared on the cover of <u>Time</u> magazine in connection with her advocacy of such notions. Ms. Maclaine appears to be a better actress than health physicist. According to George Lawrence, PhD, a research scientist at the University of Colorado, quartz crystals have some remarkable qualities. Expansion with temperature is very small (they will not break when red heated and thrown into cold water) and they are electrically active. Neither of these qualities is mysterious to physicists. Quartz crystals vibrate at frequencies from a few thousand to 100 million cycles per second depending upon the size and shape to which they are precision cut. Dr. Lawrence says:

The new age thinker attaches magic and emotion to crystals partly because he is vaguely aware of the near-perfect technical properties of quartz crystals. No matter if the technical facts are wrong ("Quartz crystals amplify the sound"), the claim is made that science supports the mystical claims. In fact, quartz crystals did not vibrate and resonate until twentieth century science found the way to make them. Left to themselves, they still do not vibrate; they simply sit there. (Lawrence. "Science and myth of crystals," <u>The Rocky Mountain Skeptic</u>, Nov-Dec, 1987).

Of course, there is no evidence that vibrating quartz crystals will heal gum disease or any other health problem. Claims by self-proclaimed gem therapists that "crystal energy can clear away negative attitudes," "enhance communication," "open the heart to love and courage," " simplify decision-making," "balance the spirit," "focus the mind," and "tap into psychic power," belong in the realm of the pseudopsychologies.

Pyramid Power.

Headlines of a dental society journal article read: "Energy Force From Early Civilization May Find Application in Modern Dental Techniques." The article's reference was to dental implants performed under pyramid-shaped grids alleged to focus mysterious forces that will benefit patients. It says that, "observations have been encouraging...pyramidal energy seems to repel bacteria," and that "improvement in healing following implant surgery" has been observed, but that "it would be premature to assume a correlation." [Note: It is paradoxical that pyramid power is alleged to have a negative affect upon microscopic plants (ie, bacteria) but supposedly enhance the growth of house and garden plants. It appears that pyramids always have affects that people judge to be positive.]

The ancient Egyptian pyramids have long been a source of popular interest. Stories which make of mystery about the pyramids beginnings appear to conform to the principle stated by Kuche (<u>The Bermuda Triangle Mystery--Solved</u>, New York: Warner Books, 1975). in his debunking of the Bermuda Triangle to wit: "The less someone knows about something the easier it is to make a mystery out of it." In fact, Egyptologists know much about the pyramids and how they were built, and while their construction was a monumental physical feat, neither their mathematics, shape, precision (the Bent Pyramid is pretty sloppy) or anything else about them is mysterious.

The theory alleges that the pyramid's shape--particularly at the level of the "king's

chamber" which is at located one-third of the height directly under the apex--focuses some kind of cosmic energy. The author has conducted numerous tests of pyramid power to affect flavors and preserve foodstuffs (one was broadcast on the television health show "Medix"). None have yielded support for pyramid power in spite of claims by proponents that it can affect these favorably.

The "Sacred" or "Occult" geometry.

Diverse theories from folklore, witchcraft, magic and fringe physics can be associated with the notion that pyramidal shapes, crystals, triangles and similar objects possess special powers. A concept called the "sacred" or "occult" geometry provides an explanation. The origins of the concept are obscure, but the theory is easily grasped. It is theorized that there exists a counterforce to gravity (outward vs. inward), and that this force behaves a certain way and may be affected by various means. The force allegedly follows "ley lines." It is claimed that these mysterious lines can affect mood and health. People suffering from chronic conditions are encouraged to hire dowsers to check the location of their houses and beds to ascertain whether or not they are located on an intersection of ley lines. If so, copper plates are to be placed under the building or bed for protection.

Crystals are alleged to form along ley lines. Cooling materials form triads as they shrink forming polygonal shapes with pyramidal points. The idea is that the ancient Egyptian pyramids mimic this natural feature. The Bermuda Triangle is also connected to the sacred geometry (for a rational discussion of the Bermuda Triangle which will provide evidence that nothing mysterious actually happens there see: Kusche LD. <u>The Bermuda Triangle Mystery--Solved</u>, New York: Warner Books, 1975). Even the traditional cone-shape of wizards' hats has been connected to the occult geometry (recall that dunce-hats also are traditionally cone-shaped!).

Pendulums and dowsing rods supposedly are sensitive to this force. Water witches often use it as an explanation for their craft. Despite the widespread common "successful" experiences which many have had with water witching, dowsers have not been able to perform better than chance under controlled conditions (Smith D, "Two tests of divining in Australia," <u>The Skeptical Inquirer</u>, 6:4:34-37, 1982; Martin M, "A controlled dowsing experiment," <u>The Skeptical Inquirer</u>, 8:2:138-140, 1983-84; Randi J. "The great \$10,000 dowsing challenge," <u>The Skeptical Inquirer</u>, 8:4:329-333, 1984). (For more on dowsing see: Hyman and Vogt. <u>Water Witching USA</u>, Chicago: University of Chicago Press, 1959).

Dowsing and pyramid power sometimes are called <u>radiesthesia</u> meaning "the sensitive radiance." Radiesthesia is linked to the alleged human "aura" which self-proclaimed "psychics" claim to see and be able to "read" for physical and psychological analysis. Kirlian photography is alleged to provide photographic evidence of the mysterious force, and faith healers frequently claim that Kirlian photographs verify their mystical powers. However, scientists report that Kirlian photography is merely coronal discharge photography which is easily explained in terms of its physics (Pehek, et al. "Image modulation in corona discharge photography, <u>Science</u>, 194:263-270, 1976; Watkins and Bickel, "A study of the Kirlian effect," <u>The Skeptical Inquirer</u>, 10:244-257, 1986).

Enthusiasts also claim that talismans, scepters, magic wands and amulets may affect the force, which explains there use in ancient times. Further, the alleged force may affect radio transmission, the northern lights, bird migrations, planetary movements (a possible connection to astrology), ocean currents, earthquake faults, weather patterns, and more. The concept takes on a quasi-religious tone when it is claim that angels may travel by this force and that the force may create heavenly bodies.
Devotees wish for someone to present a unified theory that will alter the scientific worldview just as Einstein's theory of relativity displaced Newtonian physics. Some "new age" enthusiasts believe that such a revision would establish the "Age of Aquarius." A Stanford University physicist has been suggested as a leading candidate for the role of such a revisionist.

The Mummy Case.

The extent to which health care providers and their followers may go once they have abandoned science was seen in the notorious "mummy case." In February. 1988, it was reported that a suburban Chicago man's body had been kept unburied for nearly nine years by a holistic health cult involving several area dentists.

To summarize the story: Attorney, Roger Stevens, who was described by his partner as "a brilliant lawyer, avid dieter and health advocate," became enamored with holistic health as taught by a group of holistic dentists. In 1979, Roger convinced his 40year-old Type I diabetic brother, Carl, that he could become free of his need for insulin by substituting vitamins. Carl's Registered Nurse wife, Carole, was also convinced that vitamins could replace Carl's insulin. Carl gave the theory a try and died in about two weeks time. However, the group refused to accept the reality of Carl's demise, treating him instead as if he was merely ill. Carl's body was bathed, clothed, mobilized (passive exercise) regularly. Carole quit her job at the local hospital to "care for Carl" at home. Carl's employer reported his absence from work leading to a police investigation, but attorney Roger used his legal skills to keep the police at bay.

Several years passed. Roger died in 1985 at age 43 in a Chicago hospital weighing 89 lbs. A nurse who cared for him stated, "I think it was his diet that killed him" (the diet is said to have consisted exclusively of cabbage and garlic). After that, one of the dentists moved into the Stevens home and acted as spiritual and dietary counselor. The group, which included two teenaged children, used "Applied Kinesiology" to test their food. It is also reported that they "communicated" with Carl by "channeling his spirit." The bizarre episode came to a head when a relative managed to get into the house and view Carl's corpse. (Smith W. <u>York Daily Record</u>, p.14A, February 14, 1988; <u>Oprah Winfrey Show</u>, March 10, 1988; Individual interviews by the author).

Authorities arrested Carole and dentist Richard Kunce charging them with failing to promptly report a death, forgery for falsifying a power of attorney document, and for forging Carl's signature on disability checks. Carole Stevens was also charged with child neglect. Kunce had let his dental license expire so dental authorities had no jurisdiction over him. Of greater interest to dental professionals, the holistic health cult involved has been traced to at least 13 states and several foreign locations. It apparently began following a continuing education seminar presented by holistic dental mavericks.

Holistic Health

The concept of <u>holistic health</u> has become popularly associated with nonscientific health care. This is paradoxical because the term originally meant that to neglect the social and behavioral sciences in patient care was to <u>not be scientific enough</u>! The term "holistic" has become so badly abused that it is necessary for to have it defined within its context before its validity can be assessed.

Critics charge that holistic health is not a distinct concept of medicine as it is made to appear, but a hodgepodge representing four different approaches to medicine and health masked by a common creed (Vanderpool HY, "The holistic hodgepodge: a critical analysis of holistic medicine and health in America today," <u>The J of Family</u>

<u>Practice</u>, 19:773-781, 1984). The creed contends that holistic medicine represents a more complete understanding of the causes of disease and the factors that sustain health than is held by most scientific practitioners. Proponents advance the Greek term <u>holos</u> which is reflected in definition of <u>holism</u>: "a theory that the determining factors in living nature are irreducible wholes" (<u>Webster's 7th New Collegiate Dictionary</u>).

Vanderpool points out that a scientific holistic health concept evolved as new disciplines such as nutrition, genetics, psychosomatic and environmental medicine emerged. In the 1940's, 1950's and 1960's a number of comprehensive care programs were set up. This biopsychosocial model seeks to integrate what is learned by the medical specialties. This is reflected in the definition of holistic: "emphasizing the organic or functional relation between parts and wholes" (Webster's 7th New Collegiate Dictionary). Like the biopsychosocial concept, whole-person medical care integrates the behavioral sciences. It emphasizes the patient's role in terms of their inner feelings, perceptions, and beliefs; and the humanistic dimension of patient care.

Health promotion also represents a scientific approach to holistic health. This long established dimension of public health represents the highest level of preventive medicine which emphasizes better nutrition, physical fitness and mental health for their own sake to improve overall health status and the quality of life. Vanderpool describes this as <u>high-level wellness</u>.

Lastly, Vanderpool describes <u>unconventional and esoteric diagnosis and healing</u> as the philosophy and practices which oppose Western medical science. Included are methods derived from ancient cosmologies, such as Chinese Medicine, and unconventional therapies and approaches to diagnosis which "have generated little research and seem patently outlandish." Herbert describes this brand of holistic health: "a melange of banalities, truisms, exaggerations, and falsehoods, overlaid with disparagement of not only scientific conclusions but of logical reason itself" (Herbert V. on back cover of Stalker and Glymour. Examining Holistic Medicine, Buffalo: Prometheus Press, 1985.) It is this last category of holistic health that we wish to focus criticism upon as inappropriate and irresponsible health care.

Antiscientism. The proponents of holistic health are not simply nonscientific empirics, but antiscience in their beliefs and attitudes. Antiscientific holism finds it basis in several propositions:

(1) That science is <u>reductionist</u>. Proponents argue that because they treat the whole person, body and spirit, and that the methods of "reductionist" science are inadequate for testing their methods.

(2) That science is <u>materialistic</u>. The materialism of which they speak does not refer to yuppie greediness, but antagonistic to ethereal; ("unworldly, spiritual" = ," <u>Webster's</u> <u>New Collegiate Dictionary</u>).

(3) That science is <u>mechanistic</u>. Explains all functions, including biological, in terms of matter obeying basic physical laws.

(4) Science is often assailed as <u>culturally biased</u>, dominated by Western philosophical thought. Holistic devotees prefer mystical Eastern worldviews. (5) Scientific medicine is said to be <u>elitist</u>. They charge that the scientific establishment is only socially superior, and this is the result of privilege rather than by merit.

Refuting antiscientific holistic health. One does not have to be antiscientific to criticize

science or modern health care's fragmentation by specialization. Specialization in the health sciences has lead to more skilled but often dehumanized and more costly Specialization is largely the product of the necessity of subdividing the patient care. enormous complexities of life. Sarton noted that science owes its "immense fertility to its deliberate and severe restraint" (Sarton. A History of Science, New York: W.W. Norton, 1952). It is by limiting the scopes of investigations that scientists are able to slowly unravel nature's grand design.

Figure 4 portrays how scientific reductionism occurs. Philosophical concepts can be expressed in psychological terms. For instance, the philosophical concept of Fatalism can be stated and measured as locus of control; psychology in terms of brainfunctioning or psychobiology; biochemistry bridges the basic sciences of biology and chemistry; chemistry merges with physics on the elemental level; and, quantum physicists say that by measuring electrons they are altered and, thus, unmeasurable returning us to the uncertainties of philosophy.

Figure 4.

REDUCTIONISM

to

to **Physics**

Philosophy to Psychology to Biology Chemistry

From: Taylor. The Natural History of the Mind, New York: EP Dutton, 1979

Although some criticism of modern health care are justified, the antiscientism of holistic health is not for the following reasons:

Health care need not be reductionist. Although science has to be reductionist, health care need not be so limited in its delivery. Clinical goals will always dominate in patient care, and applications of art and empiricism are appropriate. However, this does not justify the antiscience dimensions of holistic health. Modern health care doesn't need less science, it needs more art--the compassion and caring that humanizes health care.

Spiritual healing is beyond the scope of science. Treating the "spirit" is not possible until such an entity can be identified and the benefits and harms of various approaches assessed. Attempts to measure the spirit have been fruitless up to now (Christopher M. Mediums, Mystics and the Occult, New york: Thomas Y. Crowell Company, 1975). "Spiritual" treatment is the proper function of religious persons who share the faith of believers. Responsible spiritual healers will not deter people from proper health care.

Science views people more holistically than most ancient models. The scientific view of the nature of man is unitary. In this view, mind is body (brain functioning). Philosophers regard models that present the nature of man as body-mind dichotomies as dualistic. Much of holistic health is dualistic, and is simply mind-centered rather

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than body-centered. Many so-called "holistic" systems actually focus on a narrow aspect of human anatomy or physiology. Chiropractors are obsessed with the spine, iridologists with the irises, reflexologists with either the hands or feet, acupuncturists with alleged points on the skin, Ayurvedic practitioners with the pulse, and so forth.

<u>Science is universal</u>. Science is neither Western nor Eastern in methodology or thought. Natural laws do not differentiate between east and west. Neither does sound scientific methodology differ on the basis of East versus West. To deny the contribution Easterners have made to the development of science and the modern medical armamentarium is also a form of cultural bias. Science is distinguished by the fact that it advances on a provable basis. Health claims are clearly within the realm of scientific measurement--a fact firmly established in consumer protection law.

<u>All treatment procedures are testable</u>. In order to render treatment one must descend from the philosophical stratosphere and <u>do</u> something. Whatever is done, whether it involves placing an acupuncture needle, delivering a chiropractic adjustment, or giving an herbal potion, can be tested for its safety and effectiveness. No treatment method is beyond a scientific evaluation clinically. Clinical outcomes of any procedure can be compared to (1) the natural course diseases can be expected to follow without treatment; (2) placebo therapy; (3) other standard therapies currently in use; in terms of their safety and effectiveness.

[Recommended reading: Stalker and Glymour. <u>Examining Holistic Medicine</u>, Buffalo: Prometheus Press, 1985.]

<u>Vitalism</u>.

It is impossible to suppress the vitalist point of view; it dodges every blow and reappears under some new form. (Sarton G. <u>A History of</u> <u>Science</u>. New York: WW Norton Co. p.497, 1952)

Proponents of antiscientific holistic health care actually revive a very old debate within medicine--that of <u>Vitalism</u>. Scientific health professionals need to understand the significance of this historical debate to fully grasp the turmoil represented by dubious dentistry.

Vitalism is defined as: "a doctrine that the functions of a living organism are due to a vital principle distinct from physicochemical forces" (<u>Webster's 7th New Collegiate</u> <u>Dictionary</u>). Such a doctrine opposes modern science's mechanistic approach to physiology and views life as metaphysical and mystical. Vitalistic views of physiology were widely held until 1828 when Wohler manufactured urea without a dog or bladder. He proved that organic compounds could be synthesized in the laboratory--the beginning of organic chemistry.

Apparently, some people cling to metaphysical viewpoints out of a loyalty to their religious faiths believing that a Vitalistic worldview is required to maintain a belief in God. However, a mechanistic view of life processes does not have to deny the existence of God but can present Him as The Master Designer.

Monism. Vitalism is rooted in monism: "The view that reality is one unitary organic whole with no independent parts" (Webster's 7th New Collegiate Dictionary). Monism is the basis for practically all ancient cosmologies. Fundamental to monism are the concepts that "like is like," "like makes like" and "like cures like." Monism pervaded the ancient world and provides the basis for primitive belief systems. The marks of monism can still be seen in many ways.

Monism provides the basis for ancient idolatry. A carved idol is believed to actually become a god once it takes on its <u>likeness</u>. The Biblical third commandment made it a sin to create idols by making such likenesses. Ancient astrologers named the red planet Mars after the god of war because war sheds blood which is red. <u>Animism</u>, a belief in ethereal spirits, which is found in all primitive cosmologies is also rooted in monism:

The first assumption of most animists is that reality is all of one piece. That is to say, there is not the same water-tight distinction between human beings and animals, or between animate and inanimate existence. Animals may be ancestors of men, people may change into animals, trees and stones may possess souls, and the mana of a stick may be transferred to man. In fact, in some groups, almost every object is the universe is viewed as possessing some amount of life force--the spiritual, nonmaterial substance without which nothing could exist and that in reality is its true character and secret of its power. This life force, or soulstuff, exists in greater concentrations in famous men, strong charms, revered fetishes, and powerful gods. In essence, the force is the same everywhere, it is only distributed in different quantities. (Nida E and Smalley WA. Introducing Animism, New York: Friendship Press, 1959).

The roots of the notion that what a person eats can affect "what he is" can be traced to monistic animism, and practices such as eating the heart of a tiger for courage, goat genitals or rhino horn (a phallic symbol) for virility.

Herbal Magic. The ancients made no distinction between foods and drugs. Any substance ingested by mouth was considered to be food. All food was thought to contain varying amounts of a single vitalistic (Life force) substance. Some "foods" were thought to be magical. Included were foods that produced dramatic cures --such as vitamin C containing foods serendipitously ingested by people with scurvy--and those containing mind-altering drugs such as opium, marijuana, cocaine, peyote, ergot, and alcoholic beverages. To someone with a monistic cosmology the hallucinations, stimulation and depression was viewed as a spiritual experience, and alcoholic beverages are still sometimes referred to as "spirits."

Interestingly, the witches' caldron contained psychotrophic herbs which when applied created the sensation of flying leading to the halloween characterization of the witch flying on her broom (Tyler V. "Solanaceous narcotics--a brief history," <u>Pacific Information Service on Street Drugs</u>, 4:3-6, 1974). Further, some of the herbs used by sorcerers induced the sensation that hair was growing out of the body and caused the imbiber to act as an animal leading to the myths about wolfmen (De Givry G. <u>Witchcraft, Magic & Alchemy</u>, New York: Bonanza Books, undated). Many practices of witchcraft are based upon the fundamental principle of monism. Voodoo dolls are made to resemble an enemy and pins are stuck in strategic places in the hope that afflictions will be created in those parts of the physical body. Someone wanting to curse an enemy with blindness may stick pins in the doll's eyes, or in the chest if they wish to produce a heart attack, and so forth. Here again the likeness is believed to possess the life force of the prototype.

Many of the practices of primitive medicine centered around monism with its unity of all nature belief. The <u>Ebers Papyrus</u>, an ancient Egyptian pharmacopeia, lists remedies for various ailments. Many of the ancient Egyptian remedies were apparently based upon the belief that characteristics of the source of the medicine would be transferred to the sick. Treat <u>like with like</u> was the principle they employed. Ancient Greek medical practice was also based upon monism.

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Alchemy. One of the grandest examples of employing monism's unity of all nature belief can be seen in the history of alchemy. Although most people associate alchemy with attempts to transmute base metals into gold, in reality, alchemy had its beginnings in the search for the <u>Elixir Vitae</u>--the substance of life.

According to an herbal cult of immortality in China, about 200 B.C., certain plants could make man immortal. Greek alchemy, the earliest record of which dated about 200 A.D., presents a similar version, was originally Chinese and was introduced by the Arabs who brought herbal drugs of longevity to Alexandria. The name of these drugs, <u>Chin-I</u>, dialectical <u>Kim-Iya</u>, was Arabicized as <u>Kimiya</u> and transliterated <u>Chemeia</u> by the Copts. Other terms were later influenced by Indians Chumeia, 100 A.D.) and more directly by the Chinese (Chrusozomion, 200 A.D.).

The three terms signify herbal elixirs of gold and the art related to them. Both early Chinese and Greek alchemies were not concerned with the making of bullion gold. In China the development of alchemy has been ruled by two theories: first, as like makes like, a perennial plant can make human life perennial; likewise, certain substances can prolong human life as the are rich in Life-force or Soul-content. From here, Blood was equated to Soul and later Redness to Soul. Jade, cinnabar and eventually gold, more precisely Red-gold or Cinnabar-gold, a colloidal gold, became the ideal drug of immortality." (Mahdihassan S, "A comparative study of Greek and Chinese alchemy," <u>Amer J. Chinese</u> <u>Medicine,</u> 7:171-181, 1979).

Paracelsus, a 16th century alchemist, attempted to reform his guild by chiding them for seeking riches by transmuting gold when they should be seeking to improve man's lot by finding cures for diseases.

Doctrine of Signatures. Paracelsus enunciated <u>The Doctrine of Signatures</u> which stated that God would not permit any disease to come on the earth without providing a cure for it, and further, that He would not leave mankind without a clue as to what the cure was. His clue would be that it would resemble the organ it would aid. Eyebright is good for the eyes because of bloodshot eye-like markings on it, liverwort was good for the liver because its leaves were shaped like the liver. Ginseng is regarded as good for all parts of the body because the root can be imaged to resemble little people with head and appendages. Seeds have the ability to germinate and are, therefore, seen to have more Life Force than other plant parts. This is why seeds, wheat germ and similar substances (including the apricot pits used in preparing the discredited cancer drug laetrile) are revered by herbalists. Actually, Paracelsus was simply employing the basic unity of all nature principle of monism in his Doctrine of Signatures.

Expression of Vitalism. Vitalism is expressed culturally, religiously, metaphysically, pseudoscientifically, and even as a possible basis for extrasensory perception (ESP). Evidence for the fact that Vitalism is not limited to being a religious or cultural concept is that even the atheistic Russian Communists (see Figure 5), who hold a persistent interest in ESP, describe vitalism as a "bioplasmic" force.

Figure 5.

Expressions of Vitalism

<u>Title</u> Oriain Prana Hinduism Ch'i (Ki, Qi) Taoism and ancient Chinese medicine Mana Polynesian Orenda American Indian Animal Magnetism Franz Anton Mesmer Daniel David Palmer (founder chiropractic) The Innate Orgone energy Wilhelm Reich Vital energy Samuel Hahnemann (founder homeopathy) Baron Karl von Reichenback Odic Force Bioplasma Contemporary Soviet parapsychologists The Force George Lucas (Star Wars)

From: Reisser PC, Reisser TK, Weldon J, <u>The Holistic Healers: A Christian</u> <u>Perspective on New-Age Health Care</u>, Downers Grove, IL: InterVaristy Press, 1983.

A comparison of Figure 5 with the list of disciplines (Figure 6) provided in the <u>Discipline Directory for Holistic Practitioners</u> published by the Holistic Dental Association (undated) reveals that Vitalism specified under the heading of "Life Force Spiritual Discipline" and is central to many of the dubious practices finding their way into "holistic" dentistry.

Figure 6.

Disciplines Constituting Holistic Dentistry

Acupuncture discipline Allopathic discipline Chiropractic discipline Endodontics discipline Exercise discipline General dentistry discipline Homeopathy discipline Kinesiology (muscle testing) discipline Legal & insurance discipline Life Force (spiritual) discipline Myofunctional therapy discipline Nutrition discipline Oral surgery discipline Orthodontics discipline Osteopathy (cranial) discipline Periodontics discipline Physical therapy discipline Prosthodontics discipline Psychology discipline

Discipline Directory for Holistic Practitioners, Carlsbad, CA: Holistic Dental Association, (undated).

Life Force (Spiritual) Discipline.

[Life-Force is the Bio-Energy which holds everything together and which allows life to flow in a natural and balanced way. This Life-Force exists on whatever level of consciousness we operate, and is the basis of all human understanding and action. By keeping this force in balance, the patient is in tune with the natural laws, which helps him avoid energy drains which cause illness.] (Discipline Directory for Holistic Practitioners)

Despite its circular use of terms (bio=life; energy=force), the above is a clear statement of metaphysical Vitalism. Practicing in this dimension exceeds the legal scope of dentistry as well as the rational scope of science.

The directory lists nineteen "disciplines." Some of these are standard dental areas, while some others are scientifically-based disciplines outside of the scope of dental practice, but even with these, some unproven holistic methods are employed. Focus will be upon the nonscientific theories and practices incorporated by holistic dentists listed in the <u>Discipline Directory for Holistic Practitioners</u> published by the Holistic Dental Association.

Acupuncture.

[Acupuncture is the study of electrically significant points on the body, the relation to organs and tissue systems, and their use in the treatment of disease. A technique called Electra (sic) Acupuncture according to Vole (or E.A.V.) gives the doctor a total view of how each organ, joint, endocrine system, tooth, etc. is functioning. Through the use of acupuncture, any practitioner can gain a complete diagnosis of any organ system affecting his treatment, and adjust his treatment to the patient's best advantage.] (Discipline Directory for Holistic Practitioners)

According to ancient Chinese Medicine theory, acupuncture points are located on alleged meridians of energy flow. Anyone desiring to approach health care scientifically should be disturbed by the fact that, although scientists have found that acupuncture produces some benefit in pain control, its theoretical basis of Chinese cosmology is groundless. Dr. Felix Mann, a proponent of acupuncture, states that "Acupuncture points and meridians do not exist...There are so many acupuncture points mentioned in some modern books that there is no skin left which is not an acupuncture point." (Botek S.T., "One doctor's acupuncture odyssey," Medical Tribune, May 2, 1984, p.27).

[For an excellent review of acupuncture research see: Richardson and Vincent, "Acupuncture for the Treatment of Pain: a Review of Evaluative Research," Pain, 24:15-40, 1986.]

EAV "Acupuncture." What is described in the <u>Directory</u> is not acupuncture. EAV involves neither "acu" nor "puncture"! EAV is a form of "Energy Medicine" (see side box) that uses a galvanic skin response (GSR) device. A popular device is the Dermatron, but there are others (eg, Acuscope and Interro). These devices are not approved for diagnostic or treatment purposes. If sold for such, they would be declared "misbranded" under the 1976 Medical Device Act. However, Federal law only prohibits its sale in interstate commerce. Because health care delivery is regulated by the states, FDA does not have authority to prosecute anyone who employs a misbranded device in his or her practice. That is up to the state Board of Dental Examiners. It should be added that having used an unapproved medical device could have a negative impact in a malpractice lawsuit.

The Dermatron is used to assess the "electrical activity" at alleged acupuncture points on the skin. In use, the operator probes the alleged acupuncture on the patient's hand. The gauge has a finite range of zero to one hundred. A reading of 50 supposedly represents normal. High readings are theorized to indicate "irritations" and eventually "inflammation." Low readings are theorized to indicate "degeneration" worsening by degree. There are other features such as sudden drops in readings that are alleged to be significant to practitioners. Proponents claim to be able to both diagnose and prescribe utilizing the Dermatron. Various dubious preparations are prescribed on the basis of the readings.

Despite anecdotal reports and theoretical papers which have been published by proponents, EAV remains unproven and of doubtful validity. Critics of the Dermatron note that variations in pressure applied to the points can greatly affect readings. Skin moisture is also known to greatly affect galvanic readings. Galvanic devices also are capable of creating their own readings. Nansel and Jansen report that a GSR unit was "able within about 5 seconds to decrease the resistance of any particular point not already in its lowest state of resistance to a level sufficient to generate a positive and resistant GSR reading where none had been detected previously" (J Manipul & Physiol Thera, 11:267-272, 1988). The prescription of homeopathic remedies by EAV practitioners further undermines its credibility.

"Energy Medicine"

"Energy Medicine" traces its modern history to Albert Abrams, MD, founder of "Radionics." Abrams, a boy genius who obtained his medical degree at the University of Heidelberg at age 18--youngest graduate in 100 years--was a respectable medical Believing himself destined for greatness, Abrams never educator for years. accomplished anything outstanding. In 1916 he published a book titled New Concepts of Diagnosis and Treatment in which he presented his notion of Radionics. Abrams declared that all matter is in a state of vibration and everything has its own wave length or frequency-just as a radio station has--and that these can be tuned into for diagnosis and treatment. A specimen (urine, hair, skin, nail trimmings, blood, secretions, fecal matter) is required to accomplish this. Abrams called his system Electronic Reactions of Abrams (E.R.A.). He dubbed his device the "Oscilloclast," and reportedly made millions of dollars. In 1923 and 1924, the American Medical Association and the Scientific American spent more than \$30,000 investigating Abrams' devices over a ten-month period. Abrams claimed that he could determine all sorts of information about a patient with his device, including their religion--the patient had to be naked and facing west with their arms extended. (Kaplan, "Doctor Abrams-dean of machine quacks," Today's Health, 4/66). Abrams marketed his devices through the Electronic Medical Foundation (EMF) and made an estimated \$2-5 million. Abrams left his fortune to the EMF which continued to sell device long after his death. EMF eventually led out in the formation of the National Health Federation (NHF).

In the early 1950's, an organization called the Electronic Medical Foundation ran a lucrative diagnosis-by-mail service and also sold electronic treatment devices...An estimated 3000 practitioners, mainly chiropractors, would send dried blood specimens from their patients...a man who had lost his right leg elicited a diagnosis of arthritis in the right foot and ankle. The blood of a dead man brought back a diagnosis of colitis, and that of a rooster resulted in a report of sinus infection and bad teeth....In 1954, a U.S. District Court ordered the president of the firm, Fred J. Hart, to stop distributing the treatment devices. Shortly thereafter, Hart founded the National Health Federation. ("Fluoridation: the cancer scare," <u>Consumer Reports</u>, July, 1978, p.394)

NHF still aggressively lobbies against consumer protection laws, promotes dubious medical remedies, and is a major anti-fluoridation organization.

Homeopathy.

[Homeopathy is based on the principle of treating similar with similar, using highly diluted preparations. It is similar to the use of vaccinations or allergy desensitization programs, which use much more concentrated dilutions of similars. Thus, Homeopathy can be used as a preventive method for maintaining a high level of health, by eliminating parasites and other insidious causes of poor health.] (Discipline Directory for Holistic Practitioners)

Origin, the Law of Similia, and Provings. Homeopathy is the brain-child of Samuel Hahnemann, MD, who invented it around 1810. Dissatisfied with the "heroic medicine" of his time in which physicians bled, purged, blistered and puked their patients, Hahnemann searched for new medical theory. He apparently rediscovered the monistic concept of the ancients that "like cures like." He reasoned that medications could be matched with the illnesses they would benefit by giving drugs to healthy individuals and observing their physical and emotional symptoms. Quinine produced symptoms similar to malaria which it was also known to alleviate. He dubbed this his "Law of Similia." He "tested" other substances to determine what symptoms they would induce -- a system he called "Provings."

Law of Infinitesimals. To off-set the obvious absurdity that giving a substance that produces specific symptoms in healthy people is the same medicine to give to the sick and suffering (i.e., tantamount to giving a laxative to someone with diarrhea!), Hahnemann came up with a counter-absurdity which he called the Law of Infinitesimals. It states that the more dilute the dose, the stronger its effect upon the healing process.

Potentizing. Hahnemann believed he could "potentize" (ie, a process alleged to release "immaterial and spiritual powers" to make active substances more active; inactive substances active) doses of medicine by repeatedly shaking them (called "succussion"), dumping 9 parts and adding distilled water or alcohol until the doses were diluted to powers of ten. A 3X dose was 1/1,000th, a 6X dose was 1/1,000,000th, and so forth. (Sometimes other Roman numerals are used to denote dilutions such as 3C instead of 6X for 1/1,000,000.)

Hahnemann claimed that tapping the vile on a leather pad or the heel of the hand would double the dilution! Hahnemann believed that these tiny doses would stimulate the body's "Vital Force."

Homeopathic Vitalism. Hahnemann's notions make no sense in light of modern chemistry, but Hahnemann was not just a chemist, he was also a Vitalist. His philosophical beliefs are used by modern homeopaths to justify their nonscientific practices:

...Hahnemann...is...a child of the modern age of natural science, an adept in the chemistry of his day... But he can still hold a conviction that an immaterial vital entity animates our organism until death when the purely chemical forces prevail and decompose it... This vital entity which he characterizes as immaterial, spirit-like, and which maintains in health the harmonious wholeness of the organism, is in fact the wholeness of it... (Twentyman. LR (1982) "The Nature of Homeopathy," <u>Royal Society of Health Journal</u>, 102:221-2125).

Hahnemann's theory of infinitesimals is disproved with every dose-response study done in pharmacology. His metaphysics cannot be disproven, but they can be rejected on scientific grounds.

The Folly of Sectarianism. Homeopathy is a form of sectarian medicine; <u>sect</u>: "A group adhering to a distinctive doctrine or to a leader" (<u>Webster's New Collegiate Dictionary</u>). Sectarian systems do not adhere to objectivity or the pursuit of disconfirmation as do scientists. Rather, they attempt to selectively affirm the tenets of their dogma. Homeopathic advocates allude to 22 studies that they allege confirm the value of homeopathy while ignoring innumerable dose-response studies which disprove the homeopathic Law of Infinitesimals; and, the absence of verification by basic scientists of the Law of Similars, Potentizing or Provings.

Further, the fact that a remedy labeled as "homeopathic" proves to be safe and effective for an intended purpose only serves to validate that specific remedy--not the entire sectarian system of homeopathic philosophy, metaphysics, pharmacology, assumptions, and practices. Every major erroneous theory of health and disease of the past can cite practices which appeared to work according to its theory (see Figure 7). Medical scientists have learned to accept each procedure on the basis of its demonstrated safety and effectiveness, not its imagined theoretical basis.

[Note: Remedies labeled as "homeopathic" may be effective due to adulteration. Morice reports that a homeopathic remedy which appeared to be effective in treating asthma was found to be adulterated with prednisolone and betamethasone. Neither was listed on the label (<u>The Lancet</u>, April 12, 1986, pp.862-863).]

Homeopathic propaganda which claims that vaccinations use homeopathic principles because a disease is prevented by administering a small dose of the same substance misrepresents the facts. Vaccines are not selected on the basis of "provings;" do not become more effective with dilution, and are not affected by "succussion," pounding on leather pads or the heel of the hand.

Allopathy.

[Allopathic medicine in (sic) the process of treating "Likes with Dislikes." It is used counteract the disease processes which manifests itself with obvious symptoms. By removing the symptoms the allopath may arrest the inflammatory process, which allows the body to heal of its own accord. With Allopathic medicine, many more patients survive disease that cannot be brought under control any other way.] (Discipline Directory for Holistic Practitioners)

The term <u>allopathy</u> cannot be discussed without a further reference to homeopathy because Hahnemann coined the term to label the medical practitioners of his day whom he opposed. Consistent with Hahnemann's original use, <u>Dorland's Illustrated</u> <u>Medical Dictionary</u> defines <u>allopathy</u> as: "A...system of therapeutics in which diseases are treated by producing a condition incompatible with or antagonistic to the condition to be cured or alleviated." Likewise, <u>Webster's</u> first definition indicates that "allopathy" is rooted in <u>allos</u> = <u>other</u>; and <u>pathos</u> = <u>suffering</u>, denoting that a remedy was to be given that would elicit symptoms opposite to those being expressed in the patient.

The allopathic concept is traced to ancient Greek cosmology in which disease was thought to be due to an imbalance of the four humors (i.e., blood, phlegm, black and yellow bile) and four conditions (i.e., hot, cold, wet and dry). Fever was believed due to excessive blood humor. The patient was hot and the skin flushed. To balance the humors based upon this "hot" symptom, patients were bled. Other "humoral

imbalances" were treating by this rationale employing purging, puking, blistering and, sometimes, all of these.

Although many modern therapies can be construed to conform to an allopathic rationale (e.g., giving a medication that would produce constipation is a healthy individual to combat diarrhea, or a medication that would produce diarrhea in a healthy person to relieve constipation), scientific medicine has never paid allegiance to an allopathic principle. Rather, both allopathy and homeopathy gave way to the development of medical science.

The label "allopath" is still used in reference to Medical Doctors. This is unfortunate because it is confusing. It is enigmatic because the term "allopath" was once

Figure 7.

Lessons from History: Doing the right thing; for the wrong reason

<u>Practice:</u> Trephining the skull. <u>Theory:</u> Demonic--head pain is caused by an evil spirit needing an escape hole. <u>Value:</u> Relieved intracranial pressure.

Practice: Scraping bronze spear-point shavings into spear-wounds of ancient Greek warriors. Theory: The "like cures like" notion of monism that since a spear made the wound a spear had to be involved in its healing. <u>Value:</u> Probably applied copper sulfate, an antiinfective agent.

Practice: Draining foul-smelling swamps. Theory: To get rid of malaria (mal-air-ia = bad air) based upon the miasmic theory that foul emanations were the cause of diseases. Value: Destroyed the habitat of the Anopheles mosquito.

considered derisive by regular medicine. A 1902 book intended for new medical graduates reveals just how vehemently Medical Doctors once opposed and resented the label "allopath":

... remember that the term "Allopath" is a false nickname not chosen by regular physicians at all, but cunningly coined, and put in wicked use against us, in his venomous crusade against Regular Medicine by its enemy, Hahnemann,...and ever since applied to us by our enemies with all the insinuations and derisive use the term afford. "Allopathy" applied to regular medicine is both untrue and offensive and is no more accepted by us that the term "Heretics" is accepted by the Protestants, ...or "Niggers" by the Blacks. (Cathel DW and Cathel W. <u>Book on the Physician Himself</u>, Philadelphia: Davis, 1902, pp.300-301; in Stalker D and Glymour. <u>Examining Holistic Medicine</u>, Buffalo: Prometheus, 1985, p.34).

The reason "allopath" is applied to medical doctors is because of a second meaning of <u>allopathy</u> provided by Webster's is: "A system of medical practice making use of all measures proved of value in treatment of disease." This alternate definition is an accurate description of regular medicine, but lacks the word roots of the original term.

Significance of a Misnomer. It is clear that "allopathy" is capable of two significantly contradictory meanings; one philosophically defined and the other scientific. Despite the fact that, as a approach to healing, "allopathy" is a relic of the prescientific past, nonscientific health care providers are fond of labeling regular medicine "allopathic" in an attempt to make differences between them appear to be rooted in philosophy rather than a matter of demonstrated merit. Allopathy should be abandoned as a reference to scientific medicine because its word roots define it most accurately. When one is confronted with the term, it is essential that the meaning being given in context be discerned. It is significant that the holistic dental directory uses the philosophical definition.

Chiropractic.

["Chiropractic" is a health care system comprised of diagnostic and therapeutic procedures, aimed at the normalization of nervous system control over human bio-function. The chiropractor provides his patients with relief from structural irritation to the nervous system, which promotes a balanced energy flow throughout the body, resulting in enhanced healing potential and a greater capacity to handle stress.] Discipline Directory for Holistic Practitioners).

"Chiropractic" versus "Chiropractors." It is necessary to differentiate between chiropractic and chiropractors. "Chiropractic is a unique theory about the nature of disease and its treatment. "Chiropractors" are health care providers with Doctor of Chiropractic diplomas practicing within various legal jurisdictions around the world. In the USA, most "chiropractors" practice more than "chiropractic." "Chiropractic," per se, is nearly passe with fewer and fewer practitioners applying its unique tenets. Chiropractic is more a guild of practitioners than a true profession dedicated to scientifically-based health care, and standards of ethical conduct traditional to professionalism.

Spinal Manipulative Therapy. Chiropractors mainly practice Spinal Manipulative Therapy (SMT). A commonly accepted definition of SMT is: "...all procedures where the hands are used to mobilize, adjust, manipulate, apply traction, massage, stimulate or otherwise influence the spine and paraspinal tissues with the aims of influencing the patient's health "Haldeman S. Low Back Pain, Philadelphia: Lippincott Co., 1981, pp.245-275). SMT requires a high level of skill which is found in varying degrees among practitioners much as are dental hand skills. Besides chiropractors, SMT is practiced by physiatrists (i.e., MDs specializing in what was previously termed <u>physical medicine</u>), osteopaths, some orthopedists, physical therapists, and athletic trainers. Chiropractors are usually the most accessible manual therapists in the marketplace. The problem is that they often hold excessive faith in the value of SMT and may apply it for conditions for which there is no scientific justification.

Placebo value of SMT. SMT appears to have above average placebo value. Neher notes that the laying on of hands causes patients to relax and become more suggestible (Neher. <u>The Psychology of Transcendence</u>, Englewood Cliffs: Prentice-Hall, Inc., p.244, 1980). Homola, a chiropractor, describes the SMT as "treatment by suggestion":

...the practitioner places his hands upon the patient's back and applies a sudden thrust, causing the bones to "come together, making a noise like the crushing of an old basket." This thrust, with "popping" of the vertebrae, has a tremendous psychological influence over the mind of the ...patient. While the popping sound itself is quite meaningless, this influence might possibly be used to advantage in curing psychosomatic conditions--provided the patient is informed that the bone is "back-inplace" and will stay there. (Homola. <u>Bonesetting, Chiropractic, and Cultism</u>, Panama City, FL: Critique Books, p.95, 1963).

SMT may, in fact, be under-used clinically by non-chiropractors. There is a considerable amount of data which suggests that SMT will sometimes outperform other types of therapy for back pain and dysfunction. It seems appropriate to state that SMT will work faster that such therapies as medication, corseting, and traction in about one-third of patients with functional back disorders; and, that when it does work, its effects will be realized within two to three weeks (see Haldeman, "Spinal manipulative therapy," <u>Clin Orth & Related Res.</u>, 179:62-70, 1983, for a review of the literature). SMT is not without its dangers. Many cases of serious complications such as paralysis, stroke, and lesser injuries have been reported in the literature.

"Chiropractic"

Chiropractic was created in the mind of Daniel David Palmer of Davenport, Iowa in 1895. Palmer was a laymen who dabbled in Mesmerism, spiritualism, phrenology and animal magnetism (Maynard JE, <u>Healing Hands</u>, Freeport, Long Island, NY: Jonorm Publishing Co., 1959). Chiropractic is founded on the belief that "subluxations" of the spine interfere with "nerve flow" thus impeding the flow of vital force to various parts of the body. A chiropractic textbook describes its Vitalistic theory:

The founder of the science of chiropractic appreciated the working of Universal Intelligence (God); the function of Innate Intelligence (Soul, Spirit or Spark of Life) within each; which he recognized as a minute segment of Universal; and the fundamental causes of interference to the planned expression of that Innate Intelligence in the form of Mental, Chemical and/or Mechanical Stresses, which create the structural distortions that interfere with nerve supply... (Homewood, AE, <u>The Neurodynamics of</u> the Vertebral Subluxation, Canada: Chiropractic Publishers, p.80, 1973)

Chiropractic vitalism has been dubbed "biotheology" by reformist chiropractors. Palmer clearly was a metaphysician in his pronouncements:

The philosophy of chiropractic teaches the Universality of Intelligence and that its aim is always onward and upward toward perfection. This truth makes the practice of chiropractic a moral and a religious duty in both theory and in fact. ...

Morally, chiropractors are in duty bound to help humanity physically. Religiously, they are required to render spiritual service toward God, the Universal Intelligence, be relieving mankind of their fetters, adjusting the tension-frame of the nervous system, the physical lines of communication to and from the spirit. By so doing they greatly aid intellectual attainment and progress toward perfection through the untrammeled, mental reception of intelligent expressions of individual spirits. By correcting the skeletal frame the spirit is permitted to assume normal control, and produce normal expression. (Palmer DD. <u>The Chiropractor</u>, Los Angeles: Beacon Light Printing Co., pp.6-7, 1914). Sectarian chiropractors (called "Super Straights" or "Radical Religious") still cling to Palmer's biotheological notions. Life is much simpler for them--they are true believers. Chiropractors who deny Palmer's metaphysical philosophy about the Innate Intelligence, engage in word-games about the nature of subluxations and their effects.

Scientific Status: Validity of the "Subluxation." Chiropractors have never defined in measurable terms what a "subluxation" is (Dorland's medical definition: "an incomplete or partial dislocation" is not synonymous with the chiropractic version), or how it quantitatively affects nerve impulses. When pressed as to their basis for practice they must face the physiological facts described in a scientific brief on chiropractic:

No chiropractor has ever defined, either quantitatively or qualitatively, what chiropractic means by perturbation of nervous impulses. Is it their number, their frequency, the speed of their propagation, or their wave patterns which are affected? All of these can be identified, recorded, and studied.

If there is partial blockage of impulses in a nerve fibre...the impulse is transmitted more slowly in a zone of partial blockage, and resumes <u>all</u> (emphasis added) its characteristics as soon as it reaches normal tissue....Thus, it is impossible for a partial blockage of nerve impulses in a particular zone to affect the flow, since the impulses would resume their normal flow. ("The Scientific Brief Against Chiropractic," <u>The New Physician</u>, September, 1966).

Anatomist Edmund Crelin, PhD, put the chiropractic theory to the test by attempting to produce subluxations that would impede upon spinal nerves under laboratory conditions. He showed that he had to produce disabling injuries to accomplish this. (Crelin, "A scientific test of the chiropractic theory," <u>Amer Scient</u>, 61:574-580, 1973).

Unsupported by science, chiropractors must either fall back upon Palmer's Vitalistic philosophical theory or admit that the "subluxation" theory is erroneous. When this occurs, chiropractors are reduced to manipulative therapists practicing a very limited modality shared by physiatrists, osteopathic physicians, sports trainers, physical therapists, and others. Without the theory, chiropractic's claim that it is a unique and comprehensive "alternative" to regular scientific medicine is lost.

Scientific Status: Clinical Reliability. Laboratory failings do not daunt chiropractors. They feel capable of finding subluxations clinically even if objective methods for doing so are lacking. However, chiropractors have yet to pass a scientific test of interexaminer reliability. Numerous studies of the ability of two or more chiropractors to find the same "subluxations" on either the same x-ray or in the same patients have repeatedly failed (Smith RL. <u>At Your Own Risk: The Case Against Chiropractic</u>, New York: Pocket Books, 1969; Barrett S. <u>The Health Robbers</u>, Philadelphia: Stickley, 1980).

A significant failure by an official delegation of chiropractic representatives, including a radiologist of their own choosing, to identify a single subluxation on a series of twenty x-rays that had been submitted for insurance reimbursement to the National Association of Letter Carrier's led Medicare to require that chiropractors verify subluxations by x-ray. A 1986 report by the Inspector General of the Department of Health and Human Services revealed that chiropractors are largely not meeting the legal requirements of Medicare (treatment of subluxations demonstrated by x-ray). (Kusserow RP. Inspection of Chiropractic Services Under Medicare, Washington, D.C.:Health and Human Services, 1986). A Legal Dilemma. The dilemma chiropractors face is the fact that the practice acts under which they practice either mention "subluxations" specifically or undeniably describe them as the basis for chiropractic practice. Chiropractic's scope of practice is not defined in terms of a portion of the anatomy or specific disorders. The subluxation theory may be adapted to any disorder in anything with a spine. Unable to demonstrate their existence, chiropractors can only talk about "subluxations" on faith. The word games they play with the concept remind one of the "Emperor's New Clothes."

The American Chiropractic Association has attempted to cope with chiropractic's unique, pseudoscientific theory by officially acknowledging that it is only a supposition; they say:

Scientific Theories of Chiropractic

Chiropractic is based upon three related scientific theories:

1. Pathological disease processes may be influenced by disturbances of the nervous system.

2. Disturbances of the nervous system may be the result of derangements of the musculoskeletal structure.

3. Disturbances of the nervous system may aggravate pathological processes in various parts of the various functions of the body. American Chiropractic Association. <u>Chiropractic State of the Art, 1986</u>.

It is well-established in law that the word "may" also says "may not." The ACA statement about chiropractic's alleged scientific basis appears to be an extremely shaky premise upon which to build an "alternative" health care delivery system.

The chaotic state of chiropractic theory is clearly demonstrated by the variety approaches to treating "subluxations" practiced by various factions within the guild. At least a dozen distinctly different approaches to correcting "subluxations" exist. Some manipulate only the atlas, others only the cervical vertebrae, others just the sacrum, others atlas and sacrum, still others the whole spine, and others specific vertebral level. Some measure leg lengths and correct the spine with heel-lifts.

"Chiropractors"

Most chiropractors have moved away from "chiropractic" and have become Eclectics: "a sect or school which professes to select what is best from all other systems of medicine." (Dorland's Illustrated Medical Dictionary). In 1981, Mark Brown, associate editor of the <u>Quad City times</u>, conducted a six-month study of chiropractic in his area. He presented his findings in a 36-page sunday supplement entitled, "Chiro: How Much Healing, How Much Flim Flam? A special report on Davenport's home-grown health profession," (Quad City Times, December 18, 1981). Brown found chiropractors engaging in a plethora of activities that go far beyond SMT, subluxation theory, or anything else rational. In their pragmatic adaptation to the health care marketplace, chiropractors will do just about anything they can get away with. Although. chiropractors jealously protect their turf as practitioners of SMT, they regularly invade the domains of other health care providers. In doing so, chiropractors generally practice their own variations of physical therapy, dietetics, psychological counseling, sports medicine, obstetrics, and even veterinary medicine. Many of their approaches are pseudoscientific. Such intrusions sometimes cause legal conflict with other health care providers. Chiropractors have managed to win many turf battles by employing a political astuteness learned over the years.

The myth of druglessness. Brown (Quad City Times op cit) noted that chiropractors

don't prescribe drugs but dispense a substantial number of OTC pills. This is done with little if any scientific justification, includes numerous questionable supplements (glandulars, megavitamins, enzymes, herbals), and often involves direct sales to their patients. On September 7, 1987 the Supreme Court of Georgia ruled that chiropractors may not prescribe dietary supplements for the prevention or treatment of any condition because they were licensed as "drugless practitioners," and the use of dietary for medical purposes made these substances drugs under the law. Drugs are legally defined as:

"(A) article recognized in the official United States Pharmacopeia, official Homeopathic Pharmacopeia of the United States, or official National Formulary, or any supplement to any of them;

(B) articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals;

(C) articles (other than food) intended to affect the structure or any function of the body of man or any other animals;..." (Section 201, Food, Drug and Cosmetic Act).

Parts (B) and (C) above show that a substance is a "drug" when applied for specific medical purposes.

Inroads Into Dentistry.

Chiropractor-driven pseudosciences have made several inroads into dentistry. The most prominent is "Applied Kinesiology" (A-K).

"Applied Kinesiology." A-K should not be confused with the real science of kinesiology which is the study of the mechanics of muscular-movement. The holistic dentistry directory describes A-K as:

[Applied Kinesiology is a Contact Reflex Analysis System that is used to obtain objective information from a patient. With it we are able to evaluate all the different disciplines of dentistry and related treatment modalities. for the benefit of the patient. It is concerned with smooth and striated musculature and the neurological system of these muscles. It can be used to evaluate structural, chemical and mental stress of the health of a patient and the methods best suited to improve or maintain these areas.] (Discipline Directory for Holistic Practitioners)

A-K can be very convincing on a subjective, personal level. People are impressed when they test strong and weak on various tests. Practitioners and patients alike can be fooled when they employ this faulty method of validation in an uncontrolled manner. Controlled studies have repeatedly found response to become random under blinded conditions. Friedman and Weisberg (J. Prosthetic Dentistry, 45:321-323, 1981) found suggestion to play the major role in subjects' responses to testing with and without sugar. Triano (J. Manipulative & Physiological Therapeutics, 5:179-182, 1982) rejected the A-K hypothesis of a consistent relationship between muscle-response and nutritional supplements using glandular extracts. Kenney (J. Amer. Dietetic Assoc., 88:698-704, 1988) found A-K no better than random guessing when testing three experienced applied kinesiologists (1) for interexaminer reliability; (2) correlation with standard laboratory tests for nutrition status; and, (3) correlation between mechanical and manual determinations of relative muscle strength.

An elaborate "dental kinesiology" chart claims to present associations between specific teeth (n = 16), muscles (n = 40), nutrients (n = 60 +), organs (n = 26) and alleged acupuncture meridians (n = 14). The potential number of correlations mathematically

possible becomes staggering. When quizzed as to how so many possible associations could have been tested, a leading promoter of A-K stated that it was not accomplished scientifically, but done by "psychic" means (Jarvis W and Kravitz E. "Food fads and fallacies," in <u>Nutrition in Oral Health and Disease</u>, editors: Pollack and Kravitz, Philadelphia: Lea & Febiger, 1985).

Posture and TMJ Dysfunction. Chiropractors who measure leg-lengths as their primary method of analysis claim to help a wide range of musculoskeletal problems. including TMJ dysfunction. Although few would doubt that significant differences in leg-lengths could cause joint problems throughout the body, the differences that such practitioners claim to find are likely to be within the normal variations found among healthy people. Allegedly, alterations in posture caused by uneven leg-lengths may be responsible for TMJ dysfunction. However, a report by Darlow et al (J Amer. Dental Assoc., 114:73-75, 1987) found no relationship between myofacial pain and posture. Mark Brown (Quad City Times, op cit) reported the amusing findings that "both legs are shorter than the other" when two independent chiropractors found conflicting measurements.

Craniopathy. Perhaps it would be more accurate to describe craniopathy as a "Semichiropractic" technique since both chiropractors and fringe osteopaths lay claim to the procedure described in the <u>Holistic Dental Directory</u> as <u>cranial osteopathy</u>.

[Cranial Osteopathy is a comprehensive system of diagnosis and therapy, based on the interrelationship of anatomy and physiology for the study, prevention, and treatment of disease. It is based on the understanding that motion is fundamental to life and that all parts of the body and cranium must be in the correct position and free to move, or else life cannot exist. Through Cranial Osteopathy techniques, the patient can have his cranial bones 'freed up' for proper functioning of the health and thus the entire body.] (Discipline Directory for Holistic Practitioners)

Chiropractors call their version <u>craniopathy</u>, but the mechanisms are the same for practical purposes. Despite the fact that a number of papers have been published on the topic in osteopathic journals (none of which answer the important clinical questions), the American Osteopathic Association and researchers at the Michigan State University College of Osteopathic Medicine have failed to respond to repeated inquiries about the validity of the technique for specific conditions; whether or not it is taught to DO students; if so, how they are taught to employ it; and, their official opinions of it. Chiropractic journals carry articles about craniopathy, but do not provide scientific information.

Evaluating Individual Chiropractors. Medical and dental health professionals sometimes wish to utilize the skills of a manual therapist. Chiropractors may be the most readily available practitioners. Some chiropractors practice in a rational, conservative manner and have some useful manual therapy skills. Due to the wide diversity of practitioners within the chiropractic guild, it is necessary that each be evaluated on an individual basis.

The notion that rational vs. irrational chiropractors can be separated on the basis of whether they are Straights or Mixers is a common error. In fact, such a dichotomy is based entirely upon whether they exclusively practice SMT or mix in other modalities. It is more important to ask why they perform SMT (i.e., what they believe occurs physiologically when they manipulate the spine). Chiropractors who readily admit that they are relieving back pain, reducing muscle spasms, restoring the range of motion of impaired joints, and that the effects are apt to be temporary--probably are rational. On the other hand, if they believe they are removing the "cause" of disease

or "improving the body's self-healing ability," be skeptical. Other criterion for evaluating individual chiropractors would include:

(1) their use of pseudoscientific procedures such as muscle-testing, craniopathy, colonics, crystal healing, iridology, reflexology, pseudonutrition, color therapy and so forth;

(2) their unjustified opposition to scientifically valid public health procedures such as fluoridation, immunization, pasteurization and modern food technology, prescription drugs and surgery.

Anyone referring patients to a chiropractor should find out their x-ray practices. Some practitioners x-ray patients repeatedly (as often as weekly!) It would be prudent to ask an attorney about the degree to which a dentist might be held accountable for harm done to a patient who had been referred to a chiropractor who turns out to be irrational. It must be remembered that chiropractors live in a world apart from science. They have been educated to believe in pseudoscience. Their journals abound with ads and articles promoting pseudoscience. It is little wonder that honest, well-meaning chiropractors can become deceived and deluded.

There is a reformist organization of chiropractors who reject the sectarianism and pseudoscience of the Straights and Mixers. It is the National Association for Chiropractic Medicine (NACM). (Slaughter R. "Chiropractors want new profession." <u>Medical World News</u>, August 10, 1987, p.58). Membership is the NACM would help reassure people that the chiropractor is rational.

Eclectic chiropractors are indistinguishable in their practices from naturopaths. Since naturopathy is legal in only seven states in the U.S., chiropractors fill the naturopathic role in most jurisdictions. For this reason, plus the fact that the author knows several dentists who also practice as naturopaths, information on naturopathy is provided as part of chiropractic.

Naturopathy.

Naturopaths are eclectic in their approach meaning that they don't follow a single unity theory--such as chiropractic's "subluxation" theory--but choose methods that they personally consider best (based upon empiricism) from a wide variety of healing theories . Unfortunately, the Naturopaths strongly favor vitalistic theories and nonscientific practices. As Vitalists, naturopaths commonly employ methods which are based upon the concept of Life Force. The National College of Naturopathic Medicine's 1984-85 catalog states:

Although the name "Naturopathic" is of relatively recent origin, the philosophical basis and many of the methods of naturopathic medicine as ancient. The modern naturopathic physician is a true inheritor of the Hippocratic tradition in medicine." In its statement of philosophy reference is made to the <u>vis medicatrix naturae</u>", the vital healing force elaborated by Hippocrates, and states that this concept "is the foundation of naturopathic philosophy and practice."

The naturopathic version of the <u>vis medicatrix naturae</u> can be misleading. Hippocrates sought to differentiate between a natural versus a supernatural basis for disease causation. His notable contribution as the "Father of medical science" is based upon his teaching that disease and healing were not supernatural phenomena under the control of capricious gods, but that they were natural and malleable. He invented the term "physician" using the root word <u>physikos</u>--the Greek word for "nature":

...to denote that every practitioner of medicine was to be skilled in Nature and must strive to know what man is in relation to food, drink, occupation and which effect each of these has upon the other" (Dubos R, <u>Mirage</u> of <u>Health</u>, New York: Harper & Row, 1959).

"Physician" literally means "nature doctor" making the term "naturopathic physician" redundant. Despite its attempt to link itself with Hippocrates, naturopathy condemns "allopathy," which is credited to Hippocrates by historians.

The naturopathic physician uses those therapeutic substances and techniques which act in harmony with the body's self-healing processes and <u>avoids treatments which are designed to counteract or supervene</u> them (emphasis mine). (The National College of Naturopathic Medicine's 1984-85 catalog).

Of course, naturopathy would not be criticized for avoiding Hippocrates' brand of allopathy (i.e., bleeding, purging, puking, etc. to balance the four humors), but that is not the case. Naturopaths pervert medical history and current reality by claiming that modern medicine is aimed only at suppressing symptoms. Regular medicine is condemned as a method which seeks to "suppress or contravene" the symptoms of disease failing to recognize that symptoms are the body's attempts at self-healing (ie, "body wisdom") and should be encouraged.

Body wisdom. The notion that symptoms represent a special "body wisdom" is one of the major flaws and most dangerous aspects of naturopathy. This half-truth, Like so many aspects of nonscientific health care, can be made to seem true if one is selective. For instance, fever may be hypothesized to represent a natural sterilizing process and linked to hyperthermia which is an experimental cancer therapy with some promise; edema following a snake-bite can be rationalized as the body's attempt to dilute the poison by bringing excess fluid to the site; and, pain can easily be shown to be the body's message to quit doing something such as holding your hand on a hot stove.

As rational as some examples may be, they do not justify generalizing "body wisdom" as a universal principle. The reality is that the body is not wise or self-healing in every instance. Following injury the body often over-reacts to its own destruction. Traumatic shock probably kills more people that the injuries themselves. Edema following head injuries may create lethal intracranial pressure. In the case of autoimmune disorders the body attacks itself causing destructive inflammatory responses. Body wisdom also fails to warn of serious disorders. Minor injuries, hangnails and bumps can cause distracting pain while lethal disorders such as cancer, hypertension, kidney disease, and atherosclerosis are symptomless until its too late.

The most dangerous application of the misguided naturopathic notion of body wisdom is the advice to ignore, and even rejoice over, adverse reactions to herbs, megavitamins, and other "natural" potions on the theory that such are caused by "toxins" being "cleansed" from the body (this is often referred to as a "healing crisis" by naturopaths). Such advice led to the death of a 35-year-old Herbalife salesman, Bivian Lee.

Lee had recently retired from the New Orleans Saints NFL team. He was in good health according to a life insurance physical six-months earlier. Lee read advice by Stanley Bass, ND, DC, PhC (Philosophy of Chiropractic) that adverse symptoms should be expected and welcomed:

...when a person follows these rules...remarkable things begin to happen to the body as well as the mind. The amazing intelligence present in every cell of the body and the wisdom of the body in its operation immediately becomes manifest. The rule may be stated thusly: when the quality of the food coming into the body is of higher quality than the tissues which the body is made of, the body begins to discard the lower grade materials ...the body ...ALWAYS (emphasis his) tries to produce health...

They ask, "How come: I'm eating better now than I ever was before, and instead I'm getting worse?" They don't understand that the body is "retracing." ...The toxins being discarded are saving you from more serious disease which will result if you keep them in your body too much longerpossibly hepatitis, kidney disorders, blood disease, heart disease, arthritis, nerve degenerations or even cancer--depending upon your hereditary or structural weaknesses. Be happy you're paying your bills now in an easy payment plan.

With some, colds which haven't appeared for a long time may occur, or even fevers. THIS IS NATURE'S WAY OF HOUSECLEANING (emphasis his)DON'T--but DON'T try to stop these symptoms ...These symptoms are part of a curing process, and don't try to cure a cure.

Those who have lived worse lives and poisoned themselves more will experience more severe symptoms... Headaches may occur at the beginning; fever and/or colds may appear; the skin may break out; there may be a short interval of bowel sluggishness, occasional diarrhea, feelings of tiredness and weakness, disinclination to exercise, nervousness, irritability, negativity or mental depression, frequent urination, etc....

REALIZE DEEPLY (emphasis his) that your body is becoming younger and healthier every day because you are throwing off more and more wastes which would eventually have brought pain, disease and suffering. Those who have the worst symptom -- reactions and follow through to their successful termination are thus avoiding some of the worst diseases which would eventually have developed had they continued their careless eating habits. (Bass. "What Symptoms to Expect When You Improve Your Diet," in <u>Herbalife Distributor Product and Sales Training Information</u>, Metairie, LA [undated])

The notion that adverse symptoms should be disregarded or rejoiced about most likely caused Lee to ignore serious symptoms of cardiac myopathy. When Lee blackedout, an appointment was made to see a physician, but he died before it could be kept. The Herbalife company paid his widow a substantial (undisclosed) out-of-court settlement rather than defend its failure to control such misinformation.

Appeal. Naturopathy's appeal lies in its claim to be "natural, preventive and holistic." These are fine accolades, but what do they really mean in operational terms? No matter how appealing its rhetoric, naturopathy must ultimately judged by what it does and its results.

A review of the only two naturopathic schools which can be taken seriously shows that the course of study includes a mixture of past medical discards (e.g., colonics, water therapies, herbalism), pseudosciences (e.g., acutherapy, homeopathy, gravity guidance, hair analysis for nutritional assessment, cleansing) and modalities expropriated from biomedicine (e.g., nutritional counseling, hypnosis, natural childbirth, psychological counseling) which are most likely taught by more a qualified faculty and applied with greater restraint by better trained and more rational practitioners.

QUESTIONS

- 1. The type(s) of holistic health that Vanderpool judges to be valid is:
 - a. the biopsychosocial model.
 - b. the whole-person medical care concept.
 - c. high-level wellness
 - d. all of these
 - e. none of these
- 2. The belief that the functions of a living organism are due to factors beyond the observable physicochemical forces describes:
 - a. reductionism
 - b. Vitalism
 - c. monism
 - d. alchemy
 - e. all of these
- 3. EAV Acupuncture is:
 - a. a true form of Chinese Medicine
 - b. a chiropractic creation
 - c. a form of "energy medicine"
 - d. established scientifically
 - e. all of these
- 4. Homeopathy's principles are demonstrated in the manufacture of immunization drugs. a. true
 - b. false
- 5. The fact that a remedy works according to its overall theory is proof that the theory is correct.
 - a. true
 - b. false
- "Treating symptoms with substances that produce opposite responses in healthy individuals" describes:
 - a. homeopathy
 - b. naturopathy
 - c. chiropractic
 - d. allopathy
 - e. none of these
- 7. The chiropractic subluxation theory is:
 - a. scientifically unproven by chiropractors
 - b. disproved by Crelin
 - c. undefined in testable terms by chiropractors
 - d. chiropractic's unique basis for practice.
 - e. all of these
- 8. The dangerous idea that adverse symptoms should be ignored is most directly associated with:
 - a. naturopathy's body wisdom theory
 - b. homeopathy's Law of Similia theory
 - c. chiropractic's subluxation theory
 - d. acupuncture's meridian theory
 - e. none of these

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PART THREE

DENTAL PSEUDONUTRITION

Introduction Nutrition Science and Behavior Nutrition science **Dietary Behavior** Why Food Faddism Persists The Pseudonutrition Industry "Health Foods" Pseudonutrition as Pseudomedicine Practitioners of Pseudomedicine "Nutrition Consultants" (1) Spurious Credentials (2) Invalid Methods of Health / Nutrition Assessment Iridology Live Cell Analysis **Blood Crystalization Analysis** Herbal Crystalization Analysis Lingual Vitamin C Test Pendulum Divining **Computer-Analyzed Questionnaires** The Yeast Test Testing for Food Allergies Cytotoxic Test Applied Kinesiology Hair Analysis Alleged Amalgam Toxicity Roy Kupsinel, MD Enhancing the Procedures (3) Inappropriate Prescription Practices Multilevel Marketing through the Dental Office Proponents of Dental Pseudonutrition "Balancing Body Chemistry" Weston Price, DDS (1) Malnutrition and Dental Caries (2) Genetics and Rampant Caries (3) Dietary Abuses Francis Pottenger, MD Granville Knight, MD Melvin Page, DDS Emanuel Cheraskin, MD, DMD Nutrition Fallacies Agriculture-Related Food Processing: Additives Food Processing: Deductives Sucrose Fallacies Dietary Supplementation Diet Cures Questions

Dental Pseudonutrition

Introduction

Articles in the dental literature (1,2) have suggested that dentists add nutrition counseling to the services they offer. Advocates argue that dentists are qualified to do nutrition counseling based upon their training in oral health and nutrition science, and claim that nutrition counseling can markedly increase dentists' income. Before adding nutrition counseling to their practices, dentists should consider several facts. First, nutrition counseling is not likely to be lucrative unless practitioners sell supplements to their clients. Registered dietitians have had great difficulty making a financial success of private practice nutrition counseling. Sound dietary advice is like "sensible shoes," and patients rarely need special products. Knowledge about how to make better food choices, coping strategies to deal with the behavioral aspects of eating, information on the role of exercise, and some culinary skills may be all that is needed. Patients needing complex nutritional counseling often require medical guidance.

The idea that dentists are adequately trained to do comprehensive dietary counseling is open to challenge. Dentists are well-trained in clinical dentistry and may have sufficient training to make dietary recommendations relating to dental health, but it is grandiose to believe that dentists possess the knowledge and skills required to be nutrition counselors. Abraham Nizel, DMD, MSD, Professor of Nutrition and Preventive Dentistry at Tufts University has shown that valid dental nutrition counseling can be done (3). His book is a standard reference for sound practice. It reveals that a dentist would require several years of additional professional training to be able to perform at an acceptable standard of practice.

Dentists are not immune to food faddism, as we shall see in this section. Instruction in the basic sciences has not insulated them from pseudonutrition. Curiously, authors advocating that dentists become nutrition counselors often propound a disturbing amount of nutrition misinformation in their writings. Invalid methods for assessing nutritive status have been advocated. The unwise practice of selling supplements directly to patients has been defended despite the obvious conflict of interest and doubtful ethics involved. Questionable supplements are being promoted, and some unreliable sources of nutrition information advocated. The poor quality of the advice in the articles encouraging dentists to go into nutrition counseling is in itself among the strongest arguments against the proposition that they are qualified to do so.

Dentists who wish to offer qualified nutrition counseling to their patients are advised to either undergo more training or engage the services of a registered dietitian who can come in on a full or part-time basis. (See: Ehrlich. "Nutrition counseling: proceed with caution," <u>Dental Economics</u>, pp.53-56, September, 1985; and Elbon & Karp, "The dietitian as a member of the dental health care team," <u>J. Amer Dietetic Assoc</u>, 87:1062-3, 1987).

- 1. Dental Economics, 9/85.
- 2. Dental Management, 12/88.
- 3. Nizel, <u>Nutrition in Preventive Dentistry: Science and Practice</u>, Philadelphia: W.B. Saunders Co., 1981.

Nutrition Science and Behavior

Nutrition Science.

Nutrition is an multidisciplinary science made up of a number of highly developed fields as Figure 7 indicates. As is true with all sciences, nutrition knowledge will continue to advance, however, certain aspects are finite. Nutrition science has enough understanding of human nutritional needs that people can now be kept in good health in arctic outposts, long undersea voyages, and extended space flights. Even more impressive is the fact that patients, some without digestive organs, can be nourished exclusively through total parenteral nutrition.

Less is known about the long term effects of various dietary practices, but even many of these have been explored. Epidemiologists have learned enough to enable the National Academy of Sciences (1) and U.S. Surgeon General (2) to issue firm guidelines on nutrition and health. The limitations of epidemiological findings are that they are applicable only to groups of people, not to individuals. The presence of a risk factor is no quarantee that the individual be afflicted with the disease and its absence is no guarantee that he or she will not. There will always be tension between solid advances within nutrition science and the findings of epidemiology.

- I. National Research Council. Report on Nutrition and Health, Washington, DC: National Academy Press, 1989.
- 2. The Surgeon General's Report on Nutrition and Health, Washington, DC: U.S. Dept of Health & Human Services, 1988.

Dietary Behavior.

Nutrition is a science, but food beliefs and behavior are only partially based upon Nutrition beliefs and attitudes are based upon symbolic, scientific knowledge. emotional, philosophical perceptions of foods than factual knowledge. Foods are commonly stigmatized as "bad" or eulogized as "good" based upon folklore. Deutsch refers to this as "foodism" (1). Moore differentiated food and eating per se. Breaking bread, sharing salt, banqueting, and the wedding breakfast symbolize much beyond food. Feasting versus fasting have great social significance. The maternal aspects of feeding have powerful behavioral significance. Food expresses cultural meanings; for example:

*Meats are masculine; vegetables are feminine. *Visceral-cuts (sweetbreads, tripe) bespeak poverty; muscle-cuts prosperity. *Fruits express affection and luxury. *Olives are for grown-ups; peanut butter is for children. (2)

1. <u>The New Nuts Among The Berries</u>, Palo Alto: Bull Publ., 1977. 2. "The meaning of food," <u>Amer J Clin Nutr</u>, 5:77-82, 1957.

Why Food Faddism Persists.

Food faddism (ie, unscientific nutrition-related beliefs and practices characterized by exaggerated expectations about the value of nutrition in health and disease) is pervasive and extends into nearly every aspect of human health. Food faddism persists for at least three important reasons:

(1) Deep cultural roots.

The basic premise of food faddism is that diet is the primal factor in health, disease. intellect, behavior (ie, mood, morality, sexual passion, spirituality, performance, etc.) because "you are what you eat." This is a half-truth that says too much by overlooking, exercise, genetics and other environmental factors which affect bodily composition and function. Its beginnings can be traced to primitive notions about



Figure 7. Knowledge of Nutrition of Man

NULL.

Methods and areas of investigation that led to the development of the science of nutrition.

Lowenberg, et al. Food & Man, New York: John Wiley & Sons, Inc., 1968.

eating the heart of a lion for courage, genitals for virility, or eggs for fertility (1) (ie. monism's "like makes like" principle). Every primitive culture exhibits important foodrelated symbolism which is not differentiated from food therapy "Hot" versus "cold" foods are significant in many cultures (2,3).

- McNeely & Wachtel. "They use everything but the cat's meow." International Wildlife, 1. May-June, 1981. 2
- 3
- Whang. "Chinese traditional food therapy." <u>J Amer Diet Assoc</u>, 78:55-57, 1981. Vargas. "Food ideology and medicine in Mexico," in <u>Current Topics in Nutrition and</u> Disease, Volume 10; Malnutrition: Determinants and Consequences, White and Selvey editors. New York: Alan Liss, Inc. 1984.

(2) Nutrition misinformation and misbelief are endemic.

Misinformation and misbeliefs about food are as diverse as are the sciences encompassed by nutrition science. These begin on the agricultural level, proceed through food technology, and extend to exaggerated notions about the ability of diet to cure serious diseases. In logical sequence, the common misbeliefs of food faddism are that:

- A. Soil depletion and modern farming methods make foods unhealthful.
- B. Modern food processing destroys food value and adds dangerous chemicals.
- C. Everyone needs to take food supplements to insure good nutrition.
- D. Megadoses of nutrients provide "supernutrition."
- E. Special diets, foods, nutrients or herbs are curative.

A national study revealed that nutrition misbeliefs are widespread (Figure 8). When a statement was true, respondents where more likely to disagree, and vice-versa. More recent surveys have found that negative beliefs have increased. The percentage of consumers fearful of food additives leveled off at about 57% in the late 1970s (1).

Figure 8.

Percentage agreeing with statements about food supply healthfulness

Statement	Percentage agreeing 48	
The chemicals added to our manufactured food take away much of its value for health. (FALSE)		
2. Man-made vitamins are just as good as natural vitamins. (TRUE)	35	
 Much of our food has been so processed and refined that it has lost its value for health. (FALSE) 	60	
Chemical sprays that farmers use make our food a danger to health, even if they are used carefully. (FALSE)	57	
There is no difference in food value between food grown in poor, worn-out soil and food grown in rich soil. (TRUE)	15	
5. Many foods lose a lot of their value for health because they are shipped so far and stored so long. (FALSE)	73	
P. Food grown with chemical fertilizers is just as healthful as food grown with natural fertilizers. (TRUE)	44	

National Analysts. A Study of Health Practices and Opinions, Springfield, VA: US Dept of Commerce, 1972.

The apparent distance between scientific nutrition knowledge and that of the general population is enormous. Many of societies thought leaders, teachers, coaches, ministers, health professionals, consumer groups, the media, and others in positions to influence the public, possess a substantial amount of common nutrition misinformation. In addition, a great deal of misinformation is advanced through questionable advertising and promotions (2).

- Maracom Research Corporation and Nutrition and Marketing Research Departments of General Mills Inc. Dewline Changing consumer values and behavior related to food Minneapolis: General Mills, Inc. Report 15, 1980.
- 2. Resource Conference on Food Faddism and Cultism, Chicago 1971

(3) Consumer protection laws are weak.

Prior to 1906, adulteration and the use of toxic substances in foods and drugs was common. The Pure Food and Drug Act passed that year signaled the beginning of consumer protection on the federal level. The new law made it mandatory that information on ingredients be provided on the labels of drugs (ie, substances alleged to prevent, diagnose, alleviate, mitigate, treat or cure a disease). Outrageous claims for the effectiveness of patent medicines were not covered. It wasn't until 1912 that the Sherley Amendment prohibited false claims for drugs. In 1938, the Food, Drug & Cosmetic Act replaced the 1906 law and included the requirement that drugs be proven safe prior to marketing. This meant that proponents would bear the burden of proof. In 1958 food additives were required to be proven safe before marketing rather than enjoying the assumption of "innocent until proven guilty" (i.e., the so-called "rule of science" vs "rule of law"). In 1962, the Kefauver-Harris Amendments required that drugs also be proven effective for their intended purposes before marketing. All of these enactments reflected the consumer protection principle of caveat vendor (ie, let the seller beware) which is based upon the presumption that buyers are on a disadvantageous unequal footing with sellers. In 1976, medical devices were added to the health products required to meet the principle of caveat vendor. Figure 9 summarizes advances in consumer protection legislation.

Figure 9.

Year	Legislation	Accomplishment
1906	Pure Food & Drug Act	Truth in labeling
1912	Sherley Amendment	Truth in advertising
1938	Food, Drug & Cosmetic Act	Premarketing safety of drugs
1958	Food Additives Act	Premarketing safety
1962	Harris-Kefauver Amendments	Premarketing efficacy of drugs
1 976	Medical Device Amendment	Safety & efficacy required

Consumer Protection Law Landmarks

Paradoxically, in 1976 the Congress also passed the only federal legislation in this century which went against the trend of disclosing accurate information and requiring safety and effectiveness. "The Proxmire Bill" limited the FDA's ability to regulate either the safety or effectiveness of dietary supplements. The FDA was required to prove eminent danger before a dietary supplement could be challenged, and dietary supplements were not required to be efficacious. Such products do not even have to be necessary human nutrients to be sold. This gave rise to the unbridled promotion of useless and unnecessary dietary supplements such as bioflavonoids, amino acids, glandulars, and the like (See: Herbert. "Pseudovitamins," in Shils and Young. <u>Modern Nutrition in Health and Disease</u>, Philadelphia: Lea & Febiger, pp.471 + . 1988). At the time of its enactment, then FDA Commissioner Alexander Schmidt called the bill "a charlatan's dream."

6

The Pseudonutrition Industry.

A multibillion dollar industry thrives upon nutrition pseudoscience. It is a multifaceted industry running counter to scientifically-based food and medicine. This sham industry is nearly complete in its scope. It has developed its own educational system, certification agencies, authorities, writers, publishers, retail stores, over-the-counter drugs component, trade associations, and even health care practitioners. It is wellentrenched politically and economically enjoying protection by business laws designed to encourage open competition.

"Health Foods." The pseudonutrition industry's retail outlet is primarily through socalled "health foods" stores (Note: This is not a universal condemnation of all health food stores since a few do make a serious effort to offer only sound products and information). The health foods industry is actually a specialty foods industry. It is the most profitable dimension of the overall food industry with a profit margin that is about 80% greater than conventional foods (1). In reality, health foods are not healthier. Health food snacks are often more cariogenic than conventional varieties (2); are as apt to be contaminated with undesirable chemical residues (3,4,5) and filth (6,7). Health foods promoters simply create the illusion of health through clever marketing and labeling strategies.

The Federal Trade Commission spent more than two years studying the terms used in food advertising hoping to put more truth and accuracy into marketing. All dimensions of the food industry testified and presented evidence. The FTC Staff recommended that the term "health foods" be banned. The FTC stated:

The term "health foods" is inherently deceptive in that it falsely attributes special or superior health-giving properties to certain foods. Moreover, the term is not capable of being qualified or defined in any meaningful fashion (8).

Despite strong recommendations from the FTC staff, none of the reforms were adopted. Buyer beware still prevails when it comes to dietary supplements.

- 1. Bidlack. "Nutritional quackery: selling health misinformation," California Pharmacist, 36:34-43, February, 1989.
- Martin & Berry. "Cariogenicity of selected processed machine-vended and health food 2. snacks," <u>J Amer Diet Assoc</u>, 75:159-161, 1979 3. Appledorf, et al., "Health foods versus traditional foods: a comparison," <u>J Milk Food</u>
- Technol, 36:242-244, 1973; 4. Jukes. "Organic food," <u>CRC Critical Reviews in Food Science and Nutr</u>, pp.395-418, November, 1977;
- "Are 'health foods' really more healthful?" Tufts University Diet and Nutrition Newsletter, 5 6:7, 1988);
- "Its natural, its organic, or is it? Consumer Reports. July, 1980. 6.
- "Spirulina: a miracle food its not," FDA Consumer, June, 1982). 7.
- 8. FTC Staff Report and Recommendations. (1978) Proposed Trade Regulation Rule on Food Advertising, Washington, DC. p.251).

Pseudonutrition as pseudomedicine.

The health food industry sells more than foods. Over-the-counter medicines constitute the greatest share of a nearly \$200 million herb and herbal tea market; plus, an additional \$33 million in herbal books designed to guide consumers in self-care (1). Nutrition-related forms dominate cancer quackery (2), and constitute a significant part of quackery for AIDS (3), Alzheimer's disease (4), arthritis (5), multiple sclerosis (6), mental retardation (7), and more. Such remedies are commonly promoted through publications protected by the First Amendment.

- Tyler The New Honest Herbal, Philadelphia: Stickley Co. 1987)
- Cassileth. "Contemporary unorthodox treatments in cancer medicine." Annals Intern Med. 2. 101:105-112, 1984).
- 3. Dwyer et al. "Unproven nutrition therapies fir AIDS What is the evidence?" Nutrition Today. Mar-Apr. 1988.
- Paros. "Can super blue green help save the world?" Nutr Forum, 5.17-19, 1988.

5 Arthritis: Diet & Nutrition Facts to Consider, Atlanta. The Arthritis Foundation

- 6.
- Therapeutic Claims in Multiple Scierosis, National Multiple Scierosis Society, 1982. "Megavitamins and mental retardation," American Academy of Pediatrics Pe American Academy of Pediatrics Policy Statement August, 1981

Practitioners of Nutritional Pseudomedicine.

A variety of practitioners traffic in nutritional pseudomedicine. Philosophically driven naturopaths, chiropractors, homeopaths, holistic MDs, RNs, DDSs, and others recommend and/or prescribe vitamin/mineral supplements, herbs, enzymes, glandulars, homeopathic remedies and health food products. Many pseudomedical practitioners have a symbiotic relationship with the health foods industry.

"Nutrition Consultants." Traditionally, the health food industry has relied upon clerks to promote its philosophy and wares. Although they are cleverly trained to avoid violating laws against practicing medicine without a license (1), health food clerks often provide questionable medical advice as they answer customer inquiries (2,3,4,5). More recently, practitioners called "nutrition consultants" has been created (these should not be confused with legitimate dietitians in private practice who engage in nutrition counseling). Pseudomedical nutrition consultants are characterized by their: (1) spurious credentials; (2) use of invalid methods of assessment; and, (3) dubious prescription practices. (6)

- 1. Fanning. Nutr Forum, 3:33-36, 1986.
- Kirkendall. JAMA, 239:2658, 1978. 2.
- 3. Stookey. ACSH News & Views, 4:1+, 1983.
- 4 Aigner. Nutr. Forum, 5:1-3, 1988.
- Motil. Columbus Monthly, 10:79-88, 1984. 5.
- 6. Jarvis. Nutr. & the MD, 11:1-2, December, 1985.

(1) Spurious Credentials. Diplomas (BS, MS, PhD) or certificates may be obtained from unaccredited correspondence institutions. The most prolific producer of spurious nutrition diplomas has been Donsbach University in Huntington Beach, California. In 1983 Donsbach University claimed to have over 3500 students enrolled, and gave more "PhD"s in nutrition than all of the recognized nutrition programs in the nation combined. Donsbach University was classified as an "authorized" institution under the laws of the State of California. Requirements for an such schools was \$50,000 in assets, which could be the property upon which such a school is located including the owner's home, and a listed "faculty," which can be non-resident. A brief history of its owner, Kurt W. Donsbach, is significant because he was trained in pseudonutrition by a dentist, Royal Lee. Donsbach states in promotional literature:

Dr. Donsbach. . . accepted a position with the world-famous Dr. Royal Lee of the Lee Foundation for Nutritional Research in Milwaukee, Wisconsin. After a long and personal relationship with Dr. Lee, he had the opportunity to help develop the Foundation's findings on National Malnutrition -- and its effects on health. (Donsbach University promotional brochure, circa 1981).

Royal Lee, was a graduate dentist who never practiced. He was a vitamin products

jobber and a manufacturer of engineering products (1). Lee was both a vociferous opponent of fluoridation and a promoter of pseudonutrition:

...Royal lee, who for many years has been one of the leading sources of nutritional quackery in this country, has pleaded no contest in a criminal action at Milwaukee and is awaiting sentence for distributing misbranded vitamin and proprietary remedies. He has also consented to an injunction which will stop further distribution of more than 115 products claimed to be good for some 500 different diseases and conditions. (1)

Donsbach lists himself as a "PhD," "DSc." "ND" and "DC." All of these degrees are from unaccredited schools (his Doctor of Chiropractic degree was obtained prior to the recognition by the U.S. Office of Education of an official accrediting agency for chiropractic training.) Most interesting is the fact that he apparently granted himself his own "PhD" in nutrition while briefly attached to unaccredited Union University in Los Angeles. Union University President, Robert Pfeiffer, has stated that the school has no record of having granted Donsbach a PhD (2). Further, Union University does not have a nutrition education program other than one operated by Donsbach himself for a short time prior to starting his own "Donsbach University." In 1978, Donsbach listed ten faculty members including three dentists: Ira Clary, DDS, Emanuel Cheraskin, MD, DMD, and John Vann, DDS (3).

[Note: The U.S. Office of Education defines a <u>diploma mill</u> as: "an organization that wards degrees without requiring its students to meet educational standards for such degrees established and traditionally followed by reputable institutions." (4)] 1974)]

Donsbach also created the International Academy of Nutritional Consultants which later merged with another proprietary certification agency, the American Association of Nutrition and Dietary Consultants, to form the American Association of Nutritional Consultants (5). The requirements of these agencies has been roughly the same: applicants must have: (1) a name so it can be inscribed in calligraphy on the attractive certificate; (2) an address to which the certificate will be sent; (3) fifty dollars, the price of the certificate. The motto for Donsbach's educational enterprises has been "health is wealth." In 1987, Donsbach sold his "university" to one of his "PhD" graduates who changed its name to the International University of Nutrition Education. Donsbach opened a clinic in Tijuana where he dispenses laetrile and other dubious remedies.

- 1. Milwaukee Journal, 3/24/53. (In <u>J_Amer_Dent_Assoc</u>, 71:1172-3, 1965.)
- 2. Los Angeles Times, July 15, 1982.
- Public Scrutiny, p.17, 2/1/78.
- 4. "Pollution in higher education," US Office of Education, March, 1974.
- 5. Barrett. Nutr Forum, 3:49-54, 1986.

(2) Invalid Methods of Health / Nutrition Assessment. Just as scientific medicine depends upon a variety of tests to aid in diagnosis and prescription, so too do pseudonutritionists. Such tests may be used in just about any manner the provider wishes. Tests used by pseudonutritionists to convince their clients that they need special supplements include the following:

Iridology. Reading the iris and interpreting lines, colors and irregularities based upon a chart showing organs superimposed on an illustrated iris is used as a method of diagnosis and prescription. Practitioners consult one of at least <u>nineteen different</u> <u>charts</u> to make their diagnoses (1). The inconsistency of these charts should be enough to discredit iridology as a rational procedure, but even more irrationality follows. Iridology employs a "no lose" rationale because if the client confirms that a problem exists in the-organ-in-question, a "hit" is claimed; however, if the client denies having a problem in that organ, the practitioner states that a "weakness" or propensity to disease exists there and is still able to claim that an accurate diagnosis has been made. Thus, iridology is a "no fail" system in the minds of believers. Several tests have disproved the value of iridology as a method of health assessment (2).

A Case report. A report of harm to a child based upon a diagnosis of "airway obstruction" by an iridologist who referred the client to a "nutritionist" who prescribed toxic doses of vitamin A reveals how pseudoscientific practitioners may combine to exploit consumers (3).

- 1. Stark. Med J Austral, 12/12/1981.
- 2. J Am Optometric Assoc, 55:735-9, 1984.
- 3. <u>N Eng J Med</u>, 294:805-8, 1976).

Live Cell Analysis. A drop of a client's blood is placed on a covered glass slide and placed under a dark-field microscope upon which a video camera has been mounted. Both client and practitioner view the blood cells which appear as dark bodies outlined in white on the video monitor. Practitioners make a wide variety of unjustifiable interpretations from what they see. For instance, the separation of red cells is said to be due to "impaired O2 delivery and CO2 removal caused by excess dietary fat." Non-round red cells are said to be caused by "toxins" entering the body. Lack of white cell movement is interpreted as "decreased immunity." Spicules "may signify liver or bowel toxicity," and so forth. In actuality. O2 and CO2 have nothing to do with the amount of separation of red cells. The shape of cells can occur with long-term alcohol abuse or sickle cell disease, but live cell proponents don't specify what "toxins" they are talking about. The movement of neutrophils on a slide is dependent upon the viscosity of the fluid in which they are found and not their immune function. Spicules are artifacts caused by drying or contamination of specimens. There are many more dubious interpretations that have been described as discredited by Lowell (1) Dark-field microscopy is a valid scientific tool for some uses, but live cell analysis as described above is not one of them.

1. Nutr Forum, 3:81-5, 1986.

<u>Blood Crystalization Test (HLDD Test</u>). A variation of the Livcell test is used by a Rosarita Beach (Mexico) cancer clinic. <u>Los Angeles Times</u> reporter John Hurst submitted cat and chicken blood (avian blood cells are distinctly oval-shaped and have no nuclei). These samples were not recognized as nonhuman. Diagnoses of "cancer" and "pre-cancerous" were made. Blood samples are not smeared or stained and are described as "just drops of clotted blood" (1).

1. LA Times, 10/22/87.

<u>Herbal Crystalization Analysis</u>. Advertised as a "breakthrough that takes the guesswork out of herbs" HCA involves placing a drop of saliva on a glass slide with a drop of copper chloride and allowing the sample to dry. The resultant smear is visually analyzed for "curative patterns" that may form. These patterns are said to be clues to possible cures. For instance, if two parallel lines form they can be interpreted as a blood vessel; garlic has beneficial effects upon blood (i.e., reduced blood pressure and platelet aggregation) so "garlic is worth trying when this pattern appears." Such reasoning is reminiscent of the medieval "Doctrine of Signatures." Upon investigation. the company offering HCA was unable to produce evidence that the method is valid.

<u>Reams Test.</u> Carey Reams was a self-proclaimed "biophysicist" who claimed to have discovered the "biological theory of ionization." He claimed to be able to "determine"

the degree to which patients deviated from the 'perfect health' profile, identify the type of ailment from which the patient suffered, and then create personalized diets and specific chiropractic procedures to restore body chemistry to the 'perfect level'." Ream's test allegedly could utilize almost any body component but relies mostly upon urine and saliva. Reams' prescriptions largely consisted of distilled water and lemon juice. Fasting, vegetarian diets, herbals and vitamin-mineral combinations are also employed. Sadly, a number of children have died following Ream's advice to discontinue insulin or rational cancer therapy (1)

1. American Cancer Society, NY, 1978.

Lingual Vitamin C Test. The lingual vitamin C test has become a common procedure in many dental offices. Its appeal lies in the fact it is quick, inexpensive and easy to perform. Reliability testing has failed to verify its usefulness (1,2)

1. J.Oral Med. 29:8, 1974;

2. Stults, J Oral Med, 42:229-232, 1987.

Pendulum Divining. Utilizing the same principles as those of water witching (1), diviners determine nutrient needs by requesting "yes" or "no" responses from a pendulum (a weight suspended on a 15-18" string). The amount of supplements alleged to be needed is determined by the length of the pendulum's swing. Although long associated with occult practices, the pendulum's action is no mystery. It is caused by "ideomotor action" which are subjectively unperceived, minute muscular actions. This explanation is acknowledged by sophisticated practitioners who claim that the device is a measure of their intuition which they esteem as more reliable than rational thinking. Diviners believe that human reason has been distorted. From a more practical perspective, the pendulum puts the practitioner in control of the situation in which opportunism based upon information supplied by the client will provide all that is needed to perform impressively for a client.

1. Hyman & Vogt. Water-witching USA, Chicago: U of Chicago Press, 1959

<u>Computer-Analyzed Questionnaires</u>. Impressive personalized printouts based upon computerized questionnaires transform what computer programmers dub the GIGO principle (i.e., "garbage in, garbage out") to "garbage in, <u>gospel out</u>" for clients. While there are valid computerized questionnaires available, there are several dubious programs in use by pseudonutritionists. One of the most widely used invalid computerized questionnaires is the 245-item instrument developed by "Donsbach University." When the New York Attorney General prosecuted one of its "graduates," experts found that no matter how the questions were answered the test reported several "nutrient deficiencies," and almost always recommended an identical list of vitamins, minerals and digestive enzymes (1). Questions on such tests are characteristically vague and weighted toward subjective, emotionally-significant attributes. Items also reinforce generally negative societal attitudes toward foods such as sugar, white flour, caffienated beverages, and so forth.

1. Nutr Forum, 4:65-8, 1987.

<u>The Yeast Test</u>. A simple fourteen-item questionnaire generally appearing in health food magazines asks if readers "feel tired most of the time" "suffer from intestinal gas...," "crave sugar, bread, beer...," "suffer mood swings..." and other symptoms suggestive of psychoneurosis. The cause is alleged to be systemic <u>Candida albicans</u> infection. A variety of food supplements are now on the market which have names derived from the terms "yeast" or "candida." Systemic candida infection does occur and is very serious, but there is no evidence of a relationship between the

psychological symptoms addressed by promoters and the real disorder. The American Academy of Allergy has issued a position statement discrediting the candidiasis hypersensitivity syndrome (1).

1 J Allergy Clin Immunol, 78.271-3, 1986

<u>Testing for Food Allergies</u>. Food allergy testing is one of the most abused areas within medical practice currently. Even among specialists there is disagreement on the basic definitions (1.2). Intolerances, idiosyncracies (3), side-effects of drugs (4), pharmacologic reactions, and psychological conditioning responses all can be confused with true immune-system-mediated allergic manifestations. Anxious patients may hyperventilate when confronted with a forbidden food (5). Appeals to restrict the term food allergy to immunological responses seem appropriate (6.7). Patients are not the only ones fooled by their personal feelings about different foods. Practitioners are vulnerable to experimenter bias as they interpret responses and clinical findings (8). All of these uncertainties are compounded by the use of unreliable methods of determining food allergies. These have been listed by the American Academy of Allergy (9). They include:

- (1) Cytotoxic Testing (Brian's Test);
- (2) Urine autoinjection;
- (3) Skin Titration (Rinkel Method);
- (4) Provocative and Neutralization Testing;
- (5) Provocative Testing (sublingual).

Of these, Cytotoxic Testing appears to be the most popular. Dental practitioners should avoid getting into allergy testing or associating with practitioners who utilize these questionable methods.

- 1. Edward. Lancet, p.326, Feb.7, 1981.
- 2. May. Nutr Today, 15:28-31, 1980.
- 3. Wilson. lancet, p. 450, Feb. 24, 1979.
- 4. Barnett. JAMA, 239:1394, 1978.
- 5. Lum. Lancet, p.516, Feb.27, 1982.
- 6. Finn and Cohen. Lancet, pp.426-8, Feb., 25, 1978.
- 7. Hemmings. Lancet, p.608, March 18, 1978.
- 8. Shapiro. in Bergman and Garfield, Handbook of Psychotherapy and Behavoir Change:
 - An Empirical Analysis, 12:439-473, New York: Wiley & Sons. 1971.
- 9. Reisman. J. Allergy Clin Immunol, 67:333-338, 1981.

Cytotoxic Test. The cytotoxic test involves mixing blood samples with dried food extracts and observing the effects upon white cells. If the cells collapse, disintegrate, or change shape, the patient is supposedly allergic to that food. The problem is that there is no relationship between the reactions of white cells to food substances and true allergies. The test has so many false positives and negatives that it is useless According to promoters, sufferers who may benefit from cytotoxic testing are (1). people who exhibit physical and psychological symptoms. These symptoms are indistinguishable from those claimed due to "reactive hypoglycemia," a popular misdiagnosis favored by pseudonutritionists. Such symptoms are characteristic of anxiety neurosis (2) leading to the theory that clinical successes are attributable to meeting clients' psychoneurotic needs. This phenomenon appears to hold true for a wide variety of doubtfully diagnosed conditions including alleged yeast infection, dental amalgam toxicity, and environmental sensitivity (3). Cytotoxic testing has no known medical value and its misrepresentations have been the target of regulatory action in Pennsylvania, California, and by the FDA.

A prominent dental figure, Emanuel Cheraskin has promoted cytotoxic testing to
Speaking as a member of the Advisory Board of Physician's Cyto chiropractors. Laboratories. Cheraskin states that the company measures the destructive reaction on white cells of more than 145 food substances (4).

- FDA Consumer, October, 1984.
- 2. JAMA, 243:1151-5, 1980.
- 3
- Canadian Fam Physician, 33:405-10, 1987. Digest of Chiropractic Economics, pp.789, May June, 1984. 4

Applied Kinesiology. The term "kinesiology" was appropriated from the academic world where it stands for the study of muscle-movement. The terms "Dental kinesiology," "Applied Kinesiology" and "Behavioral Kinesiology" have all been used. A-K has been used for the purpose of for "positive" and "negative" foods, determining the color to paint one's room, type of music to hear, how to walk, which teeth not to pull in orthodontic treatment, the fitting of oral splints to improve athletic performance, detecting cancer and more.

A-K involves placing various substances somewhere in contact with the body. IF subjects experience a "strong or weak" response, substances are judged to be "good Personal, subjective experiences are very impressive to clients, or bad" for them. especially when many regard themselves as skeptical at the outset. Many do not realize that superficial skepticism is not an adequate defense against deception, nor does it prevent suggestion or operant conditioning from working. Few appreciate the role of suggestibility in such responses. For instance, when a symbolically substance such as sugar, which is viewed negatively by about four out of five people (1), its not surprisingly that a negative effect on muscle strength is experienced. Friedman and Weisberg (2) found this to be true in a double-blind test, and were able to reverse the effect by telling dental students that they would experience strength because candy would give them "instant energy." Triano (3) and Kenney (4) found that A-K was invalid for making nutritional assessments.

The inventor of Applied Kinesiology is George Goodheart, a Michigan chiropractor, (5) who has worked out elaborate charts showing the alleged effects of specific nutrients and herbs upon specific organs, teeth, acupuncture meridians and muscles (6). These are extremely elaborate and raises a major question of just how so many complex, interrelationships could possibly be validated without an enormous research effort. When a major proponent of dental kinesiology was queried on this he stated that chiropractor Goodheart was "psychic" (7) and developed his charts by psychic means.

A near tragedy. In 1986, a Canadian orthodontist took her two children to a "clinical ecologist" for be tested for allergies. Irvine Korman, MD, tested the children by the a sublingual application of a solution followed by ten-minutes of observation during which no unusual behavior occurred. A second test employed A-K in which each child held a container against the chest while the opposite abducted arm was tested for strength. Dr. Korman determined that the children were not allergic to peanuts. When asked by the mother if she should give the children peanuts. Korman expressed his absolute confidence in the tests and assured her that they were not allergic to peanuts. The mother purchased some organically grown peanut butter and hesitantly gave each child a tiny amount on a piece of bread. "Both children collapsed. The girl was terribly white-faced, regained consciousness, was given Chlor-Tripolon. developed huge hives, but continued to breathe. The boy kept struggling, could not open his eyes, was gasping for breath, was blue and choking. An ambulance took the children to the hospital where the children were given adrenaline and within a few hours were fine ... " (8).

1. Maracom Research Corporation and Nutrition and Marketing Research Departments of General Mills, Inc. Dewline, changing consumer values and behavior related to food, Minneapolis, General Mills, Inc., 1980

J Prosth Dent, 45.321-3, 1981

2

- J Manipulative Physiolog Therapy, 5:179-82, 1982 3
- 4 J Amer Dietetic Assoc, 88:698-704, 1988
- 5. Evans. The American Chiropractor, 1979.
- Eversaul. Dental Kinesiology, Las Vegas. Eversaul, 1977. Jarvis and Kravitz. p.310. In Pollack and Kravitz. Nutrition in Oral Health & Disease. Philadelphia: Lea & Febiger, 1985
- Report of Proceedings, The College of Physicians and Surgeons of Ontario. Discipline 8. Committee, pp.9-10, February, 1989.

<u>Hair Analysis</u>. A lock of hair is clipped and sent to a laboratory for analysis. The client is presented with a printed analysis picturing his personal levels of specific nutrients within ranges of "very low" to "high." Specific recommendations on supplements are commonly made on the print-outs which may include the laboratory's own brand-name products. Hair analysis has no value as a means of nutritional assessment (1), and investigations have revealed suspicious results when test samples were sent to test for consistency standards (2). Valid uses of hair analysis include epidemiological applications for comparing heavy metal loads (e.g., lead, cadmium, mercury) between populations, and forensic medicine such as the detection of arsenic poisoning. Hair analysis labs were the target of fraud action by the Federal Trade Commission in 1984.

When the hair analysis promoters first began, they claimed to be able to make vitamin as well as trace mineral and toxic metal analyses. Since its more widely known that there are no vitamins in hair (3), they have retreated to nutritional trace minerals and toxic metals. Hair analysis is not valid for determining individual nutritional trace element levels or needs (3).

Some labs analyze only the toxic metals for which the procedure is more valid. However, even these laboratories misapply the data by recommending dietary supplements speculated to help the body handle the "toxic load." Prudent clinicians should be suspicious of efforts to prescribe and sell dietary supplements on the basis of hair analysis. Special nutritional supplements X-IT and Eater's Digest, marketed by anti-amalgam dentist Hal Huggins have been the target of action by the FDA which considers them "unapproved new drugs" (4).

- 1. Am J Clin Nutr, 36:943-9, 1982.
- 2. JAMA, 254:1041-5, 1985.
- 3. Hambidge. Am i Clin Nutr, 36:943-949, 1982.
- Consumer Reports, March, 1986. 4.

Alleged Amalgam Toxicity. Mercury toxicity is well-known within environmental and occupational medicine. It was among the earliest occupational hazards discovered as workers making beaver hats became contaminated and exhibited bizarre mental behavior. Cinnabar (mercury ore) miners are particularly prone to mercury poisoning an must be detoxified periodically. Dentists also are at risk of mercury poisoning if they handle mercury carelessly. Mercury is widespread in the natural environment. It is found in rocks of all classes, air everywhere, in plants and drinking water. The main source of body mercury is the natural background mercury in food (1). Dental amalgams add to the body load, and chewing releases ions, however, the differences between body loads of people with and without amalgams is insignificant; differences are more related to diet than number of amalgams (2). Dodes points out the inadequacies of the methods used by anti-amalgam dentists:

(1) Symptom guestionnaire. The questionnaire is overloaded with symptoms so inclusive that a completely healthy person would exhibit enough symptoms to satisfy an antiamalgamist.

- (2) Amalgameter. This device supposedly reads the "electric current" (positive vs negative) in each dental filling to determine which ones need to be removed first. Electrical readings of fillings do not measure corrosion rate as claimed.
- (3) Urine mercury and blood serum profiles. There is little correlation between urine mercury or blood serum profiles and body loads of individuals.
- (4) Skin patch test. There is no consistent relationship between contact sensitivity of skin and oral mucosa.
- (5) Hair analysis. Hair reliably reflects blood levels, but not body loads.
- (6) Mercury vapor analyzer. This device measures intermittent, not continuous mercury vapor output. The device was not designed to assess mercury in people's mouths but in the work place. Readings are multiplied by 8000 to estimate a full workday's exposure (3).
- 1. Clayton & Clayton, Patty's Industrial Hygiene and Toxicology, 3rd Edition, 1981.
- 2. Kroncke, et al. <u>Dtsch Zahnarzti. Z.</u>, 35: 803-808, 1980; Gonzales, et al. <u>Arch Environ</u> <u>Hith</u>, 40:225-228, 1985.
- 3. Operative Dentistry, 13:32-36, 1988.

Roy Kupsinel, MD. Kupsinel is an outspoken anti-amalgamist. He states that since mercury is a toxic metal that <u>any</u> (emphasis his) amount is toxic to the body (1). This ignores the fundamental principle of toxicology that the <u>dose makes the poison</u>; the fact that mercury is ubiquitous in the environment: and the scientific data on mercury and human health. Kupsinel is a fellow of the Price-Pottenger Foundation and founder of the American Quack Association (AQA). The AQA is made up of mavericks who hold an annual meeting across the street from the headquarters of the AMA, and declare themselves to be quacks. They define "quack" as "quality care with kindness," however, many of their leaders have been in legal difficulty related to their practices.

Antiamalgamists claim to have relieved the sufferings of patients with mysterious, undiagnosed conditions, and degenerative conditions such as multiple sclerosis (MS). Anecdotal reports are not convincing because psychoneurotic disorders can appear to be mysterious to practitioners untrained in diagnosing such conditions, and often respond to placebo treatment. MS, and other degenerative conditions have natural histories of remissions and exacerbations making it easy for unqualified clinicians to misjudge improvements. There is no reason to believe that clinical successes are due to anything more that the pitfalls of empiricism discussed in Part One of this series. Anecdotal reports of clinical successes can be matched with failures of dental amalgam removal to relieve symptoms. Only controlled studies can resolve disputes about the validity of antiamalgamist claims.

1. "Mercury/Amalgam Toxicity," Kup's Komments, 4:3-15, 1983.

Enhancing the Testing Procedures.

The persuasiveness of an invalid health assessment modality is often enhanced by the "style" of the practitioner. Self-confidence is probably the most important single factor in creating the illusion that the diagnosis is legitimate. Clients are vulnerable to the so-called "P.T. Barnum Effect" (1). which is that the more someone believes that a diagnostics test is tailored for them, the more they will fit its generalizations to themselves specifically.

1. Psychology Today, March, 1975.

(3) Inappropriate Prescription Practices. The inappropriate prescription practices commonly employed by pseudonutritionists include:

- (1) An overemphasis upon supplementation.
- (2) Excessive costs. Victims may pay \$150-300 monthly for supplements.
- (3) Direct sales to clients. An obvious conflict of interest is involved when a practitioner profits directly from selling prescriptions to a patient. Such practice is very likely to impair clinical objectivity. Not only is this of doubtful ethics, in some states it is illegal.
- (4) Kickback arrangements. Many entrepreneurial laboratories encourage practitioners to enter into kickback arrangements with them. This is merely a camouflaged version of direct sales to patients.
- (5) Unconventional site to fill prescriptions. Suspicion is warranted when practitioners send patients to health food stores or herb shops to have prescriptions filled. The products dispensed by such outlets do not undergo the scrutiny and controls of regular pharmaceuticals. Kickbacks or hidden ownership by practitioners is a very real possibility in such cases.

Multilevel Marketing through the Dental Office.

Another way dubious nutrition infiltrates dental practices is through the selling of various nutrition products by way of multilevel marketing schemes. Included are formula weight-loss products, vitamin and mineral supplements, herbs, imitation milk products, etc. A serious ethical question arises when a member of a health profession uses his/her influence to sell commercial products. Especially nondental products which are sold by the use of nutrition misinformation. Misconceptions regarding "soil depletion," "modern food processing," "widespread subclinical vitamin and mineral deficiencies" the superiority of "natural" vitamins, and so forth are used to persuade people to buy the products. The motivations to sell the products -- and sign up others to work under them -- is to fulfill the classic American sweet dream of financial success and has nothing recognizable to do with delivering scientifically-based health care to suffering humanity. Such commercialism can only contribute to a decline of professionalism and waning public confidence.

Proponents of Dental Pseudonutrition.

"Balancing Body Chemistry."

[Nutrition is the science of balancing body chemistry and providing the body with the proper levels of fats, carbohydrates, and proteins, so that all the cells of the body are capable of performing all their required functions for the health of the entire body. With proper nutrition and health maintenance, the body can both function at its peak energy level and resist the diseases and stresses of everyday life.] (Discipline Directory for Holistic Practitioners).

The phrase "balancing body chemistry" appears to have become synonymous with dental pseudonutrition. It appears that during the period when much was being learned about nutrition and hard tissue physiology, balancing body chemistry had reference to the calcium-phosphorus balance (which the body achieves automatically if provided with sufficient amounts of each and is not excessive in phosphorus). The phrase since has become vague and appears to mean whatever pseudonutritionists want it to at their convenience. Tracing the phrase historically reveals the evolution of dental pseudonutrition.

Weston Price, DDS. Weston Price, DDS, was a primary figure in the history of dental pseudonutrition. Price expressed his views in a book, <u>Nutrition and Physical Degeneration</u> (1). Price stated that tooth decay was a "tragic expression of our modern degeneration" including "general physical degeneration, and facial and dental

Degeneration (1). Price stated that tooth decay was a "tragic expression of our modern degeneration" including "general physical degeneration, and facial and dental arch deformities, and character changes." He referred to these as expressions of "race decay." Price blamed such problems on factors related to the modern diet including soil depletion, white flour, sugar and pasteurized milk. Price is also used as an authority by proponents of an alleged link between diet and criminal behavior (2). Price taught that nutrition was the key to the development of the human forebrain which elevated man above bestial behavior. Price apparently was an adherent to eugenics -- a concept which dominated much intellectual thought early in the twentieth century. The foreword of Price's book was written by Harvard anthropologist Earnest Hooton. According to Pickens:

Hooton. . . endorsed the theme of degeneration, that urban dangers existed for racial America. The origin of this sentiment was in their acceptance of the theory of inheritance of acquired characteristics. . . Philosophers accepted this degenerative process, along with the noble-savage concept. . .

Hooton, like others of his era, accepted notions about craniology and physiogamy. These taught that the shape of the face and skull was indicative of racial hierarchy. Even criminal behavior was largely due to an acquired genetic inferiority. These ideas were presented in Price's book along with his theories about the mechanisms of degeneration.

Price believed that nutrition was the significant factor in racial deterioration. He stated that tooth decay was a "tragic expression of our modern degeneration" which included "general physical degeneration, and facial and dental arch deformities, and character changes." He referred to these as expressions of "race decay." Price blamed such problems on factors related to the modern diet including soil depletion, white flour, sugar and pasteurized milk.

Utilizing what he stated were journalistic techniques, Price set out on a tour of the world taking pictures of natives bearing their teeth, counting cavities (undefined) and jumping to enormous conclusions. Using a travelogue style he extolled the health of primitives in everything they did from their methods of childbearing to food habits. Nowhere in his book is there to be found a single negative reference to any feature of these primitives' lifestyle or health status. Some of his pictures reveal his bias by showing African children with bloated stomachs representative of malnutrition. Despite his attention to the mouths of people, he never mentions periodontal disease which is known to be extensive among primitives (3).

Price's biases are further revealed by the way he interpreted his observations. When counting cavities among the Eskimos he noted that a group who had lived partly on native foods and partly on "store grub" had 12.2 cavities which he blamed on the store food. In the case of another woman who had no dental caries but also had a mixed diet, the primitive diet was credited with a protective affect upon her. He repeats this subjective reporting on dietary habits in which native foods are ascribed positive values and civilized foods negative effects when observing students in an Indian school in Brantford, Ontario he noted that the dental caries the children had "apparently" occurred before coming to the school and that no active caries were present which he owed to their "excellent nutrition" which "limited the sugar and white flour. "Price's lack of quantification, definition and objectivity make his work scientifically uninterpretable. His tirades against modern foods and free-running commentary on every subject including farming, animal husbandry, anthropology, criminal behavior, and many more, exhibit the marks of pseudoscience.

been when contacted by civilization. This fact is well known. The question is what are the true factors involved in this phenomenon? Price's biases prevented him. not only from seeing negative features of primitive living, but from even suggesting some other factors might be operating besides the presence of white flour, sugar, and pasteurized milk. Among the factors Price failed to consider were (1) the effects of malnutrition on caries, (2) genetic effects, and (3) dietary abuses.

(1) Malnutrition and dental caries. Dental researchers have repeatedly observed that caries do not occur very frequently in malnourished people (4). Cady (5), and Messler and Schour (6) reported that studies of malnourished children in Europe revealed a much lower rate of dental decay than was found among children in the United States who appeared to be well-nourished. Marshall-Day (7) found a similar low rate for caries in a famine area of India where nearly seventy-five percent of the twelve-year-old children were free of cavities. This situation is in marked contrast to that in Rochester, New York, where less than one percent of the children were found to be free of cavities. Marshall-Day concluded, from his general findings, that teeth do not share in the general bodily deterioration which accompanies dietary eficiencies.

(2) Genetics and rampant caries. Genetics also appears to play a role in the increase of caries among aboriginal people. Poole, et al (8) studied the apparently exaggerated response of Aleuts to dental disease compared to Greenland Eskimos. Using genetic indicators of a influx of caucasian genes such as the appearance of the cusp of Carabelli, these researchers found that increased heterogeneity was also an important etiological factor.

(3) Dietary Abuses. Although his treatise was on nutrition and physical degeneration, Price did not quantitatively assess the diets of his subjects. Had he done so he may have discovered, as others have, that the dietary habits of primitives appear to be an abuse of the civilized diet rather than something representative of a recommended modern diet. It would appear that a major adaptation problem of primitive people in their encounter with modern civilization is their apparent unwillingness to discipline their desires. In the case of the Eskimos cited earlier, dietitian Andree Beaulieu says that Eskimos and Canadian Indians are "hooked on sweets". She and her study group were "stunned by the quantities of hard candies, chocolate bars, sweet cookies and chewing gum that they bought at the local store." She laments, "Before the white man came they had never tasted sweets. Now, it seems they crave little else. Candy is the favorite food of the north" (9). Primitives seem to lack self-discipline when given access to items which tantalize their sensory responses. Perhaps, this is because the disciplined aspects of life under primitive conditions were previously imposed by The type of local plant and animal life determined his food and circumstances. shelter, and the weather dictated where and when he hunted and gathered. It was Thus, dominated by external "feast or famine" depending upon nature's whims. controls, his internal controls had no chance to develop. Such controls are essential when constantly confronted with items which can easily be overindulged.

- 1. Price. Nutrition and Physical Degeneration, Santa Monica: The Price-Pottenger Foundation, 1945.
- 2. Eugenics and the Progressives, Nashville: Vanderbilt Univ Press, 1968)
- 3. Russell. "Epidemiology of dental caries and periodontal disease. In Young & Striffler,
- The Dentist, His Practice, and His Community, pp.73-86, Phila.: WB Saunders Co., 1969. 4. Easlick. Dental Caries Mechanisms and Present Control Techniques, St. Louis: CV Mosby
- Co. pp.59-60, 1948.
- 5. Cady. Oral Hygiene, 36:246-9, 1946.
- 6. Massler & Schour. J Dent Children, 14:6-11, 1947.
- 7. Marshall-Day. Brit Dent J, 76:115-122, 1944.
- 8. Poole, et al. J. Dental Res: Special Issue C, 56:C79-C89, 1977.
- 9. Beaulieu. Nutr Today, 9:33, 1974.

Francis Pottenger, MD. Weston Price's book has been republished and is promoted by the Price-Pottenger Foundation. The second half of the organization's name is named for Frances M. Pottenger, MD. Pottenger's fame is based upon several published articles he generated from a quasi-scientific study purporting to demonstrate that cats fed cooked meat and milk suffered from lowered fertility, impaired growth, and increased birth defects. He claimed that their deterioration was so dramatic that it included "germ plasm injury" causing them to pass acquired anatomical defects along to their off-spring (1). His study is used by promoters of certified raw milk to discredit pasteurization. Wilson provides extensive evidence that pasteurization does not have adverse effects upon fertility, growth and development or birth defects (2). Pottenger's claim that cooking meat made it unhealthful for cats is contradicted by the fact that all commercial cat foods are cooked. An expert in pet food nutrition states that unless the meat was "hard cooked" its proteins wouldn't be sufficiently destabilized to create the problems described by Pottenger (3). It is also interesting that Pottenger gave credit to the Lee Foundation for Nutritional Research for "valuable assistance" at the end of his article.

- 1. Pottenger. Am. J. Ortho. Surg, 32:467-485, 1946.
- 2. Wilson. The Pasteurization of Milk, London: Butler & Tanner, Ltd, 1942.
- 3. Jarvis and Kravitz, p.295. In Pollack and Kravitz, <u>Nutrition in Oral Health & Disease</u>, Philadelphia: Lea & Febiger, 1985.

Granville Knight, MD. Granville Knight, MD, an prominent antifluoridationist, was President of the Price-Pottenger Foundation for several years. Knight was President of the American Academy of Nutrition two decades ago when it was reported that the organization believed "that malnutrition in this country is widespread and that it is the result of the following faulty conditions or practices:

- (1) Use of pasteurized rather than raw milk.
- (2) Use of non-fertile rather than fertile eggs.
- (3) Ingestion of mixed meals.
- (4) Use of canned fruits and vegetables.
- (5) Use of white flour rather than freshly milled whole grains or sprouted grains.
- (6) Use of refined sugars.
- (7) Use of plant foods of all types grown on impoverished soils.
- (8) Use of chemically pure or synthetic vitamins.
- (9) Use of chemically-contaminated foodstuffs resulting from pesticides, etc. (addition of fluorides to water supplies is opposed)." (1)

These ideas reflect the "vitalistic" doctrine which holds that natural things possessed some special quality that elude foods tampered with by man.

1. American Dental Association. "Comments on the opponents of fluoridation," <u>J Amer Dent</u> Assoc, 71:1155-1183, 1970.

Melvin Page, DDS. Melvin Page, DDS, coined the phrase "balancing body chemistry." Page states that "dental caries (is an) outstanding example of systemic chemical imbalances" (1). Page was listed for a time among the proponent of unproven methods of cancer management by the American Cancer Society. As recently as 1972 his writings were still featured in the literature of organizations advancing unproven remedies (2). At that time he was still giving credit to Weston Price, DDS as the inspiration for his work.

Page's book, <u>Degeneration-Regeneration</u> promotes his Weston Price-inspired theories and teaches that "there is but one disease; inefficient body chemistry." Page has taught "balancing body chemistry" to many other dentists who have in turn spread the message to others. Hal Huggins is one of Page's students who has promoted the idea of "balancing body chemistry" through dietary practices. Huggins attacks pasteurized milk (3), says that sugar is addicting, recommending honey as a substitute during "withdrawal," and describes white flour as a "negative food." Huggins also describes soil depletion. The Hal Huggins diet, which appears to be the one originated by Page, has been censured by the American Dental Council on Dental Research (4).

Page ran afoul of the law due to his marketing of a product he called "Ce-Kelp" through his Dental Research Company. In an Federal Trade Commission (FTC) complaint Page was charged with "unfair and deceptive" acts based upon his claims that Kelp would supply minerals missing from modern diets due to rain fall having washed them from the soil. Deficiency diseases, he said are caused by "the failure of the ductless glands to function properly due to the lack of the mineral elements so essential to them." Among the "deficiency diseases" he listed were: "Goiter, heart trouble, tuberculosis, diabetes, anemia, high and low blood pressure, hardening of the arteries, rheumatism, neuritis, arthritis, kidney and bladder trouble, frequent colds, nervousness, constipation, acidosis, pyorrhea, over and underweight, cataract, cancer. etc." Page claimed that "science had not yet discovered a way in which inorganic substances may be prepared so that the body can assimilate them." He said that in the inorganic form the minerals acted only as "stimulants." "Blood balance" was needed to correct these deficiencies and Ce-Kelp would do the job by restoring the "impoverished glands and supplying the necessary salts. Page also was censured for referring to himself as "Dr. Page," hiding the fact that he was a dentist, not a physician. The FTC statement declared"...neither is he [Page] a recognized "authority" on dietetics or any other medical subject." Page was ordered to desist from representing himself as anything other than a dentist, or as a "one of the leading authorities" or as a recognized authority at all on calcium-phosphorus blood studies (5).

- 1. Page. <u>Body Chemistry in Health & Disease</u>, St. Petersburg, FL: Page Foundation, p.112, (undated).
- 2. Page. "Body chemistry and cancer," Cancer News J, 7:28, 1972.
- 3. Huggins. <u>Body Chemistry</u>, Chapter 1, reprinted from <u>Atlas of Occlusal Analysis</u>, editor, AG Lauritzen (undated).
- 4. American Dental Association. Reports on Councils and Bureaus, 1975. Position Statements for the Council on Dental Research, <u>J Amer Dent Assoc</u>, 91:1253-4,
- 5. Davis. Federal Trade Commission File No. 1-13513, 1940.

Emanuel Cheraskin, MD, DMD. Another principal figure in dental pseudonutrition is Emanuel Cheraskin, MD, DMD. He also widely expounds exaggerated beliefs in the value of nutrition in health and disease. Cheraskin is the leading author of several books on the value of nutrition as therapy. Many of these build upon scientifically accepted practices from the vast field of therapeutic dietetics, but carry them beyond their limitations. There's no direct evidence linking Cheraskin to Weston Price, but his belief in diet's role in abnormal behavior (1), his emphasis upon systemic factors in dental disease and the content of his work clearly place him in harmony with Price philosophically.

Cheraskin advances his beliefs in a fashion more like contemporary fringe practitioners. He associates aberrant behavior with "hypoglycemia" challenging the specialists in endocrinology (2). Cheraskin also promotes "orthomolecular psychiatry" in opposition to a scientifically-based position statement disclaiming its value issued by the American Psychiatric Association (3). Cheraskin apparently places himself above the entire medical establishment, and goes out of his way to make conventional medical and dental practitioners look bad, not by accurately pointing out actual shortcomings, but by ambiguously misrepresenting what is believed. For example, he says:

"<u>Traditional</u> (emphasis mine) medicine assumes that scurvy, for example, is the first and earliest evidence of a vitamin C deficiency state. The fact of the matter is that scurvy is the terminal state of avitaminosis" (4).

Compare this with what Williams' says about the value of vitamin C, and you will see that Cheraskin's assessment of 'traditional medicine' is unfounded:

"The significant role of vitamin C in cementing the ground substance of supportive tissue makes it an important agent in wound healing. This has evident implications for vitamin C therapy in surgery, especially where extensive tissue regeneration is involved. For example, during the acute stage, a patient who has undergone mastectomy or a severe burn may need from 1 to 2 gm. daily of vitamin C, which is ten times or more the usual daily allowance.

Infectious processes deplete tissue stores of vitamin C and necessitate additional intake. Apparently this is especially true of infection with bacteria. Optimum tissue stores of vitamin C help maintain resistance to infection. Any body stress --injury, fracture, general illness, shock-- calls on vitamin C tissue stores. This seems indicated by the large concentration of the vitamin in adrenal tissue.

Additional vitamin C is needed during growth period (infancy and childhood) and during pregnancy to supply demands for fetal growth and maternal tissues (5).

Cheraskin also implies that medical scientists use fuzzy thinking as they look for cause effect relationships by saying:

In <u>traditional</u> (emphasis mine) circles, if B follows A, then A is held to be the cause and B the effect. The possible illogic of this type of thinking can be readily demonstrated. For example, if a brain-tumor patient with a headache is given a shot of morphine and his headache vanishes for a period of time, may one assume that the subject has a morphine deficiency? (4)

What Cheraskin describes is the fallacious principle of <u>Post hoc ergo propter hoc</u> ("after it therefore because of it"), a type of reasoning associated with quackery, not science. In addition, Cheraskin's use of the term "traditional" is ambiguous. On the surface it seems to be referring to standard medical science when it clearly is not doing so. When queried on this, Cheraskin stated that he was referring to the "average dentist's office" (6). That is quite different from "traditional medicine" and should have been referred to as such. Cheraskin's use of this term indicates a "straw man" type of strategy where he creates an illusion of the enemy which really doesn't exist, and then destroys it.

Cheraskin also advances his unique view of multifactorial disease etiology which he calls his "susceptibility-resistance principle." He says:

what is loosely designated as host state actually represents a constellation of factors which invites or discourages one's ability to cope with the environment. These factors may be viewed as resistance and susceptibility agents. By definition, a resistance agent is one which, when

administered, tends to discourage cardiovascular pathosis. On the other hand, a susceptibility agent is one which, when introduced tends to invite disease. The obvious susceptibility factor is refined carbohydrate foodstuff because it encourages the development of dental caries. Thus, host state consists of a series of resistance factors (which may be viewed as pluses) versus susceptibility factors (which may be expressed as minuses). In simple terms, healthy people possess many pluses few minuses; sick people display more minuses than pluses. Common sense would dictate that the elimination of susceptibility factors and the addition of more resistance variables would shift the subject to greater and better health. Clearly, certain dietary and nondietary elements have been Vitamin C discourages scurvy, physical activity identified as pluses. encourages cardiovascular fitness, and so on. On the other hand, certain dietary and nondietary variables tend to invite disease and thus must be viewed as minuses. Refined carbohydrate foodstuffs invite dental caries, tobacco encourages lung cancer, and so forth. Perhaps what is most exciting about this concept is that a susceptibility agent in part of the body does not convert to a resistance factor in another area. Thus, refined carbohydrate foods are deleterious to the teeth. They are also harmful in diabetes mellitus, acne, obesity, and a host of other well-established syndromes (4).

Cheraskin's "susceptibility-resistance principle" exhibits reasoning much like that of Weston Price as he attempts to prove refined carbohydrates are bad for the whole body because of their effects on teeth by way of this resistance-susceptibility principle. The fundamental error of Cheraskin's resistance-susceptibility principle is revealed by the fact that many instances exist where the same factor exhibits both positive and negative effects, for example:

- (1) Sickle cell disease, a serious malady in itself, is nonetheless a protective mechanism from malaria (7,8).
- (2) Post-operative empyema, a bacterial infection, following thoracotomy for lung cancer significantly improves long-term survival rate (9).
- 3) Antibiotics, which have demonstrated such usefulness in fighting infections, also suppress favorable micro-organisms in the system.
- 4) Sugar is an excellent fuel for Marathon runners, but similar amounts for a sedentary person is apt to be excessive calories.
- 5) A basic principle in pharmacology is that increasing the dosage of a therapeutic compound leads to maximum effectiveness, and on further increase leads to the production of toxic effects.

Cheraskin underwrites the common themes of food faddism in a so-called "garden to gullet" argument in his book, <u>New Hope for Incurable Diseases</u>. Cheraskin states that "soil quality may contribute in some small way to the inadequacy of the American Diet", and "The evidence is clear that transportation and storage of food always leads to a reduction in nutrients". These are true statements and well-known to nutritionists, but what follows these statements is what makes them erroneous ...that being the contention that even the consumption of an optimal diet is insufficient in providing adequate nutrition necessitating supplementation (10).

Cheraskin has a ready retort for all who criticize his work. He cites an old proverb about a committee arguing about how many teeth elephants have until one man finally takes the trouble to count them. Cheraskin says that he has counted the elephant's teeth, implying that no one else has (11,12). Cheraskin's rebuttal fails on the main point; it is his methods of observation (i.e., counting the "elephant's teeth") that his critics have found inadequate. Stepnick evaluated 26 major articles by Cheraskin, et al, on the relationship between diet and periodontal disease. The deficiencies in design elaborated by Stepnick included:

- (1) A failure to evaluate oral hygiene plaque status in an adequate and acceptable fashion;
- (2) Using improper subjects (80% of all subjects were apparently healthy and under 30 years of age);
- (3) Limitations imposed by the number and location of the teeth studied;
- (4) The use of questionable criteria to evaluate gingival state;
- (5) Using time periods that were too short; and,
- (6) Questions about the reliability and validity of sulcus depth measurements because they were indicative of normal, healthy subjects and the variability of the measurements were within margins of error to be expected upon repeated probing (13).
- 1. Cheraskin, et al. Psychodietetics, New York: Stein & Day Publ, 1974.
- 2. American Diabetes Association. Statement on hypoglycemia. Diabetes Care. 5:72-3. 1982.
- 3. American Psychiatric Association. Nutr Reviews, 32 Special Suppl:44:7, 1974.
- 4. Cheraskin. "The diet dilemma in dentistry," J Amer Soc Prev Dent, 4:25-32, 1974.
- 5. Williams. Nutrition and Diet Therapy, St. Louis: CV Mosby Co., p.112, 1969.
- Cheraskin, Personal communication during workshop on Diet, Nutrition and Periodontal Disease sponsored by the American Society for Preventive Dentistry in Sun Valley, ID, 1974.
- 7. Pavlov, et al. Nature, 274:701, 1978.
- Allison. <u>Brit Med J</u>, 1:290, 1954.
- 9. Terry. <u>CA</u>, 25:198, 1975.
- 10. Cheraskin. New Hope for Incurable Diseases, New York: Arco Publ. Co. pp.25-28, 1971.
- Hazen. <u>Diet. Nutrition & Periodontal Disease</u>, Chicago: American Society for Preventive Dentistry, p.178, 1975.
- 12. Mittleman. "Cheraskin Answers Stepnick," The Once Daily, 63:1, 1975.
- 13. Stepnick. J Amer Soc Prev Dent, 5:16-22, 1975.

Nutrition Fallacies

Pseudonutrition thrives upon misinformation and misbeliefs common to food faddism. These begin with agriculture-related misperceptions and extend through all of the many fields covered by the multi-disciplinary science of nutrition.

Agriculture-Related.

Claim: Soil depletion (from "farmed out" or washed out" soil) produces nutritionally deficient food crops.

Fact:: Plants are "autotrophic" meaning they can provide all of their genetically programmed needs (i.e., the production of vitamins, proteins, fats and carbohydrates etc.) when provided with the basic inorganic raw materials needed. All plants must have all sixteen of these elements:

carbon	phosphorus	magnesium	molybdenum
hydrogen	potassium	iron	manganese
oxygen	sulfur	zinc	copper
nitrogen	calcium	boron	chlorine

Carbon, hydrogen and oxygen are supplied by water and air. Primary nutrients: Nitrogen, phosphorus and potassium are supplied by fertilizers. Secondary nutrients: Calcium, magnesium and sulfur are added as needed. Micronutrients: boron, iron, chlorine, copper, manganese, molybdenum, and zinc are mineral elements that come directly from minute rock particles (dirt) in the form of ions which have been released by the action of water, soil bacteria, etc. If any of the necessary components are missing, plants are unable to complete their life cycles (1) adversely affecting crop yields. Seasonal factors of temperature, sunlight and water supply also are of significance. In food production good yields equal good nutrition.

1. Cooperative Extension Service, The Ohio State University (undated).

Claim: Plants are picked too soon, lowering their nutritional value.

Fact: The stage of maturity at which a plant is picked does have an effect upon its nutritional value. There's no doubt that fruits and some "vegetables" (likely also to actually be fruits--such as tomatoes) taste better if ripened on the plant. This is generally because they have converted more of their starches to sugars. However, sometimes custom dictates that we prefer plants in their premature state. Bell peppers are preferred by most when green even though if permitted to mature (turn red) their nutrient levels increase dramatically. They are also very nutritious when green. No one has ever suffered from nutrition deficiencies because they were forced to eat otherwise wholesome plant foods in their premature state. People are better off today than in the past because fresh fruits and vegetables (even though not fully ripened) are available on a year around basis while in the past these were strictly seasonal.

Claim. Pesticide residues are slowly poisoning us.

Fact: Pesticides are necessary for successful crop-raising in a world dominated by insects. They are applied in such a manner (at certain times of development, many of which precede the appearance of the edible portions of plants), as to pose no problems for consumers. Pesticides are organic compounds which break down chemically to harmless by-products. This is especially true due to recent emphasis which has been placed upon environmental quality. Even DDT never posed any human hazards (1,2) but its effect upon calcium metabolism in birds (affecting their eggshells) brought a ban. This action was taken without full evidence that DDT was responsible, but the tendency of government regulators is to err on the side of conservatism (3). Most interesting have been the studies which have compared the minute pesticide residues present on so-called "organically grown" with conventional

foods. Both kinds have residues, and interestingly, the "health foods" have often shown more contamination (4,5).

- Jukes. Arch Intern Med, 138:772-4, 1978.
- 2. Jukes The Amer Biology Teacher, 38.162-7, 1976
- 3. Varela, et al. World Rev Nutr Diet, 30 148-188, 1978.
- 4 Appledorf, et al. J Milk Technol, 36.242-44, 1973.
- 5. Jukes. Med Times, 103:75-81, 1975.

Claim: Organically grown foods are superior to conventional foods.

Fact: In a thorough review of this question that included input from every dimension of the food industry, the Federal Trade Commission stated: "...the record conclusively establishes that neither "natural" nor "organic" foods are inherently superior, in terms of nutrient content or safety, to ordinary foods. Insofar as 'organic' foods are concerned, no such differences between these foods and their commercial counterparts has ever been shown. Indeed, its impossible to tell an 'organic' food from a commercially grown food after they have been grown (1).

1. Proposed Trade Regulation Rule on Food Advertising: Staff Report & Recommendations, Washington, DC: Federal Trade Commission, p.267, 1978.

Claim: Fertilized eggs are superior to infertile eggs.

Fact: No scientific proof exists that fertile eggs are more nutritious or differ in any substantial way from in nonfertile eggs ...with the exception of a microscopic amount of nutrition provided by the rooster's sperm. Fertile eggs do not keep as well as nonfertile and are more expensive to produce (1).

1. Stadelman & Cotterill. Egg Science and Technology, Westport, CT: Avi Publ Co., 1973.

Claim: Colored eggs are more nutritious and contain less cholesterol than white eggs. Fact: The color of shells is directly related to the breed of hens and has no effect on the nutrient composition of the eggs; also, darker colored yolks are no more nutritious, the coloring agent is a non-nutritive substance (1). Blue Araucana eggs have been touted as being lower in cholesterol than ordinary eggs. A study which tested this claim found that the araucana eggs actually were significantly higher in cholesterol (2).

- 1. Stadelman & Cotterill. Egg Science and Technology, Westport, CT: Avi Publ Co., pp.106-7, 1973.
- 2. Peterson, et al. J Amer Diet Assoc, 72:45-47, 1978.

Claim: Feeding DES to cattle poses a health risk to humans consuming the meat of these animals.

Fact: DES has never been shown to be harmful to anyone as an animal feed supplement. DES was used for a time as a drug intended to protect women from miscarriage. Scientific studies eventually proved it ineffective for that purpose resulting in discontinuation of the practice (1). A small case-control study reported in 1971 (2) indicated that the DES pill had caused vaginal cancer in the daughters of the women using it. This has caused nationwide news as the so-called "DES-daughters" were hunted down and examined. The project determined that the original findings suggesting a high risk for DES daughters have not held up, and the risk is now described as "very low" (3).

The effects of the DES pill for miscarriage has no real bearing upon its use as a feed supplement for cattle. Although only a small fraction of animals (52 of 8293 samples 1973-1975) (4) show any residue at all. A woman would have to eat 61 1/2 tons of the contaminated liver to match the dose of the pill (5). This illustrates the

conservativeness of U.S. Food Safety laws. Whether or not they should be so restrictive is a matter for debate. It is obvious that food faddists exploit the fears generated by media coverage of issues like feeding DES to cattle capitalizing upon the lack of confidence engendered in the public.

- 1. Brackbill & Berendes. The Lancet, p.520, 9/2/78.
- 2. Herbst. et al. New Engl J Med, 284.878-881, 1971.
- 3 Elliott. JAMA, 241:1555, 1979.
- 4. Jukes. Feedstuffs 49, 48:22-23, 1977.
- 5. Stare & Whelan. Panic in the Pantry, New York: Athenum, p.167, 1976.

Food Processing: Additives.

Claim: Degenerative diseases have increased since the use of food additives.

Fact: Mankind has used food additives for thousands of years. Among the oldest is common salt. Its also one of the few which has been associated with a disease--it helps produce high blood pressure in genetically susceptible individuals (1.2). Increases in degenerative diseases are a result of having eliminated diseases which kill people prematurely. Record longevity at every age-level (3) is the gift modern health science has produced. Epidemiologists have reported that food additives have probably been a positive effect in public health rather than a health hazard (4).

- 1. Morgan. Amer Heart j, 97:811-12, 1979.
- 2. Pietinen, et al. Amer J Clin Nutr, 32:997-1005, 1979.
- 3. Statistical Bulletin, Metropolitan Life Insurance Co., 69:10-15, 1988.
- 4. Jansen. World Rev Nutr Diet, 39:18, 1982.

Claim: Food colorings cause hyperactivity in children.

Fact: This claim is based upon a book by the late allergist Benjamin Feingold, M.D. who theorized a situation similar to aspirin intolerance. While no study has verified Feingold's original claims, some have found a small number (i.e., five percent or below) which do respond under double-blind conditions to certain food dyes. The most comprehensive effort to resolve the question was undertaken by the Nutrition Foundation. In their conclusions they stated:

Based on seven studies involving a total of approximately 190 children, there have been no instances of consistent, dramatic deterioration in behavior in hyperactive children challenged under double-blind conditions, with artificial food colorings following treatment with the diet that removes these substances. There are three instances which constitute exceptions to these generally negative conclusions, but, in all three cases, the deterioration is reported only by the mother with no other objective, confirming evidence available. . .these negative findings stand in sharp contrast to the 32-60 percent . . .reported by Dr. Feingold . . . (National Advisory Committee on Hyperkinesis and Food Additives, Washington, DC: The Nutrition Foundation, 1980).

Claim: Aluminum cookware adds contaminants to food causing health problems. Fact: The claim that cooking foods in aluminum pots is unhealthful has been traced to 1925-1935 when manufacturers of iron cooking pots attempted to maintain their economic status by frightening consumers (1). Cooking in aluminum pots does add some aluminum to foods--especially acid-foods (2), however, the amount is small and insignificant to anyone except, possibly, someone who's body levels of aluminum are high due to dialysis or use of stomach antacids. It may be of interest to note that aluminum cookware decreases the fluoride content of food somewhat due to the affinity of aluminum to fluoride (3).

- 1 Pyke. <u>Symposia of the Swedish Nutrition Foundation VIII</u>, Uppsala: Almquist & Wiksells, pp.27-8, 1970.
- 2. Trapp & cannon. New Engl J Med, 304:172, 1981.
- 3. Meyer. Nutr Reviews, 38:53-64, 1978.

Food Processing: "Deductives."

Claim: Old fashioned methods of food processing, i.e., sun-drying, cellar storage smoking, pickling, salting, fermentation, etc., are superior to modern methods.

Fact: Nutrient losses during processing depend upon a variety of factors. These include the nature of the food in question, time of exposure to various temperature levels, ultraviolet light, acidity, alkalinity, and air. Also species variation, type and time of storage, and particularly the method of home preparation determine the final outcome. None of these factors were understood in previous times. Today we know that very few of the old-fashioned methods compare favorably to modern processing. Able to control the important factors that reduce the nutritional quality of foods modern food processors far exceed what was previously possible in nutrient retention (1).

1. Chichester. World_Review_Nutr_Diet, 16:318-333, 1973.

Claim: Food processing or cooking destroys enzymes that are important to human health.

Fact: People do not obtain needed enzymes from their diets.

The body manufactures the enzymes it needs for its own functioning. Enzymes themselves are organic compounds that will be broken down when coming into contact with digestive fluids (1). It is true that some people lack certain digestive enzymes which may be supplied as orally ingested supplements. However, these are coated so they can survive stomach acids and reach the small intestine. Even then only a small amount actually gets through (2), but this has been taken into consideration in the origin prescription. If it is present in sufficient amounts, Papain, the proteolytic enzyme found in papaya, may have a minor effect on stomach contents but the final results will have no significance to health.

- 1. Fletcher. JAMA, 232:657, 1975.
- 2. DiMagno, et al. New Engl J Med, 296:1318-22, 1977.

Claim: Enriched white bread is unhealthful because only a few nutrients are added back after many have been removed during milling.

Fact: It is true that many more nutrients are removed from flour during milling than are replaced by enrichment. However, the differences are insignificant when viewed from the perspective of the total diet. The minor nutrient losses are easily made up for by other foods in the diet. Faddists often compare white flour with whole wheat flour showing percentage losses to dramatize their claims. The facts are that people don't eat flour alone but products made from flour and other food substances. The resultant differences are more dependent upon those additional substances than the flour itself as has been demonstrated in animal feeding studies. When grain foods are eaten with milk and other wholesome foods differences vanish.

Claim: White bread has all of its fiber removed.

Fact: Milling reduces the dietary fiber content of flour by about two-thirds. This is about the same reduction found between white and whole wheat breads. However, white bread contains a substantial amount of dietary fiber when compared to other wholesome foods (See Table 2). If these other foods are not judged unhealthful due to their low fiber then neither should white bread be considered so.

Table 2.

Dietary fiber (percent of total weight)

Breads & Cereals	V	egetables		Fruits	
wholemeal bread	8.50% b	eans, baked	7 27°°	apples, flesh	1 42°°
wholemeal flour	9.51% b	roccoli tops	4 10%	apples, peel	371%
white bread	2.72% b	orussels spts	2.86%	bananas	1.75%
white flour	3.51% c	abbage	2 83%	cherries	1.24%
cornflakes	11.00% c	arrots	3 70%	peaches	2 28%
Bran	44.00% le	ettuce	1.53%	plums	1.52%

J. Human Nutr. 30:303, 1976

One of the easiest ways to increase dietary fiber intake is through the use of whole wheat rather than white flour cereal products. Whether or not this entails exchanging whole wheat for white bread is dependent upon the composition of the total diet. If total dietary fiber is adequate--some say about 37 grams per day (1)--daily whether or not the bread was white or whole wheat is inconsequential.

1. Kromhout, et al. The Lancet, pp.518-21, 9/4/1982.

Claim: Pasteurization cause major nutrient losses in milk, including the assimilation factor for calcium.

Fact: Nutrients in raw milk are no different than those discussed previously. Losses will depend upon the factors named. Table Two illustrates the effect various forms of pasteurization have on nutrient retention. There is no truth to the claim that pasteurization reduces the availability of calcium. To quote Lampert ". . . the body is capable of utilizing the calcium in either raw milk or pasteurized milk equally well, and. . .there is no significant difference in the retention of phosphorus and nitrogen from either type of milk" (1).

1. Lampert. "Milk as a food," In <u>Modern Dairy Products</u>, New York: Chemical Publ, p.5, 1975.

Sucrose Fallacies.

No substance is attacked by faddists with greater vehemence than sucrose. Many dentists uncritically accept sugar-related fallacies. This may be due to the fact that sucrose has been implicated in dental caries etiology, or simply because they share the generally negative image sugar has throughout society. Dentists I have dubbed "the Anti-sugar Warriors" (1) are obsessed with the notion that sucrose is the primary cause of dental caries. There seems to be no exaggeration the Anti-Sugar Warriors will not accept regarding sugar's alleged evils. This is epitomized in a dental group opposed to fluoridation due to their belief that fluoride "masks the effects" of sucrose in the diet when it reduces caries incidence although sucrose consumption remains unchanged (a reflection of Price's belief that tooth decay was but a symptom of "race decay"). It is my belief that the antisugar warriors impede the progress of preventive dentistry not only through their frequent opposition to fluoridation, but by diverting attention from efforts necessary to understand and find solutions needed to effectively fight the problem.

Correcting fallacies about sugar is difficult for two reasons. First, the public has exaggerated negative attitudes towards sugar. Marketing research reveals that 78% of consumers relate sugar to health in negative ways (2). Second, is the ambivalence dental health educators must necessarily hold toward sucrose. In dental caries potential harm is related to frequency, physical properties of sweets, and the oral

environment. Nutrition scientists must admit that, as a substance, sucrose is harmless and useful. However, they do not wish to convey the idea to the public that, because this is true, sucrose can be used as freely as a natural attraction to its sweetness might dictate. The attempts of nutritionists to convey this complex message is further confused by faddists who misperceive and exaggerate the facts.

- 1. Jarvis. "Dubious Dentistry," in <u>The Health Robbers</u>. Philadelphia: George Stickley Co., 1976.
- Maracom Research Corporation and Nutrition and Marketing Research Departments of General Mills Inc. Dewline. Changing consumer values and behavior related to food. Minneapolis: General Mills, Inc. Report 15, 1980.

Claim: Sugar is a poison.

Fact: Sucrose is pure carbohydrate made up of equal parts of fructose and glucose. It is metabolized completely to carbon dioxide and water (1). There are no toxic effects from sugar in any amount, although eaten by itself it would produce gastrointestinal irritation.

. 1. Levine. "Carbohydrates," in Goodhart & Shils Modern Nutrition in Health & Disease, Philadelphia: Lea & Febiger, pp.99-116, 1874.

Claim: Sugar is addicting.

Fact: This claim combines overstatement and the use of a negative "buzz word" to make an invalid point register emotionally. The human tongue is loaded with sweet receptors making sugar's appeal universal. This has been pointed to as a survival mechanism by anthropologists since many naturally occurring toxicants are bitter and edible goods tend toward sweetness (1). Animal feeding studies of "addiction" are not transferable to humans because caged rats easily acquire food preferences mimicking addiction. This even occurs using water (2). Animals have demonstrated a preference to Saccharin exceeding that of ethanol and food - even to starvation (2).

Note: It is possible for anything someone finds pleasurable to become a coping device and be abused. Since sweet taste is a naturally-pleasurable, sensory experience, it is possible for it to be involved in such behavior. However, it is important to differentiate between psychological dependency or habituation and actual physiological addiction when dealing with this problem. The fact that sweet abuse behavior in animals (and humans) is not true addiction is evidenced by: (a) there is no evidence of dose escalation or tolerance; and, (b) there are no withdrawal symptoms (2).

- 1. Beidler. "The biological and cultural role of sweeteners," in <u>Sweeteners: Issues and</u> <u>Uncertainties</u>. Washington, DC:National Academy of Sciences. pp.11-18, 1975.
- Falk. "Sweet abuse and the addiction model," in <u>Taste and Development: The Genesis</u> of <u>Sweet Preference</u>, 27:374-385. Washington, DC: U.S. Department of Health, Education and Welfare, Public Health Service, 1977.

Claim: Sugar is the primary cause of heart disease.

Fact: This idea was popularized by Yudkin in his book <u>Sweet and Dangerous</u>. Yudkin may deserve the grand prize for exaggeration for his statement, "By encouraging the development of a sweet tooth in children, we may be doing them even more harm than if they were encouraged to begin smoking at the age of 12 or 15" (1). Yudkin's theory has been discredited because evidence, both epidemiological and experimental, has failed to support it (2).

- 1. Yudkin. Sweet and Dangerous, New York: Peter H, Wyden, Inc. 1972.
- 2. Grande. "Sugar and cardiovascular disease." World Review Nutr Diet, 22:248-69, 1975.

Claim: Honey is better for a person than sugar.

Fact: Sucrose is 50% D-fructose and 50% D-glucose. Honey's composition is shown in Table Three. Taking moisture content into account, there is only a small difference between honey and sucrose. Honey is slightly higher than sucrose in fructose, an unimportant factor in most cases, but a negative factor for 10-12 percent of the population in whom fructose will increase serum triglycerides (173). Advocating honey in place of sugar is a false illusion fostered by faddists. There is little nutritional difference between these two sweeteners. From the point of view of safety, sugar is safer because honey can be contaminated with botulism (1.2), can be poisonous due to toxic nectar (3), and is sometimes more cariogenic (4); yet faddism extols honey as a traditional symbol of healthful naturalism.

- 1. Gregg. Follow-up on infant botulism-United States. 1978. <u>Morbidity & Mortality Weekly</u> <u>Report.</u> 27:17. Atlanta, GA: Center of Disease Control.
- 2. Gregg. "Honey exposure and infant botulism." <u>Morbidity & Mortality Weekly Report</u>, 27:249. Atlanta, GA: Center for Disease Control. 1978.
- Coon. Discussion. In <u>Toxicants Occurring Naturally in Foods</u>. 27:281. Washington, DC: National Academy of Sciences, p.301, 1966.
- 4. Newbrun. "The role of manufacturers in the dietary control of caries," <u>J Amer Soc Prev</u> Dent, 4(5):33-44, 1974.

Claim: Sugar lowers the body's resistance to fighting disease.

Fact: This claim is based upon a study (1) which compared the effects of fructose, glucose, honey, sucrose, orange juice and starch on the average number of bacteria neutrophils could phagocytize at specified time intervals following ingestion by subjects who had fasted for 12 hours. All of the substances reduced phagocytosis. The simple sugars performing about the same and starch reducing phagocytosis more It is typical of food faddists only to point out sucrose as having reduced slowly. phagocytosis ignoring honey and orange juice. Some faddists have claimed that this study proves that eating candy during the Christmas season is the cause of more colds during the holidays. Such claims ignore the fact there is more cross contact among people during holiday periods and that colds are caused by viruses, not The practical significance of this study as a dietary guide is questionable bacteria. because many substances will reduce the phagocytosis of neutrophils including vitamin C (2) and vitamin E (3).

- 1. Sanchez, et al. "Role of sugars in human neutrophilic phagocytosis," <u>Amer J Clin Nutr.</u> 26:1180-1184, 1973.
- Prasad. "Effect of vitamin E supplementation on Leukocyte function," <u>Amer J Clin Nutr.</u> 33:606-608, 1980.
- Shilotri & Bhat. "Effect of mega doses of vitamin C on bactericidal activity of leukocytes," <u>Amer J Clin Nutr</u>, 30:1077-81, 1977.

Claim: Sugar is only "empty calories."

Fact: A calorie is a unit of energy measurement, therefore it is not "empty". It is true that sucrose has no vitamins or minerals, but neither do vitamins or minerals have caloric value, therefore, each is empty of something nutritionally significant. The reality is that vitamins, minerals and calories are needed in nutrition. If excessive calories are causing an individual problem, the mere fact vitamins and minerals are present makes them no less a problem. The place to start cutting down on calories is with fats which have 225% more calories per gram. Cutting down on sweets generally also helps because they often combine sugars and fats. An analysis of many "fattening sweets" will show that fats often make up a greater portion of the calories than sugar.

Claim: Sugar causes malnutrition by using up the "B" vitamins. Fact: Carbohydrate metabolism does require the B-complex of vitamins to finally convert carbohydrates to CO2 and H2O. Of these, thiamine is the

only one directly linked to the caloric consumption of carbohydrates (1). Failure to supply sufficient thiamine results in a build up of pyruvic acid leading to symptoms known as the disease of "beri beri". Polished rice as a staple was responsible for this disease leading to the discovery of the first vitamin by Funk (2). Despite concerns about the amount of sucrose in the American diet, beri beri is extremely rare, and to my knowledge has yet to be associated with sucrose consumption in a population.

- 1. Levine. "Carbohydrates," Chapter 3 in Goodhart and Shils, Modern Nutrition in Health
- and Disease, Philadelphia: Lea & Febiger, 1974.
 - 2. Funk. "The etiology of the deficiency diseases," J State Medicine, 20:341-368, 1912.

Claim: Sugar causes the glucose curve to "spike" and "crash" (i.e., hypoglycemia). Fact: The picture of a "spiking" and "crashing" curve describes what happens to a person who has been diagnosed as a true hypoglycemic during a glucose tolerance The anti-sugar warriors misrepresent this as an ordinary response to sweets in test. a normal, mixed diet. The validity of the glucose tolerance test as an indicator of hypoglycemia is open to question since researchers have found that a large number of normal people demonstrate the same drop in blood glucose without symptoms (1). The accuracy of diagnosis of hypoglycemia based upon patient symptoms is also highly questionable. Tests have shown that 50% of patients on a 5-hour glucose tolerance test will demonstrate symptoms even though their glucose level is constant (1,2,3). Hypoglycemia has been a subject of abuse by many self-proclaimed experts because of its ambiguous nature and now qualifies as a "fad" disease. True reactive hypoglycemia can be firmly diagnosed, but is relatively rare. Interestingly, the symptoms described by many as hypoglycemia are very much like anxiety neurosis (4,5). The chances are very good that it is being misdiagnosed as such.

Anxiety neurosis can be expected to respond well to the placebo effect, and is ordinarily temporary in its prognosis. Other explanations suggested for symptoms people experience which are sometimes diagnosed as hypoglycemia include masked addiction (6), caffienism (7), and other causes of adrenal insufficiency (8). Unqualified clinicians can easily be misled when by favorable outcomes. Stewart (9) lists hypoglycemia among numerous somatization disorders frequently misdiagnosed.

- Siperstein. "The hypoglycemia dilemma," Emerg Med, pp.133-44, 12/77.
- 2. Ford, et al. "A psychiatric study of patients referred with a diagnosis of hypoglycemia," Amer J Psychiatry, 133:290-294, 1976.
- Johnson, et al. "Reactive hypoglycemia," JAMA, 243:1151-1155, 1980. 3.
- 4.
- Deutsch. The New Nuts Among the Berries, Palo Alto: Bull Publ. pp 315-16, 1976. Williams. "Systematic management of the anxious patient," Amer Fam Physician "Systematic management of the anxious patient," Amer Fam Physician, 5. 15:124-129, 1977.
- Rippere. "A little something between meals; masked addiction, not low blood sugar," The 6.
- Lancet. p.1349, June 23, 1979. Lamb. "Controversial beverages: coffee, tea, colas and chocolate," The Health Letter 14:1 7. (August) 1979.
- 8. American Diabetes Association, The Endocrine Society and the American Medical Association. Statement on hypoglycemia. JAMA, 223:682, 1973.
- Stewart, "Emotional disorders misdiagnosed as physical illness: environmental 9. hypersensitivity, candidiasis hypersensitivity, and chronic fatique syndrome," International J of Mental Health, 19:(3):56-68, 1990.

Claim: Raw sugar is better than white sugar. Fact: No refined sugar, raw, brown or white contains significant amounts of vitamins or minerals. Raw sugar's color is due to the presence of impurities (1).

Newbrun. "The role of manufacturers in the dietary control of caries," J Amer Soc Prev 1. Dent, 4(5):33-44, 1974.)

Claim: Sugar causes caries systemically.

Fact: This claim is refuted by well known studies in which test animals were fed cariogenic diets by stomach tube producing no caries (1), and the fact that human teeth set in dentures decay the same microscopically as natural teeth (2).

- Kite, et al. J. Nutr., 42, 1950. (In Nizel. <u>Nutrition in Preventive Dentistry: Science and Practice</u>, Philadelphia: WB Saunders, 1972.
- 2. Brannstrom, et al. "Experimental carles in young human permanent teeth implanted in removable dentures," <u>Arch Oral Biol</u>, 22:571-578, 1977)

Dietary Supplementation.

Claim: Extra vitamins provide more pep and energy.

Fact: Vitamin deficiencies can cause debilitating diseases but vitamins produce no energy beyond normal functioning. People who claim energy responses are experiencing a placebo response. This was documented in the FDA Study which found that such responses were related to expectation (1).

1. FDA <u>A Study of Health Practices and Opinions</u>, Philadelphia: National Analysts, Inc. Part II, p. 65. 1972.

Claim: Extra vitamin C will help prevent colds.

Fact: No single claim for vitamin supplementation has been more thoroughly discredited than this one (1,2,3). At best, extra vitamin C (up to 250 mg. daily) will produce a weak antihistamine effect, but will have no effect upon the incidence or duration of colds (4).

- 1. Coulehan, et al. "Vitamin C and acute illness in Navajo school children," <u>New Engl J</u> Med, 295:973-977, 1976.
- 2. Miller, et al. "Therapeutic effect of vitamin C: a co-twin study," JAMA, 237:248-251, 1977.
- 3. Pitt and Costrini, "Vitamin C prophylaxis in marine recruits," JAMA, 241:908-911, 1979.
- 4. "Is vitamin C really good for colds?" Consumer Reports, Feb., 1976.

Claim: Everyone needs to take vitamin and mineral supplements to insure good nutrition.

Fact: Self-prescribing nutrition supplements hasn't been shown

to lead to better nutrition. Studies among the elderly have found that marginal deficiencies exist even among those taking supplements because they were taking the wrong ones (1,2,3).

- 1. Bosse, and Donald, "The vitamin B6 requirement in oral contraceptive users," <u>Amer J</u> <u>Clin Nutr</u>, 32:1015-1023, 1979.
- 2. Read and Graney, "Food supplement usage by the elderly," J Amer Diet Asso, 80:250-253, 1982.
- 3. Wilson, "Food allergy," The Lancet, p.450, Feb 24, 1979.

Claim: National nutrition surveys show that significant portions of the population are deficient in a number of nutrients.

Fact: Nutrition surveys are generally directed at portions of the population were undernourishment is suspected. Results of these studies are not applicable to the general population. In addition, the standards used are usually the Recommended Dietary Allowances (RDAs) which are set two standard deviations above the mean for known dietary needs within populations. These standards are considerably higher than what is needed for health among population groups, and include an extra margin for maintaining body stores to cover possible periods of deprivation. Simply being below the RDAs does not constitute malnutrition.

Claim: Dieters, finicky eaters, smokers, drinkers, people under stress and women on the pill need to supplement (promotional claim by a major vitamin company). Fact: The idea that pill swallowing can make up for ad eating habits, alcohol and tobacco abuse, or problems associated with stress-related anxiety is an attempt at "quick-fix" health. These problems need to be dealt with at their sources, not by self-deluded supplementation. The claim that women on the pill need to supplement is based upon the fact that one of the parameters used to assess vitamin B6 status is greatly reduced by oral contraceptives while others are not so greatly affected. Commercial interests make much of this, but scientist do not recommend supplementation (1,2). RDAs for vitamin C were determined by studies on smokers (3) meaning that nonsmokers need less vitamin C rather than smokers more.

- Bosse and Donald. <u>Amer J Clin Nutr</u>, 32:1015-23, 1979.
 Bosse and Donald. <u>Amer J Clin Nutr</u>, 32:1024-32, 1979.
- 3. "The vitamin pushers," Consumer Reports, March, 1986.

Claim: Natural vitamins are superior to synthetic vitamins.

Fact: Even the faddists are divided on this claim. Even vitamin gurus Adelle Davis and Linus Pauling both argue that there is no difference between natural and synthetic vitamins (1,2). The question is academic since practically all commercial brands of food supplements are synthetic. Natural vitamins are too expensive to produce. Vitamins labeled as "natural" usually contain synthetic vitamins to which a small amount of natural substance has been added for marketing reasons (3).

- 1. Davis. Let's Eat Right to Keep Fit, New York: Harcourt, Brace, Janovich, p.225, 1954.
- 2. Pauling. Vitamin C and the Common Cold, San Francisco: Freeman, p.89. 1970.
- Hidden Facts That Everyone Should Know About So-called "Natural" Vitamins. La 3 Canada, Calif.: Bronson Pharmaceuticals. (undated)

Claim: Bioflavonoids must be included in our daily diets for vascular health. Fact: Originally, researchers who worked with vitamin C thought that the flavonoids (a widely occurring group of natural pigments in flowers, fruits, grains and vegetables) were effective in connection with vitamin C in decreasing capillary permeability. For a time they were designated at "vitamin P". Subsequent work found this to be untrue and, as yet, no evidence has been found that these are essential elements (1).

1. Herbert, "Pseudovitamins," Chapter 25 in Shils and Young, Modern Nutrition in Health and Disease, Philadelphia: Lea & Febiger, 1988.)

Claim: Megadoses of vitamins will produce a therapeutic effect. Fact: Herbert most clearly disclaims this notion. He says:

> The term "megavitamin therapy" as used by nutrition cultists is a misnomer, since it misinforms about mode of action: It is really megachemical therapy and not nutrient therapy. Vitamins function in regulating specific metabolic activity, usually by acting as coenzymes, with vitamin D also functioning as a hormone. When the vitamin coenzymes enter the body, they are taken up by the cells that need them and combined with a protein (apoenzyme) already present, to form a holoenzyme (referred to simply as enzyme). Thus, vitamins generally have no useful metabolic function by themselves. Only when combined with its appenzyme within the cell does a vitamin become capable of vitamin function. The quantity of apoenzyme that any cell can make per unit of time is limited, as is the capacity of the cell to make any protein per unit of time. That limited capacity is saturated at levels of vitamin roughly in the range of the recommended dietary allowance, so that any

excess vitamin coming in cannot serve a vitamin function. Since all vitamins are chemicals as well as nutrients, such excesses can only function as a chemical and not as nutrients (1).

Vitamin therapy has very limited usefulness. These have been outlined clearly by the AMA Council on Scientific Affairs 92).

- 1. Herbert, "The vitamin craze," Arch Intern Med, 140:173-176, 1980.)
- "Vitamin preparations as dietary supplements and as therapeutic agents." JAMA, 257:1929-36, 1987.

Diet Cures.

Claim: If you eat the right foods the body will cure itself because health is natural and disease is unnatural, and you are what you eat.

Fact: The above claim is the underlying principle of diet cure. It is a basic tenet of "naturopathic medicine" rooted in a "vitalistic" world view. It reality, it is very much like "orthomolecularism" which theorizes that if you get the "right molecules" in the cell, it will naturally be healthy (the right molecules are supplied by megadoses of vitamins). The falsity of this principle is found in the basic laws of nature [thermodynamics]. The law of entropy reveals that within a closed system orderliness degenerates to randomness. Disease, which Bernard (1) determined to be based upon internal disorder, is a natural-albeit abnormal-phenomenon. We are, therefore, not only what we eat, but what genetics dictate as they follow the laws of nature. Certainly cellular insults stemming from the environment play an important role in the process, but the superior forces of natural law dominate. The idea that ingesting symbolically "good" food and avoiding symbolically "bad" foods will lead to cure of serious diseases is an illusion perpetuated by food faddists and quacks.

1. Robin, "Claude Bernard pioneer of regulatory biology," JAMA, 242:1283-4, 1979.

Claim: Certified raw milk is a good food for invalids.

Fact: A San Francisco court determined in 1989 that advertisements by Alta Dena Dairy, the nation's leading marketer of CRM, that CRM was an "ideal formula-milk for babies and. . . a basic food for invalids" were false and dangerous. In fact, CRM is a potent source for <u>Salmonella dublin</u> infection which can kill infants and people with compromised immune systems (1). The company was ordered to place a clear warning on CRM that it may contain dangerous bacteria and specifying those at highest risk as "babies, pregnant women, the elderly, alcoholics, those with cancer, AIDS or reduced immunity, and those taking cortisone, antibiotics or antacids." (21).

1. Richwald, et al. Publ Health Reports, 103:489-93, 1988.

2. Consumer's Union News, Press release, April 10, 1989.

Questions

- 1. The basic premise of food faddism is best expressed by:
 - a. the concept of "good food" vs. "bad food."
 - b. "you are what you eat."
 - c. "food is medicine."
 - d. "natural is better."
- 2. The law that went against principles of consumer protection to allow dubious dietary supplements to be sold is the:
 - a. Harris-Kefauver bill.
 - b. Sherley Amendment.
 - c. Proxmire bill
 - d. Medical Device Amendment.
- 3. The DDS who never practiced dentistry, was a major promoter of food misinformation, and helped train the operator of the nation's most prolific diploma mill was:
 - a. Royal Lee, DDS
 - b. Weston Price, DDS
 - c. Melvin Page, DDS
 - d. Emanuel Cheraskin, MD, DMD
- 4. The invalid method of nutritional assessment that combines a video camera with dark-field microscopy to visualize blood smears is:
 - a. Reams test.
 - b. lingual vitamin C test.
 - c. cytotoxic test.
 - d. Live cell test.
- 5. The invalid muscle-response test, invented by a chiropractor, that claims to be able to evaluate supplementation needs and a variety of other factors is called: a. dental kinesiology.
 - b. behavioral kinesiology.
 - c. applied kinesiology.
 - d. all of these.
- 6. Patients are most apt to be able to spot a spurious nutrition consultant by: a. their bogus credentials.
 - b. the kinds of tests they use to determine health status.
 - c. their overemphasis upon supplementation.
 - d. their practice "style."
- 7. The idea that tooth decay was an indicator of "race decay" is associated with: a. Earnest Hooten, PhD
 - b. Weston Price, DDS
 - c. Francis Pottenger, MD
 - d. Royal Lee, DDS
- 8. The idea of "balancing body chemistry" originated with:
 - a. Hal Huggins, DDS
 - b. Granville Knight, MD
 - c. Melvin Page, DDS
 - d. Weston Price, DDS

- 9. The flawed "susceptibility-resistance principle" of disease is associated with: a. Emanuel Cheraskin, MD, DMD
 - b. Hal Huggins, DDS
 - c. Royal Lee, DDS
 - d. Roy Kupsinel, MD
- 10. A majority of Americans misbelieves that:
 - a. depleted soils produce foods of poor nutritional value.
 - b. food additives take away our food's health value.
 - c. much of our food is overprocessed and has lost its health value.
 - d. all of these
- 11. The effects upon crops grown on depleted soils will be:
 - a. normal looking, but nutrient-depleted produce.
 - b. unattractive produce.
 - c. reduced yields of produce.
 - d. all of these.
- 12. The old-fashioned method of food processing that is superior to modern day freezing, dehydration, or canning is:
 - a. sun-drying
 - b. pickling
 - c. salting
 - d. none of these
- 13. Honey is preferable to sucrose for the following reason:
 - a. it is safer for infants.
 - b. it is less cariogenic.
 - c. it less addicting.
 - d. none of these
- 14. The author recommends that dentists desiring to offer comprehensive nutrition counseling to their patients
 - a. do it themselves based upon their predoctoral training.
 - b. contract with a Registered Dietitian to come in to the office.
 - c. obtain additional training in dietetics if they wish to do it themselves.
 - d. b and c.
- 15. Psychoneurosis (somatization disorder) is often misdiagnosed as:
 - a. food allergy.
 - b. yeast infection.
 - c. amalgam toxicity.
 - d. all of these.

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PART FOUR

QUACKERY: A NATIONAL SCANDAL

The Size of the Problem

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Quackery: A National Scandal

The Size of the Problem

In 1983, the U.S. Senate Committee on Aging completed a national survey of over 1,300 State Consumer Affairs Offices, Chiefs of Police, District Attorneys, and state Attorneys General. The committee's list of the ten most harmful frauds directed against the elderly was:

- (1) Quackery and medical related frauds.
- (2) Home repair and improvement frauds.
- (3) Bunco schemes.
- (4) Insurance frauds.
- (5) Social frauds.
- (6) Land and housing frauds.
- (7) Business and investment frauds.
- (8) Nursing home frauds.
- (9) Automobile frauds.
- (10) Funeral frauds. (1)

In 1984, the U.S. House Subcommittee on Aging and Long-term Care chaired by Florida Congressman Claude Pepper culminated an intensive four-year study of quackery and its impact upon the elderly. That committee estimated that the elderly were being bilked out of at least \$10 billion per year, and that the nation as a whole was probably wasting \$25 billion on quackery. Most shocking, were the estimates that this exceeds by several magnitudes the \$3.8 billion spent annually for all health research at the National Institutes of Health (2).

In 1986, Louis Harris and Associates conducted a national sample survey of American adults by telephone to determine the use of questionable health care products for fifteen treatment areas:

(1)Relieve stress, tension and anxiety.

(2) Rejuvenate skin / remove wrinkles.

(3) Relieve pain without medication.

(4) Prevent disease.

(5) Reduce cholesterol level.

(6)Increase strength.

(7) Reduce the risk of cancer.

(8) Stop smoking painlessly.

(9) Eliminate body poisons or toxics.

(10)Slow down the aging process.

(11)Restore hair or promote hair growth.

(12)Enhance memory or intelligence.

(13) Remove cellulite.

(14) Improve sexual performance.

(15)Increase bust size. (3)

The study found that 26.6% of the American public used one or more questionable health care treatments. Twenty-one percent used a questionable health care product during the past year. The first figure translated into approximately 46 million, and the latter into 38 million users.

1. Heinz J. "Consumer frauds and elderly persons: a growing problem," Special Committee on Aging, United States Senate, Washington, D.C., April, 1983.

2. Pepper C. "Quackery: a \$10 billion scandal," Subcommittee on Health And Long-

Term Care of the Select Committee on Aging, U.S. House of Representatives, No.98-435, 1984.

 Louis Harris and Associates. <u>Health, Information and the Use of Questionable Treatments:</u> <u>A Study of the American Public</u>. Washington, D.C.: U.S. Department of Health and Human Services, September, 1987.

What is Quackery?

The Pepper Committee defined <u>quackery</u> as "the practice or pretensions of a quack" (3), and a <u>quack</u> as:

Anyone who <u>promotes</u> (emphasis added) medical schemes or remedies known to be false, or which are unproven, for a profit.

The committee rightly centered the word <u>promotes</u> which means "to contribute to the growth and prosperity of; to present for public acceptance through advertising and publicity" (1). Promotionalism is the essence of quackery because the term is derived from "quacksalver" which means literally to "quack like a duck about (one's) salves and remedies" (2). Inadequate definitions of quackery wrongly focus on characteristics such as <u>pretense or imposture</u> disregarding the fact that quacks may be licensed health care providers who have abandoned the scientific rigor and ethics of their professions, or otherwise competent providers outside of their scopes of practice. Other definitions wrongly limit quackery to <u>fraud</u> which is "an intentional perversion of truth for gain" (3). This overlooks the most dangerous of all quacks which is the truebeliever whose zeal knows no limits. Sincerity may make quackery more socially tolerable, but may serve to make a quack more dangerous.

- 1. Webster's New Collegiate Dictionary.
- 2. Funk W. Word origins, New York: Bell Publishing Company, 1950.
- 3. Blacks Law Dictionary

Clinical art vs quackery. All practitioners utilize methods which are unproven. It is important to make a distinction between <u>utilizing</u> and <u>promoting</u> unproven methods. Clearly, every practitioner who utilizes a placebo is employing a false remedy, and clinical research involves the use of unproven methods. Managing chronic conditions may require empirical innovation, and many aspects of clinical practice involve <u>art</u> rather than science. No doubt many of the techniques which make quacks successful can and should be employed by legitimate practitioners. The difference is that ethical practitioners do not <u>promote</u> such procedures commercially--especially as "alternatives" to remedies that have met scientific standards of safety and effectiveness.

Defenders of quackery are fond of citing a 1978 Office of Technology Assessment Report stating that "only 10 to 20 percent of procedures currently used in medical practice have been shown to be efficacious by controlled trial (1). The proponents of deregulating health care avoid mentioning that the report was not advocating that there be less science in health care, as they do, but recommended ways for improving safety and efficacy. When interpreting the report it is also worth remembering that only since 1962, with passage of the Kefauver-Harris Amendments, have drugs been required to meet efficacy requirements before marketing, and medical devices have only had to meet premarketing efficacy requirements since passage of the Medical Devices Act of 1976.

The OTA Report noted that controlled clinical trials had only gained prominence in the past 10-20 years at that time. By far the most common method for estimating safety and efficacy has been clinical experience based upon informal estimation techniques. Other methods include epidemiological studies, and formal concensus development.

3

The OTA report reviewed seventeen different procedures* in common use and described how each had achieved its present level of acceptance.

"[Pap Smear cervical cancer; Amniocentesis; Chicken Pox Vaccine; Mammography; Prophylactic Oral Antibiotics in Elective Colon Surgery; Skull X-Ray; Electronic Fetal Monitoring; Surgery for Coronary Artery Disease, Tonsillectomy; Appendectomy; Hysterectomy; Drug Treatment for Hypertension; Drug Treatment for Otitis Media in Children; Cast Application for Forearm Fracture; Treatment of Hodgkin's Disease. Chemotherapy for Lung Cancer; Hyperbaric Oxygen Treatment for Cognitive Deficits in the Elderly]

Many procedures in use at the time of the enactment of the Kefauver-Harris Amendment were grandfathered. Ultimately, these will either be proven or fall into disuse. This will take many more years, but these laws put health care on the right track. The fact there are remedies still in use that have not yet been brought up to standard is not justification for permitting quackery. Responsible health care providers will press for scientific testing and readily abandon untested therapies when proven procedures are established. The 1978 OTA Report represented an effort to improve the system of evaluating the the efficacy and safety of medical technologies, not turn back the clock to a wide-open, buyer beware health marketplace.

 Office of Technology Assessment. <u>Assessing the Efficacy and Safety of Medical</u> <u>Technologies</u>, Washington, D.C.: U.S. Government Printing Office, Stock No. 052-003-00593-0, Library of Congress #78-600117, 1978.

The Real Issues.

There is little controversy over the idea that promoting "medical schemes or remedies known to be false" constitutes quackery. Only libertarians who argue for a complete "buyer beware" marketplace in which fraud and deception would be permitted, without accountability, defend such a notion. Less clear to some is the concept that promoting medical schemes or remedies which are "unproven, for a profit" is worthy of the label of quackery. They argue that all experimental procedures are "unproven" and that science advances by experimentation.

The difference is that legitimate researchers do not <u>promote</u> their procedures in the health care marketplace, but engage in responsible, peer-reviewed studies with proper protocols. Patients who become subjects in a study do so with full knowledge that they are "guinea pigs" and are not to be charged a fee for their participation. Human studies review panels have determined as much as possible any risks involved and these are to be explained.

<u>Caveat emptor</u> (i.e., let the buyer beware) was once the universal law of the marketplace. It is based upon the EQUALITY of bargaining positions of buyers and sellers. In Medieval times this was practical because people bargained for common products with friends and neighbors. When trade began to expand, buyers were forced to trust the word of sellers that items were what they were represented to be. It was then, during the 15th century that the concept of <u>caveat vendor</u> (i.e., let the seller beware) became the rule for marketplace situations in which buyers and sellers were on UNEQUAL terms (1). All consumer protection law is founded upon the caveat vendor principle. Figure 9 summarizes advances in federal consumer protection legislation

Drugs and medical devices are legally defined according to their intended use. Anything that purports to prevent, diagnose, treat, mitigate, or cure any physical or mental disorder in man or any other animal must meet reasonable standards of safety and effectiveness for its intended purpose.

Burden of proof. Nothing is presumed to be safe or effective until demonstrated to be.

and the burden of proof is on proponents. Placing the burden of proof upon proponents is both practical and logical. It is practical because no agency could ever test ideas as rapidly as people can dream them up. It is logical because only the proponents can be expected to know exactly how the procedure is to be applied. Proponents are assumed to best understand how to rightly apply the method. Their task is to write up their protocol so that anyone following it can be expected to obtain similar results. If others fail to get good results from a procedure, proponents can easily argue that the procedure was wrongly applied.

Quacks commonly employ the red herring tactic of claiming that "the establishment" refuses to test their claims. When a test is done, they complain that the procedure was applied in the wrong amount, the wrong kind, on the wrong people, for the wrong condition, under the wrong circumstances.

1. Magnuson WG, Carper J. <u>The Dark Side of the Marketplace</u>, Englewood Cliffs: Prentice-Hall, Inc., 1972.

Different Kinds of Quacks

Anyone may engage in quackery. It is possible to be scientific in one area and engage in quackery in another. Quackery connotes a way of behaving, not a permanent label of class of people. It makes sense to define quackery behaviorally and let those wear it if "the shoe fits." Dictionaries and other reference sources provide many terms that describe a variety of traditional quacks:

Charlatan: Faker or fraud (1).

<u>Crank</u>: An eccentric person (1) who believes his theories. <u>Fringe practitioner</u>: One with marginal or extremist views (1). <u>Huckster</u>: Hawker, peddler; to retail for profit; to promote by showmanship (1). <u>Maverick</u>: An independent individual who refuses to conform (1). <u>Mountebank</u>: One who sells quack medicines from a platform (1). <u>Pseudoscientist</u>: One who advances a system of theories, assumptions and methods erroneously regarded as scientific (1). <u>Quack</u>: Anyone who promotes medical schemes or remedies known to be false, or which are unproven, for a profit. (2) <u>Quackery</u>: The practice or pretensions of a quack (1).

- 1. Webster's New Collegiate Dictionary.
- Pepper C. "Quackery: a \$10 billion scandal," Subcommittee on Health and Long-Term Care of the Select Committee on Aging, US House of Reps, No.98-435, 1984.

Why Health Professionals Become Quacks

It is especially disappointing when an individual trained in the health sciences turns to promoting quackery. Friends and colleagues always wonder how this can happen. It is difficult to ascertain just what exactly motivates each individual engaged in quackery. Some reasons appear to be:

(1) <u>Boredom.</u> Daily practice can become humdrum. Pseudoscientific ideas can be exciting. Carl Sagan believes that the qualities that make pseudoscience appealing are the same which make scientific enterprises so fascinating. Sagan says: "I make a distinction between those who perpetuate and promote borderline belief systems and those who accept them. The latter are often taken by the novelty of the systems, and the feeling of insight and grandeur they provide" (1). Sagan laments the fact that so many are willing to settle for pseudoscience when true science offers so much to

those willing to work at it.

(2) Low esteem. Some are seduced by a perception that their profession is held in low esteem. Psychologists have been lured into believing they can treat cancer through mental manipulations of imagery, meditation, biofeedback, and so forth. Although these may be suitable for research, no solid evidence justifies marketing these as effective therapies. Registered Nurses and Medical Doctors untrained in oncology have fallen into cancer quackery out of a failure to understand the disease for which they are giving treatment. For some it is not enough to be thought of as a good dentist. Dissatisfied with their limited scope of practice, they want to be fullfledged physicians with few restraints.

(3) <u>Reality shock.</u> Maple writes, "in the face of the great leveler, Death, we are all children, listening fearfully for the footsteps of doom--relieved only by the whisperings of hope; the quack is the peddler of hope" (2). All humans are vulnerable to death anxiety. Health personnel who regularly deal with terminally-ill patients must make psychological adjustments accordingly. Some are simply not up to it. Investigation of quack cancer clinics have found MDs, DDSs, RNs, and other health professionals who became disillusioned with regular care because of the harsh realities of the side-effects or acknowledged limitations of approved therapies.

(4) <u>Beliefs encroachment.</u> Science is limited in its methodology to dealing with observable, measurable and repeatable phenomena. Those beliefs which transcend science must necessarily fall into the realms of philosophy and religion. Some people allow such beliefs to inappropriately encroach upon their practices. While one may exercise religious or philosophical <u>values</u> of compassion, generosity, mercy, and integrity (which is the foundation of the scientific method's search for objective truth), it is not appropriate for a health professional to permit metaphysical (i.e., supernatural) notions to displace or distort scientific diagnostic, prescriptive or therapeutic procedures. Individuals who wish to work in the area of religious belief should pursue a different career.

(5) <u>The profit motive.</u> Quackery can be extremely lucrative. Claiming to have a "better mousetrap" can cause "the world to beat a path to one's door." Greed can be enough for entrepreneurial-minded practitioners to set aside ethical principles.

(6) The Prophet motive. Dominian (3) elucidates the important role health care providers play that parallels the three basic meanings of the word "prophet." The first refers to the person who speaks for God, the second to the prophetic writings of the Old Testament, and the third to one who is a visionary or prognosticator (7). Doctors deal with illness, suffering and death. In doing so, they encounter individuals who are experiencing uncertainty, doubt and fear about the meaning and purpose of life. The doctor is made into one who is expected to refer to ultimate values and God. Trust, hope and love--ingredients of faith--are inextricable from the doctor-patient relationship. Just as Old Testament prophets called for conversion and repentance. Dominian notes that doctors have to convert patients away from smoking, obesity, stress, alcohol and other indulgences. As prognosticators, doctors foretell what is going to happen if patients don't change their ways of life. The power over people the Prophet role provides is awesome. Some doctors consciously avoid it. They are right to teach patients self-reliance and discourage dependency behavior, but in doing so they may fail to meet important emotional needs in their patients. Quacks, on the other hand. revel in, encourage and exploit this power. Egomania is commonly found among quacks. They enjoy the adulation and discipleship their pretense of superiority evokes. By promoting themselves, they project superiority not only to their clinical colleagues. but to often to the entire scientific community.

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- 1. Sagan. Broca's Brain, New York: Ballantine: 1979
- 2 Maple. Magic, Medicine and Quackery.
- 3 Dominian. "Doctor as prophet." Brit Med J. 287 1925-1927. 1983.

Deeper Psychological Insights

<u>Psychopathic personality disorder</u>. Insight into the psychodynamics of quackery is seen in studies of the psychopathic personality. Reid, et al (1) present a series of research papers that included enlightening work by Dr. Robert Hare who has done work on psychopaths for more than twenty years. Hare states, "You find psychopaths in all professions. He's the shyster lawyer, the physician always on the verge of losing his license, the businessman with a string of deals where his partners always lose out" (2). Hare describes characteristics of the psychopathic personality as lacking a capacity to feel compassion or pangs of conscience. Psychopaths exhibit glibness and superficial charm, grandiose sense of self-worth, pathological lying, conning/manipulative behavior, lack of guilt, proneness to boredom, lack of empathy and others often seen in quacks. According to Dr. Hare, such people suffer from a cognitive brain defect that prevents them from experiencing sympathy or remorse.

The conversion phenomenon. Another writer who offers insight into some reasons why health professionals fall into quackery is William Sargant (3), the British psychologist who uncovered the process of "brain-washing" used on American prisoners-of-war by the North Koreans. The process involved producing overwhelming stress to the point that it produced protective inhibition and dysfunction. Among the significant responses were the "ultraparadoxical phase" in which positive conditioning reversed itself to where respondents now loved what they previously hated, and vice-versa; and, the "hypnoidal phase" in which the brain stops computing critically the impressions received. Many individuals who become quacks have gone through emotionally shattering experiences such as a practice failure, midlife crisis, divorce, life-threatening disease, and so forth. The finding of a study of why physicians had taken up holistic practices was consistent with the conversion theory. By far the greatest reason given (51.7% --the next most common reason rated 15.5%) was "spiritual or religious experiences" (4).

- 1. Reid WH, Dorr D, Walker JI, Bonner JW. <u>Unmasking The Psychopath</u>, New York: WW Norton & Company, 1986.
- Goleman D. "Brain defect tied to utter amorality of the psychopath," <u>The New York</u> <u>Times</u>, July 7, 1987.
- 3. Sargant W. <u>Battle For The Mind: A Physiology of Conversion and Brainwashing</u>, New York: Harper & Row, 1959.
- Goldstein MS, Jaffe DT, Sutherland C. "Physicians at a holistic medical conference: who and why?" <u>Health Values</u>, 10:3-13, Sept-October, 1986.

The Harm Caused By Quackery

<u>First of all. Do no harm.</u> One of the most quoted, yet poorly understood concepts, is the admonition of Hippocrates, "First of all, do no harm." This principle finds its roots in the <u>Code of Hammerabi</u> which held physicians responsible for harm done to the extent that they could be executed for killing a patient. The principle that a physician should do no harm never was intended to prevent surgical incision or the administration of drugs, but must be applied in a relative sense. No procedure should induce more risk to the patient than the risk posed by the condition itself if left to follow its natural course. Today, this is termed a "benefit/risk ratio." Only when the potential for benefit exceeds the potential for harm can a procedure by justifiable. A high risk procedure can be justified for a high risk disease while the same procedure, even if it has been approved by the FDA, cannot be justified for use on a low-risk condition.

The "harm" done by surgery, radiation and drug administration is commonly exploited by quacks who will claim that their treatments are less harsh or benign. Iatrogenesis and nosocomial infections are not limited to regular hospitals and health care. Quacks also induce iatrogenic diseases, and when such occurs, quack practitioners lack the evidence to justify having exposed patients to risk. When the probability of benefit equals zero; no amount of risk is justifiable.

Types of Harm Caused by Quackery.

The highwayman says, "Your money OR your life! Quacks say, "Your money AND your life!"

Economic harm. Whether something is economically harmful is relative to the resources of the victim. Interestingly, although the FDA recognizes economic harm, it rarely prosecutes promoters who only take people's money. The FDA is not concerned when only monetary loss is involved (1). This introduces a double-standard into law enforcement tantamount to declaring that it is all right to rob a bank as long as no one is shot. This enforcement policy is flawed for several reasons. Many low income people, particularly the elderly, spend a disproportionate amount of their limited resources on worthless health products and services. Waiting until someone's health is harmed before acting represents a "lock the barn after the horse is stolen" kind of thinking. There is often no way of knowing how much harm is caused due to delayed care or improper treatment by permitting quack promotions to compete with legitimate health care.

1. Budiansky. US News & World Report, p 69, December 8, 1986.

<u>Harm by Commission.</u> Direct harm results from what quacks do or get people to do to themselves. The overzealous use of vitamin-mineral supplements have caused dental erosion by excessive use of chewable vitamin C (1), birth defects caused by vitamin A megadoses during pregnancy (2); long-term, low level vitamin A poisoning (3); sensory neuropathy from vitamin B6 abuse (4); death by vitamin C poisoning in a genetically-susceptible patient (5); Vitamin D induced deafness (6); death by potassium overdose (7); selenium toxicity (8); adverse effects of zinc on HDL cholesterol (9); iron toxicity (10). [For a comprehensive review of the values and dangers of V/M supplements see Marshall. <u>Vitamins & Minerals. Help or Harm?</u>, Philadelphia: Stickley, 1983].

Herbs can be potent sources of poisonings and adverse reactions. Far from the benign "natural" medicines of folklore, herbs are the source of most preventable deaths in our society if one includes the herbs tobacco, cocaine, heroin, other abuse drugs. harm from the medicinal use of herbal substances include: death from Chinese herbal for arthritis (11); death due to misidentification while following health food store advice (12); death due to pennyroyal oil hepatotoxicity following herbal course in local college (13); anaphylaxis due to bee pollen ingestion (14); cyanide poisonings from apricot pits (15). [For a comprehensive review of the limited usefulness and inherent dangers of most popular herbal products see: Tyler. The New Honest Herbal, Philadelphia: Stickley, 1987].

Malnutrition and death by dietary abuses occur with disturbing frequency. These may be self-induced, or done to children by overzealous parents. Some starvation-related deaths have resulted from misguided weight loss programs such as the infamous "last Chance Diet (16).

Practices fostered by quackery that involve toxicities due to microorganisms include

infant botulism from honey (17), deaths by bacterial infection from certified raw milk (18), and fatal amebiasis from colonic irrigation (19).

Problems caused by scientifically-unfounded health care practices include harm due to unjustified amalgam removal (20); collapsed lung due to acupuncture needle insertion by a dentist (unpublished); death from excessive colonics causing electrolyte depletion (21); brain damage and death caused by full-body hyperthermia (22); stroke (23) and paralysis (24) following spinal Manipulation; and death caused by internal bleeding induced by naturopathic massage therapy in a leukemia patient (25).

1. JADA, 107:253-6, 1983. 2. Teratology, 33:355-64, 1986. 3. JAMA, 247:1317-18, 1982. 4. New Engl J. Med, 309:445, 1983. <u>Nutr Reviews</u>, 34:236-7, 1976.
 <u>Lancet</u>, p.985, 5/5/79. 7. JAMA, 240: 1978. 8. MMWR, 33:157, 1984. 9. JAMA, 244:1960, 1980. 10. New Engl J Med, 307:1702, 1982. 11. FDA Consumer, 2/84. 12. MMWR, 26:257 +, 1977 13. JAMA, 242:2873-4, 1979 14. J Med Assoc Alabama, 51:11, 6/82. 15. Amer J Clin Nutr, 32:1121-58, 1979. 16. Amer_J Clin Nutr, 39:695+, 1984. 17. Calif Morbidity, Rep.#23, 6/14/85. 18. Publ Health Rep, 103.489-93, 1988. 19. MMWR, 30:101, 1981. 20. ADA News, pp.1-3, 11/4/85. 21. JAMA, 244:1608-9, 1980. 22. Pepper. US House of Representatives, Comm. Pub. No.98-435, p.150, 1984.

23. Mayo Clin Proc, 55:322-32, 1980.

24. Paraplegia, 13:223-7, 1976.

25. Sacramento Bee, p.B-1, 9/11/80.

<u>Harm by Omission.</u> Indirect harm results when quacks convince people to avoid proper care. Insulin deprivation; delaying or avoiding effective cancer therapies; deprivation of epileptic medication; deaths by failure to immunize; avoidable caries due to absence or discontinuation of fluoridation; provide examples of harm by omission. Harm by omission is more difficult to establish because it is impossible to know what would have happened IF the patient had done something else. It is only possible to speak in terms of reasonable probabilities.

<u>Psychological Harm.</u> Whether by commission or omission, resultant harm is secondary to underlying beliefs and attitudes leading to the harmful behavior. Quackery involve more that simply selling false hope, it also works hard at undermining people's trust. In order to create a need for their "alternatives" quacks disparage regular food, water, health care, science, the regulatory agencies. public health, and health professionals. For instance, there is no justification for a "health foods" industry if supermarket foods are safe and healthful. Examination of the propaganda efforts by organized quackery reveals a constant attack upon conventional suppliers. Legitimate concerns such as environmental pollution are distorted to serve the interests of quackery. This helps explain why organized quackery has led the attack upon fluoridation for decades. The issue provides a forum for their message that "orthodoxy cannot be trusted."

<u>Harm to Society.</u> In a democracy, when large numbers of people believe nonsense, the effects can be far-reaching. Public policy decisions can be affected, research

misdirected, resources used unwisely, and attention diverted from society's real problems. Unfounded beliefs about the capacity of sugar to cause violent behavior reached into the courtroom in San Francisco's highly publicized murder trial of former city official Dan White. White's attorney managed to get his client a reduced sentence based upon the now infamous "Twinkie defense." The jury bought the notion that eating Twinkies could cause bizarre. uncontrollable behavior.

Some people believe that harm due to quackery is a rare event deserving very low priority. Supplement promoters claim that vitamin-mineral toxicities are highly unusual. Promoters of raw milk, herbals, colonics, spinal manipulative therapy, and so forth, cite highly publicized abuses of surgery and prescription drugs as relatively more a problem. Due to the lack of a reporting system, no one knows how many people are injured or killed due to quackery. One thing is certain, two wrongs do not make a right. Harm caused by quackery only adds to humanity's woes.

<u>Harm to Professionalism.</u> Quackery harms professionalism in at least two ways. First, by harm done to the profession when one of its members engages in quackery. Second, when the public becomes aware of quackery through channels outside of a profession, they may wonder why the organized profession failed to sound an alarm. Professionals have a consumer protection role to play through their organizations. The failure to fulfill that important role is apt to viewed with cynicism. Too many are willing to accept George Bernard Shaw's view that all professions are "conspiracies against the public."

Why People Become Victims

<u>The Gullibility Myth.</u> It is important to dispel the myth that victims are simply gullible. Gullibility is not only an inadequate explanation, but it perpetuates a cavalier societal attitude that leads to victim-blaming. Too often victims of quacks are regarded as fools impossible to protect from their folly. This results in placing a greater social stigma on the victims than the perpetrators of quackery even when criminality is involved (1). A major reason for the benign attitudes people usually display is that quacks are regraded as "so blatant and preposterous" that they are easily recognizable (2). Quacks are too often portrayed as comic opera folk heroes.

The term "gullible" is rooted in the same word used to name the sea gull--gullet-because this bird will <u>swallow almost anything</u>. Of course, some victims are gullible, but as a primary factor, gullibility is limited to the inexperienced (eg, the very young) and those incapable of learning by experience (eg, the mentally deficient). In fact, studies reveal that the victims of quackery are more apt to be above average educationally (3,4) and are apt to exhibit a strong internal locus of control. Individuals who are "shakers and movers," who don't take "no" for an answer. Personality characteristics that often lead to success in business, science and technology can get people killed if they are stricken with diseases that depend heavily upon prompt, proper medical management.

Misrepresenting victims as merely "gullible" does a disservice to those exploited by quackery and serves as an excuse to fulfill one's duty as a patient advocate. In reality, there may be little difference between the cooperative, compliant "good" patient of legitimate practitioners and those denounced as "gullible"--the latter simply trust the wrong doctor.

Victims are more often likely to be unsuspecting since most quacks are licensed health care providers, operating in the open with little effective regulation. Likewise, most quackery is advertised and publicized by way of the same mass media through which legitimate health information is dispensed. Some victims may seem gullible to those of us who possess special knowledge about science and health. Patients are generally ill-equipped to judge the ethics and ability of various licensed health care providers, and cannot be blamed for simply lacking special knowledge any more than a health professional can be blamed for not fully understanding how the stock market works. As Robert Morris stated:

Some of the most responsible doctors will always be in the hands of financial fakers, and some of the most responsible business men will always be in the hands of the medical fakers" (2).

- 1. Hunter and Roebuck, "The awareness of quackery as deviant behavior." J Health & Social Behavior, 13 (June):162-166, 1972.
- National Analysts. <u>A Study of Health Practices and Opinions</u>, Spring-field, VA: National Technical Information Service, US Dept of Commerce, 1972.
- 3. Cassileth, "Contemporary unorthodox treatments in cancer medicine," <u>Annals of Intern</u> <u>Med</u>, 101:105-12, 1984.
- Louis Harris and Associates. <u>Health, Information and the Use of Questionable Treatments:</u> <u>A Study of the American Public</u>, Washington, DC. U.S. Department of Health and Human Services, September, 1987.

Types of Victims.

Barrett (1) places victims of guackery into four categories:

- (1) gullible;
- (2) desperate;
- (3) alienated;
- (4) unsuspecting.

Barrett says that gullible people engage in immature magical thinking, which derives from a lack of experience. Barrett and I agree that most victims of quackery are merely unsuspecting. They believe that they are getting more consumer protection than they really are. It is the unsuspecting who are most likely to be helped by antiquackery efforts. The unsuspecting have only normal vulnerability to claims offering beauty, vigor, good health and longevity. They can be tricked, but they can also be educated.

Desperation drives people to behave irrationally and even self-destructively. The desperate are difficult to dissuade from quackery. They commonly employ the "gambler's fallacy" that there is nothing to lose from trying quack remedies. Of course, such behavior is understandable. People who have become desperate are vulnerable to being robbed of their life savings as well as what health they may have left. Such people are generally beyond protecting themselves and need the protection of the rest of the community --including the law enforcement when available.

People who are alienated automatically distrust conventional social institutions. These people are probably beyond help. Fanatics often fit into this category. Even when law enforcement drive quacks from the open marketplace, the alienated will seek them out in the underground.

1. Barrett, Nutr. Forum, 4:41, 1987.

2. Young JH. Bulletin of the New York Academy of Medicine, 51:(7):

Guilt. Guilt may drive a loved-one to press the sick person to "leave no stone unturned." In fact, there is much to lose by chasing quack remedies instead of
rational care or accepting reality. First, not all patients with serious disorders will die. Good management can do much to prolong life. Turning from rational therapy can deprive a patient of good management--and many there are many case of serious injury and death caused by patient mismanagement.

The Appeal of Quacks and Quackery

there is no mind more sensitive to the needs or fancies of society than that of the truly gifted con man" (1).

A cancer researcher who has carefully analyzed cancer quackery states. "it seems clear that the medical community must acquire the skills of the medical quack and combine these skill with his professional capabilities of effective diagnosis, prognosis and treatment" (2).

- 1. Holbrook. The Golden Age of Quackery, New York: Macmillan, 1959.
- Freireich. <u>Cancer Chemotherapy -- Fundamental Concepts and Recent Advances</u>, Yearbook Medical Publishers, Inc. 1975.

Fulfilling our desires. There are at least four main categories of human desire with perpetual appeal at which nostrums have always been aimed:

- (1) love potions;
- (2) fountains of youth;
- (3) panaceas;
- (4) super performance (physical and/or mental).

People <u>want to believe</u> that the quack's claims are true. The willingness to face hard realities takes more courage than some can muster. We must challenge people to have the courage to face and cope with reality.

<u>Self-Confidence.</u> If there is one quality that helps quacks to succeed in the face of evidence, reason, convention and common sense it is because of the self-confidence they exude. Legitimate health professionals must also be confident. Not to the point of the bravado quacks display, but more so than our scientific conservatism usually dictates. Bertrand Russell once said that the trouble with the world was that the ignorant are too full of confidence and the knowledgeable too full of doubt. It is an observation worth remembering when confronting quackery.

<u>Reassurance.</u> Patients need reassurance even if prognoses are bad. They need to be reassured that they will not be abandoned, that life will continue to have meaning, and that there will still be some joy in the future. McKeown points out that the tasks of clinical medicine are:

- (1) reassurance;
- (2) treatment of acute emergencies;
- (3) cure;
- (4) care;
- (5) comfort. (1)

Quacks easily can outperform regular physicians when it comes to reassurance. Care and comfort are more related to art than science and quacks should be able to provide these.

1. McKeown. The Role of Medicine, Princeton: Princeton University Press, 1979.

Peddlers of hope. Maple describes quackery's universal appeal by noting that.

"In the face of the Great Leveller. Death, we are all children listening fearfully for the footsteps of Doom relieved only by the whisperings of hope; the quack is the peddlar of hope" (1).

We need to see this insightful observation in its deeper psychological sense. It refers not only to the dying but to every person with the awareness that someday he or she will die. Any sign of aging, diminished performance or the speed at which time is passing reminds us of death. Even more mundane daily acts remind us that we are mortals (2). Failure and fears of failure, whether social, marital, athletic, economic, or whatever are symbolic "death events." The fear of not measuring up to expectation and the hope of gaining an edge against defeat is what drives many forms of advertising including guackery (3).

1 Maple. Magic. Medicine and Quackery, New York: Barnes, 1968.

- 2 Becker. The Denial of Death,
- 3. Packard. The Hidden Persuaders, New York: Pocket Books, 1969.

How Quackery Is Sold

<u>Deception.</u> Quacks are masters at deception. Fundamentally, deception involves creating an illusion that something exists when it does not, or that a reality is a falsehood. One of the significant ways quacks deceive their victims is by illusions created by distorting the meaning of language (ie, semantics).

Words mean exactly what I say they mean at the time I say them, nothing more, nothing less!"

Humpty Dumpty

The Semantics of Quackery.

When you pervert my words, you steal my mind." Edward E. Newman, Journalist

Health workers must be careful not to become ensnared by the semantics of quackery. Quacks distort terms to fit their own ends. They wish to create the illusion that their nostrums offer suitable choices for health consumers.

"Traditional vs nontraditional" medicine. It has become common practice to refer to regular medicine as "traditional" and quackery as "nontraditional" therapies. In reality, folk medicine is traditional medicine:

tradition: 1: The handing down of information, beliefs and customs by word of mouth or by example from one generation to another without written instruction; 2: an inherited pattern of thought or action (as a religious practice or social custom; 3: culutral continuity in social attitudes and institutions." (1)

The opposite of traditional medicine is modern, scientific medicine which is iconoclastic:

iconoclastic: "Tending to produce iconoclasm or overthrow what is established. . .(the influence of modern science)" (2)

Quacks apply "traditional" to biomedicine in order to imply that it is staid closedminded, authoritarian and elitist--established by tradition. In fact, most quackery can be traced to the same cultural concepts which underlie folk medicine, such as ayurvedic medicine, Chinese medicine, primitive New Age therapies, homeopathy. herbalism, and so forth.

"Orthodox" vs "unorthodox" medicine. Orthodox literally means "straight doctrine" (1). It is a term borrowed from religion where beliefs are supported by authority rather than scientific evidence. This suits the underdog image quacks wish to project of being the victims of an authoritarian power structure rather than promoters of schemes which fail to meet the basic standards of health science. "Conventional" is a synonym to orthodox implying a lack of innovation.

"Alternative" therapies. Modern health care offer many alternatives. People may take aspirin, Tylenol, Advil or any number of different types of pain relievers. All are safe and effective within specified limits. Also, arthritis, cancer, heart disease and other diseases may choose alternatives from various types of health care. Statistics are available on the safety and effectiveness of each alternative. Quacks employ the term "alternative therapies" in reference to techniques which have no record of safety and effectiveness. The only alternatives to proven safety and effectiveness are <u>unsafe</u>, ineffective, or <u>unproven</u>. Such are not true alternatives but the stock and trade of quackery.

<u>The "allopathic medical monopoly."</u> In the semantics of quackery, "alternative therapies" are defined as "alternatives to the so-called <u>allopathic medical monopoly</u>." Allopathy as a philosophically-based approach to healing is a relic of the prescientific past, however, nonscientific health care providers are fond of labeling regular medicine "allopathic" in an attempt to make their differences appear to be rooted in philosophy rather than a matter of demonstrated merit (see "Allopathy" in Part Two).

There is no medical monopoly in the true sense of the word. Hundreds of thousands of individual providers and centers compete with each other. To pose worthless and unproven therapies as a suitable competitor to legitimate health care is perverse. In fact, the legal theory of "unfair competition" can be raised against quackery because quacks engage in unfair marketing when they advance false claims that no responsible health care provider can honestly match. Antitrust law exempts scientific enterprises from prosecution when challenged by pseudosciences.

- 1. Webster's New Collegiate Dictionary, 1976.
- 2. <u>Webster's 3rd New International Dictionary, Unabridged</u>. Chicago: Encyclopedia Britannica, 1976.

Tricks Used in Selling

Selling involves a process that begins with creating awareness, willingness to "give it a try," and eventually, adoption. The process of accepting a proposition is dependent upon the following steps:

- (1) get the individual's attention;
- (2) acceptance of the idea as plausible;
- (3) acceptance of faulty validation;
- (4) try it, you'll like it;
- (5) acceptance of faulty self-validation that it "works."

After adoption, a next step may be <u>advocacy</u>. The most effective way this has been accomplished is through multilevel marketing schemes where the new convert is

tempted with easy wealth, bolstered by a sense of helping his fellow man.

<u>Getting attention</u>. First, quacks must get people's attention. This is where quackery's entertainment aspect is seen.

<u>Plausibility.</u> Once quacks have your attention, they must overcome a natural initial skepticism just about every normal person possesses. The objective is now to make their idea seem <u>plausible</u>. Acceptance of an idea as at least being plausible is the key to moving someone to accept the proposition. Do not confuse "plausible" with "possible"; most people are willing to admit that almost anything is possible, but plausibility means "worthy of belief." This may be accomplished by mixing common sense with nonsense, quoting "authorities", celebrity endorsements and so forth.

<u>Faulty validation</u>. After persuading people the quack method is plausible the next step is to get him or her to accept faulty validating evidence. Testimonials and unsubstantiated claims can accomplish this. The personal message "it works for me!" has great appeal. An early FDA official, stated that

the perfect testimonial [for quackery] must have the appearance of truth and be acceptable to those who from lack of special knowledge are unable to detect any fallacy that may be present." (1)

This "lack of special knowledge includes both ignorance (what isn't known) and misinformation (what is misbelieved). The willingness to accept faulty methods as validation of safety and/or effectiveness is a trait shared by both quacks and their victims. This process includes cultivation of the human "will to believe." Encouraging and exploitation of the human will to believe rather than the skepticism of Zetetics (ie. truth-seekers) which teaches open-mindedness coupled with the demand of solid evidence for claims.

Deceptive tactics used by quacks to encourage faulty self-validation include:

(1) <u>Double Talk.</u> "Cancer cannot be cured, but the patient can." This is ridiculous. In the psychology of deception this can be called "slight-of-mind," or "sleight-ofmouth," as one of my magician friends prefers. Obviously, if you can cure the patient, you must do something to rid him of his disease. Here's another example: "We can't choose when we die, but we can choose how long we live." Illogical. But its the kind of illogic that is the stock and trade of "mind cure" quackery.

(2) <u>Faked testimonials.</u> A Colorado chiropractic hospital once offered a "guaranteed cure." Hospital publications claimed that a Mr. Parsons of California had been cured of lung cancer. It quotes the man as saying, "Boy, am I glad the way things turned out." But in court his wife testified that his treatments "did no good" and that Parsons "felt worse when he came back than when he arrived at that institution," and that he had died soon after the date of his alleged testimonial (2).

(3) <u>Weasel words.</u> Another selling trick is the use of what are known as "weasel words" in advertising jargon. These create the illusion that a promise is being made to buyers but permit the advertiser to "weasel" out of the deal later (3). For instance, the rationale for glandular supplements provided by a laboratory that supplies chiropractors states:

The function of. . . Laboratories Glandular supplements is to <u>assist</u> the body's own glands to <u>help</u> maintain their proper function. These glandular concentrates <u>reportedly</u> go directly to the aid of the gland of the

same name. . .liver to liver, eye to eye, prostate to prostate and so forth. Theoretically, the nutrients found in glands may contain essential factors and when taken as a supplement, will help the body's glands reach and maintain proper functioning levels."

Six weasel words are underlined which add up to a promise of nothing--despite the illusion that these products have usefulness.

- Young. The Medical Messiahs, Princeton, Princeton Univ. Press, 1967
- Smith. <u>At Your Own Risk</u>, New York: Pocket Books. 1970
 Wrighter. <u>I Can Sell You Anything</u>, New York: Ballantine Books.

Quackery and the Mass Media.

Mass media technology offers promoters a highly efficient means for spreading misinformation. This is accomplished in many ways.

Hidden advertising. The First Amendment right to free speech does not fully extend to commercial language such as labeling and advertising. Promoters of guackery attempt to bypass consumer protection laws by making their claims within editorial comments or planted "news" articles. The following ad which appeared in a major advertising magazine is enlightening on how the process often works:

- HEADLINE: "Family Circle readers have emptied the shelves of lecithin, kelp, vitamin B6 and apple cider vinegar."
- BYLINE: "Imagine what they'll buy from you!"
- MESSAGE: "The Family Circle editorial. It's an action-getter - a whole agenda of things to do, ways to do them, and sometimes even the tools to do them with. The Family Circle reader action upon that editorial with response that reaches clear to the advertiser and retailer.

The article, "My Amazing Cider Vinegar, Lecithin, Kelp, B-6 Diet" in the January issue of Family Circle helped empty the shelves of health food stores across the country. . .' (1)

A more elaborate example of deceptive media manipulation by promoters involved an orchestrated scheme to make evening primrose oil (EPO) appear to be a scientific breakthrough. A major health food chain conspired with a writer to produce a book on the benefits of EPO placed news releases in magazines and newspapers, made talk show appearances, produced a booklet called a "health guide" and arranged to have articles released by two major tabloids that would coincide with advertisements the company had placed. Memoranda were sent to sales managers to inform everyone in their stores about the product. Editorial comments touted EPO for a wide range of conditions including reduction of blood pressure, treatment of multiple sclerosis, manic depressive psychosis, alcoholism, acne, arthritis, obesity, menstrual problems, and that it lowered risk of heart attack. (2)

Case. The media has been guilty of publicizing clinics which traffic in dubious remedies by inadequate investigative reporting. For instance, when actor Steve McQueen sought cancer cure from delicensed orthodontist, William Donald Kelley, Newsweek ran a story stating that Kelley's main qualification was that he had cured himself of cancer.

"The 55-year-old Kelley discovered his treatment when he developed cancer of the liver and pancreas himself in 1965. Given only two months to live. Kelley says he recalled his nutrition courses in dental school and began devouring huge quantities of liver, taking pancreatic enzymes and using coffee enemas to "detoxify" himself. He claims the tumors disappeared." (3)

Anyone taking the time to read Kelley's silly book <u>One Answer To Cancer</u> will discover that he diagnosed his "pancreatic cancer" by a test he invented himself (which he alleged also predicted how much longer he had to live), and then cured himself--and his wife. children and mother-of cancer by his own therapeutic regimen. In my opinion, presenting Kelley's story without revealing the groundless basis for his claim to self-cure was irresponsible journalism.

Whatever the media publicizes will be capitalized upon by quacks. For example, when interferon was given a lot of publicity as a hopeful cancer breakthrough, in a short time people could purchase "super-interferon" in Tijuana. We must accept that the mass media is exploited by quacks just as they do other aspects of society.

- 1. Media Decisions, circa 1975).
- 2. Grand Jury indictment, The United States of America vs. General Nutrition, Incorporated,
 - et al., U.S. Western District of New York Court, January, 1984.
- 3. Newsweek, October, 20, 1980.

Clinical Gimmicks.

Quackery can delude those in good health into thinking they are ill, and those in poor health into thinking they are getting well. (Larson, First National Congress on Medical Quackery, 1961)

Deceptive practices are performed in the clinical setting which make patients believe that something real is happening. Successful clinical medicine involves a good deal of psychology. The important message of learning about the psychology of the clinical gimmicks is the fact that the patients have no information on the nature of his disease and must rely entirely upon the practitioner to provide such information. This requirement of trust on the part of the patient and trustworthiness on the part of the practitioner is foundation of responsible health care.

"Success schools" that teach deceptive practices. Among the most significant discoveries made during more than twenty years of studying quackery has been the practice management "success schools" operated by chiropractors. These are slick courses with manuals that teach systematic and deliberate deception. Incredible as it sounds, it includes both self-deception of the DC as well as psychological manipulation of their patients.

<u>Self-Deception.</u> Personal self-deception begins with a deluded self-concept. <u>To</u> <u>become, ACT AS IF!</u> To become a millionaire, "THINK, ACT AND FEEL LIKE A MILLIONAIRE!" (emphasis theirs). "Sleep in the biggest bed imaginable"; "Buy the biggest or best wash cloth, towel, soap, razor, tooth brush, and/or shaving lotion available."; "Spread dollars worth of change in all the places you look daily...put a \$100 bill in your billfold...Let this system remind you that everywhere you turn that you are becoming a millionaire." Clinical self-deception is expressed by stating, "Seeing is not believing, believing is seeing!" says the manual. This is another way of pointing out an important clinical pitfall that scientists attempt to avoid by using double-blind methods of observation. Observers do selectively observe by both "seeing what they want to see," and "seeing what they are looking for."

<u>Taking Control of the situation.</u> "First request, then command," the manual advises. Take control of the situation. "Dominate, but don't domineer," the manual states. Learn to control patients with a spirit of love. "Lather Love Lavishly" the manual repeats again and again.

<u>The Invented Disease.</u> The invented disease" is a gimmick that allows practitioners to convince patients they are ill either on the basis of general symptoms most normal people exhibit from time to time, or some spurious "test" in the case of symptomless diseases such as hypertension, heart disease or cancer.

<u>Case.</u> Three dental practitioners were taken in by a scam involving a black box promoted by an Idaho naturopath who diagnoses cancer using a saliva test. After determining that the patient has cancer, he would say, "don't worry, I can cure you, but you must keep quiet about it lest the AMA and FDA find out. My device would destroy the multibillion dollar cancer treatment industry." The box was rented to patients for \$50 per month. Once-a-week the patient sends in a saliva sample by mail. The naturopath would write back directing the patient on how to set the pins in numbered holes.

One of the devices was obtain when the mother of a dental faculty member brought it to town. An examination found that the device had an electric plug with a wire leading to a light indicating that the power is on. From there one strand of the wire was clipped off. The other strand exited and had an alligator clamp which was attached to a piece of screen material that the patient holds next to their "cancer." The numbered holes with the pin-settings were entirely separate from the electrical circuit like pegs in a cribbage board. Moving them around cannot possible have an affect on the device. This gimmickry permitted the naturopath to convince people they have cancer and that he could cure them.

<u>The One-sided Coin.</u> Foot Reflexology alleges that reflex points to each of the body's organs have been superimposed on the human foot. The same technique is done in iridology by superimposing organs on the iris; also in auricular acupuncture the organs are superimposed on the ear. The psychology is the same in all of these. As these instructions from the "how to" manual direct as the reflexologist probes the foot: "...look for constrictions, or the places where the person feels pain or says 'ouch'; check the accompanying charts to determine what body part corresponds to the sore part of the foot. Tell your friend that he either has a problem in that organ or a strong potential for one." This represents a "heads I win, tails you lose" proposition. The system cannot fail under these circumstances.

<u>Taking Credit.</u> The clinician may knowingly or unwittingly take credit for improvements which are part of the normal ups and downs that occur during the natural history of a disease process. Emil Freireich, a cancer specialist at M.D. Anderson Cancer Center came up with a tongue-in-cheek scenario he dubbed the "Freireich Experimental Plan." He states that any type of procedure will do (ie, drug, device, procedure. regimen, ritual) as long as it meets the first requirement is of inherent harmlessness. Freireich points out that both acute and chronic diseases have ups and downs, but long-term disease especially have periods when the afflicted appear quite well. Dr Freireich notes that clinicians can always come up with reasonable rationale for patients' responses. If patient is better: "Aha, its working." If patient is worse: "More time or a higher dose is needed." If patient is stable: "It's working, but more may be needed." If patient dies: "He came too late, was beyond hope." Of course, any of these may be true, but only controlled studies can reveal if one is true; otherwise, they are simply post hoc clinical excuses.

<u>The "Yet" Disease.</u> Many patients go to DCs for bursitis, a condition for which manipulation--and most other therapies--are ineffective. Rather than telling the patient the truth, that only time will heal the condition, the DC is advised to employ the clever "yet" disease ploy.

DC to patient: "Has the condition reached the <u>other shoulder yet</u>? Patient: "No, the other shoulder is fine." DC: "Good, these problems often spread," (untrue); "we're going to do our best to keep it there in the one shoulder."

After months of treatment, the condition is not better, but it never did reach the other shoulder, satisfying the patient that the treatments did some good.

"What's better?" The manual advises: "Ask the patient, what's better? If the patient states that nothing is better, and restates his trouble, say: 'but the adjustment took so well yesterday some improvement should have been noticed, think hard now, isn't something better? 'If patient tells of conditions that are better, say, 'wonderful,' great,' good for you!'"

<u>The Power of Suggestion.</u> The "What's better?" ploy is continued with the addition of the power of suggestion. With each successive visit the DC is advised to greet the patient with suggestive, encouraging remarks. "your eyes are brighter"; "You're getting a spring in your step"; "I hope you're feeling as good as you look!"; "Did you know that you will live longer and have fewer colds as a result of these adjustments?"

<u>Avoiding Blame.</u> Among the most despicable ploys taught by the manual are those designed for patients who have "become discouraged." Some tactics presented were:

A. Emphatically declare that the spine (cause) is better.

B. Remind him that "... at one time he did feel better (if he did) so your adjustments must be doing some good..."

C. "What would you do if you quit?" Patients usually have no alternative treatment.

D. Reaction: "New life is going into the nerves supplying the affected organs which have been causing your suffering. Thus, this upsetting condition is actually a blessing in disguise."

These deceptive tactics are justified in a typical "true believer" style as necessary to keep patients coming back for spinal adjustments based upon the DC's blind faith that popping the spine will enable the Innate Life Force to flow more freely thus enhancing the body's self-healing capabilities. These tactics illustrate how crucial are the interplay of patient trust and practitioner trustworthiness in the clinical setting.

<u>Assigning blame.</u> Cancer quacks like to pass blame for failures off to conventional therapies. They use the strident terms "cut, burn and poison" for surgery, radiation and chemotherapy. Surgery "spreads the cancer, so don't have a biopsy," they say.

Radiation and chemotherapy "knock out the immune system" and that's why the dubious treatment didn't work. The promoters of Macrobiotics claim that a tumor is a "natural mechanism" that localizes the toxic condition and detoxifies the body, therefore, the tumor should not be disturbed.

Handling the Opposition.

Quackery is far more actively at war with science than. Regular health professionals tend to regard quacks as nuisances who are not really worthy of their attention, time and effort; but quacks have to regard regular medicine as its major opponent. In order to convince people to buy their "alternatives" they must first undermine confidence in regular health care.

<u>Anti-intellectualism.</u> "Scientists believe that bumblebees cannot fly!" This popular bit of anti-intellectual folklore is often used to falsely portray scientists as so theoretical that they cannot recognize the obvious. According to legend, a group of scientists got together and decided that bumblebees should not be able to fly because their bodies were so big in comparison to the small size of their wings. In reality, no such belief has ever been held by aeronautical engineers. That this was a wisecrack invented to antagonize aeronautical engineers. In fact, in 1942, engineers at Northrup got so tired of hearing this myth from salesmen that they undertook a voluntary project during their work breaks in which they captured bumblebees, measured and analyzed their flight mechanisms and wrote their findings up, including the formulas whereby bumblebees take-off and maintain flight, in an article which appeared in <u>Collier's</u> magazine (1). Exploiting this type of folklore is commonly done by quacks to undermine confidence in science.

1. Marshall. "Justice for the bumblebee, Colliers, p.34, July 7, 1945.

<u>The Galileo ploy.</u> Quacks will say, "They persecuted Galileo, Semmelweis, Jenner, and all of the great innovators who were ahead of their time." The struggle of early scientists is part of our history, however, if you examine the facts in these cases, you will find several important differences between them and today's quacks. First, the world was far more authoritarian then. The Church or other philosophical hierarchies were in charge and it was difficult to receive a hearing.

Further, none of the great men of science cited by today's advocates of quackery behaved as quacks. They did not promote unproven methods in the health marketplace. They petitioned for an opportunity to demonstrate their methods before their peers.

Today, the scientific process dominates and there are many forums where a person can receive a hearing and demonstrate the usefulness of their methods. True scientists expect opposition to their theories and observations. The scientific arena is a crucible of critical analysis, peer review and debate which helps serious investigators refine their methodology and ultimately aid in the process of proof. It often takes drive and a strong ego to continue in pursuit of an idea, but true scientists don't object to constructive criticism and don't label such to be "persecution." Demonstration of safety and effectiveness for an intended purpose is all that is asked of the promoters of dubious treatments, but they do not response with evidence but, with philosophical rhetoric.

<u>"You must remain open-minded."</u> This is the ploy that sends many scientists scurrying for cover. The saw goes like this: "The mind is like a parachute, it works best when opened." Of course, the scientific process is one of constant searching, of open-mindedness; but, when it comes to application of therapies for sick people, we have

responsibilities. Included is the responsibility to speak out when the public is being abused in an area where we have special knowledge. We can remain open-minded and willing to test new ideas, but we cannot remain closed-mouthed in the face of our duty to warn the public about quackery.

The Conspiracy Ploy. Quacks also exploit the dark side of human nature. An inherent paranoia exists in many people: an irrational fear and the willingness to believe the worst about those in positions of trust. A recent study (28) revealed that 29% of Americans believe that there is a conspiracy to withhold medical advances from the public. Extremist publications in the U.S. claim that AIDS came about due to a World Health Organization vaccination program that went awry (some even charge that this was a deliberate act!). Quacks have always used ideas of sinister plots against humanity to sell themselves as saviors. Modern agriculture, fluoridation, immunization, pasteurization, food technology -- with the notable exception of dietary supplements which have become a major source of income for nutrition quacks -- are the targets of fear-mongering by anti-science factions.

The conspiracy ploy can be refuted by pointing out that such would be:

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(1) Self-destructive. Doctors, researchers, and their loved-ones all are susceptible to and die from the same diseases as the rest of the population. Only a madman would participate in a conspiracy to withhold a medical advance; and, while science is by an occasional madman it would take thousands of madmen all over the world.

(2) Bad business. It would make no sense to withhold cures. Patients would die or become dissatisfied and not return. A more logical conspiracy would be to sell patients on a lifetime of dependency.

(3) Unprecedented. There has never been a case in history where a major medical advance was deliberately withheld from the public. Recall the triumph over polio and enormous economic impact it had on health care. No one in medicine was sorry to that scourge ended.

(4) Impossible. It would be impossible for any one nation to engage in such a conspiracy. Japan, Russia, China, the European countries are all working toward medical cures. Many of these are in competition for the honor and wealth that accompanies medical advances.

<u>Regular medicine has its victims too.</u> Due to the fact medicine is self-critical and works in the open, proponents of quackery can easily find grist for their mills. Quacks work in seclusion and selectively affirm their practices. A fair comparison statistically is impossible under such circumstances. The sad fact is that harm that results from quack therapies is almost invariably unnecessary and avoidable. Employing a risk/benefit equation to worthless or unproven methods exposes their lack of value.

Legal Intimidation. Quacks engaged in well-organized commercial enterprises may threaten legal action against their detractors. Such threats can be alarming and intimidating. Never-the-less, this need not deter responsible health professionals from opposing quackery. A practical guide to avoiding legal problems when confronting quackery is provided in the appendices.

<u>"Health Freedom."</u> Freedom of choice arguments take the form of "health freedom," meaning that patients should be free to choose whatever therapies they wish. Organized quackery made more political gains through the use of freedom of choice

arguments than any other tactic it has ever employed. Its often linked to the antiregulatory climate of recent years in other sectors of the economy.

The "health freedom" argument is an example of classical deception by misdirection. It focuses on the patient by offering to "give the dying man his last request." The reality is that patients may freely choose to:

- (1) refuse treatment;
- (2) self-treat with vitamins, apricot pits or anything they wish;
- (3) seek out quacks.

What patients may not do legally is become quacks themselves by selling their dubious remedies in the marketplace. The reason patients clamor for dubious treatments is because they have been deceived into believing that these offer hope. By focusing attention on the patients, the deceivers misdirect attention from themselves. In reality, the people clamoring for health freedom are mainly promoters of dubious remedies and people their disciples. No legitimate consumer organizations are working to undo consumer protection laws.

There are organized movements to repeal consumer protection laws. Probably the most politically active is the National Health Federation. It fights not only rational cancer therapy but promotes raw milk, condemns fluoridation, immunization and other scientific public health procedures. It attacks the government regulatory agencies referring to them as a kind of "gestapo" and attacks regular medicine as some kind of "monopoly." Its main publication is named <u>The Health Freedom News</u> and carries out a regular attack on science and consumer protection. The NHF takes up causes that challenge the exercise of governmental power to enforce rational health care practices.

<u>Cases.</u> An example of a proud moments for the anti-consumer protection advocates was when Karen Ziegler, a 13-year-old girl taken from the custody of a child-protection agency by a lower court judge in Nevada and returned to her parents and those who wished to treat her with dubious cancer treatments. NHF proclaims the decision as "a victory for freedom of choice" (1) but it is clear that it was no victory for her because she died within months of her potentially curable Hodgkin's disease (2). The same happened in the case of Joey Hofbauer of New York. NHF intervened in the court case and declared "Joey Wins!" in their headlines (3). For months they issued periodic reports of progress for Joey, but in the end he died in a Bahamas clinic that promotes dubious cancer treatments (4).

Most embarrassing to organized quackery was the case of Chad Green, the little boy who achieved national attention when his misguided parents fied the Commonwealth of Massachusetts following a court order that the child should receive proper cancer therapy instead of laetrile. Chad was pictured on the cover of the November, 1979 <u>National Health Federation</u> <u>Bulletin</u> with the caption: "Chad's Mom says he's off chemotherapy -Look at him!" Chad looks like a normal child in the picture which ostensibly is proof that laetrile is working. The problem for the laetrile promoters was that little Chad had died of leukemia in October, 1979! The reason his picture appeared on the magazine one month later is that the publication had been pre-dated so it would appear timely. Just three weeks after the picture of Chad was taken to prove that he was healthy, he died. Cancer patients often can look perfectly well even up to the last stages of their diseases which allows quacks to take undeserved credit for alleged "cures."

The "health freedom" argument is a wolf in sheep's clothing. It harkens us to a bit of Biblical admonition found in Matthew 7:15-16: "Beware of...men who come to you dressed up as sheep while underneath they are savage wolves. You will recognize them by the fruits they bear." The fruits of the "health freedom" argument has been the unnecessary deaths of children with cancer and a variety of other cases of poisoning, starvation and other suffering.

- 1. Clark. Health Freedom News, June, 1984.
- 2. Clark. San Diego Union, p.A1, 12/27 84
- 3. Public Scrutiny, June, 1978.
- 4. Medical World News, p. 31, 8/18/80.

"Medical Freedom." "Medical freedom" means that practitioners should be able to prescribe any treatment that they and their patients agree is worth trying.

A doctor should be free to inject manure into his patient's veins if he and his patient agree upon it. John Morrone, MD, laetrile advocate.

This proposition fails to recognize that the doctor-patient relationship is unequal. When doctors and patients "decide," the doctor wields excessive influence. This is especially true of mavericks and fringe practitioners who commonly dominate their patients. The notion of medical freedom presupposes that doctors are always sane, honest, rational, and completely trustworthy. Many physicians are impaired for one reason or another. To be enabled to practice medicine is a privilege, not a right. It is a privilege that should be granted only to those in society who are competent and trustworthy. Both arguments are transparent attempts of quacks to escape accountability. They would like to repeal the antifraud laws that protect consumers from exploitation.

[For more information on the anti-consumer protection activities of the National Health Federation see <u>The</u> <u>Unhealthy Alliance: Crusaders for "health Freedom,</u>" A special report by the American Council on Science and Health, 1988. Available from ACSH, 1995 Broadway, 18th Floor, New York, NY 10023.]

"Science doesn't have all of the answers." The fact is that science doesn't claim to have all of the answers. It is quackery that pretends to be able to answer the questions science cannot. Further, science is not an answer-book; rather, it is a rational and responsible process by which some answers can be determined. In the health marketplace, the real questions involve safety and effectiveness--these can and should be answered scientifically.

Even the quacks feign safety and effectiveness. For safety they offer words such as "natural," "organic," "holistic," "non-toxic," and other illusions. For effectiveness, they offer anecdotal testimonials and unsubstantiated claims. What they never offer is appropriate evidence for either. Quacks wish to be accepted on the basis of faith in their stated good intentions. However, they also wish to have the consumer protection laws set aside which would hold them accountable for misbehavior.

Quackery and Society

Public Attitudes. Public attitudes toward quacks and quackery are summarized in the following exchange:

Sam: "Which is worse, Bob, public ignorance or apathy about guackery?"

Bob: "I don't know and I don't care!

Ignorance and apathy sum up the general views about quackery. Of these, apathy is the worst because once people motivated they will attain the needed knowledge. The reality is that ignorance and apathy overlap. Ignorance about the true nature of quackery, quacks and victims produces the apathy about these problems that pervades society.

"Ignorance" about quackery. Reference here is to ignorance in a broad sense. Ignorance, per se, is "not knowing" as compared to misinformation in which one holds a misconception about a thing, or misbelief in which the misconception is held with strong feelings. Which of these a person holds is an individual matter, but the nature of ignorance about quackery has been documented.

Misconception #1.

Quackery is easily recognized. A national study for the United States Food and Drug Administration on health beliefs and practices found that "popular portrayals of 'quacks' as objects of humor lead many people to believe that they are always so blatantly weird, preposterous, or hucksterish that quackery is easily recognizable." (A Study of Health Practices and Opinions, Springfield, VA: National Technical Information Service, U.S. Department of Commerce. PB-210 978. June, 1972.)

Misconception #2.

Quackery is clearly defined in the public's mind. Criminologists who studied quackery found that "the public lacks a uniform and consistent knowledge about spurious nostrums, devices, and treatments. In short, there appears to be no well formulated, promulgated, or accepted normative structure operating as a guideline within this area of deviancy." (Roebuck JB, Hunter B. "The awareness of health-care quackery as deviant behavior," J. Health & Social Behavior, 13:162-166, 1972)

Public perceptions of both health fraud and quackery mix actions (selling, distributing, advertising false, untested or unproved products/services), motivation (greed), and character judgments (deceivers, liars). The public rightly perceives quackery as promoting untested/unproved remedies as well as those known to be false. Only one perception, "overcharge for proven treatments/service, seems to be completely off the mark. Although an undesirable feature, such a practice does not fit any standard definition of quackery.

A study which asked subjects to describe in their own words what "health fraud" and "quackery" meant to them found that many elements were held in-common between the two terms, but some distinct differences existed when the frequency of response was taken into account (see Table 3.)

Apathy about quackery. Cavalier attitudes toward quackery are exhibited by a substantial portion of the public, many health professionals, law enforcement officials and the courts. Although a majority of the public reject the idea that quackery is "worth a try" for a sick person, there is a substantial minority who apparently do not understand why this is so, or distrust the medical profession suspecting it of conspiring to hold back effective cures (see table 4.). It is encouraging to know that a substantial portion of the public hold rational beliefs concerning quackery and its potential for harm. Educational efforts can build upon this foundation of sound beliefs.

Table 3.

Public Perceptions of "health fraud" and "quackery"

Sub	pective Definitions of "Health Fraud"	N	Percent
1.	Sell/distribute products which are ineffective	182	28
2.	Advertising product which is ineffective	103	16
3.	Falsely claiming ability to cure disease	86	13
4.	Selling/distributing untested/unproved product	57	9
5.	Practicing medicine for profit only	57	9
6.	False advertisement/claim related to product/service	44	7
7.	Deceit/untruthfulness (unspecified)	42	7
8.	Give treatment which is ineffective	41	6
9.	Prescribe treatment which is not needed/unnecessary	37	6
10.	Overcharge for (proven) treatments/service	26	4

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Subjective_Definitions_of "Quackery"		<u>N</u>	Percent
1.	Practicing medicine without proper training	203	32
2.	Sell/distribute products which are ineffective	84	13
3.	Falsely claiming ability to cure disease problem	82	13
4.	Deceit/untruthfulness (unspecified)	55	9
5.	Give treatment which is ineffective	49	8
6.	Selling and distributing untested/unproven product	48	7
7.	Practicing medicine for profit only	43	7
8.	Give treatment which has not been tested/proven	34	5
9.	False advertisement/claim related to product/service	29	5
10.	Advertising product which is ineffective	23	4

(Morris LA, Gregory JD, Klimberg R. "Focusing an advertising campaign to combat medical quackery," J Pharmaceutical Marketing & Management, 2:(1):83-96, 1987.)

Table 4.

PUBLIC ATTITUDES TOWARD QUACKERY

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	AGREE		DISAGREE	
Quackery causes harm One of the worst things about quackery is that it:	<u>strongly</u>	<u>somewhat</u>	somewhat s	trongly
delays people seeking legitimate care	74%	21%	4%	1%
causes people to avoid seeking legitimate care	70	25	5	1
costs people needless penditures of money	80	18	2	1
causes direct physical injury to people I Beliefs about quackery	29	47	22	3
There is nothing wrong with a sick person trying any product or service	3	15	29	53
There is a conspiracy among the medical profession to hold back truly effective cures	10	20	27	53
Any kind of claimed cure is worth a try	6	14	35	50
Many people are helped by unproven products or services	3	42	30	26
Sometimes sick people get better even when they are taking worthless medications	24	60	7	9
Only fools get taken by quacks	4	16	·3 9	41
The poor are more likely to purchase quack products/service	29 s	38	23	10
The government does not permit unproven treatments to be advertised	10	16	37	37
Publishers and broadcasters should not accept advertising for unproven medical products or services	70	19	6	5

(Morris, Gregory, Klimberg, 1987).

Coping with Dubious Dentistry

It can be perplexing when a professional encounters a colleague who is engaging in dubious dentistry. Improper practices generally involve either exceeding the scope of practices of dentistry, or promoting questionable methods. A guiding principle for evaluating the legitimacy of procedures is whether or not the techniques are taught in the regular curricula (excluding continuing education) of accredited dental schools. If a problem arises in which a colleague appears to be engaging in dubious practices, a course of action which may be followed is to:

(1) Gather information. Obtaining an accurate picture of what is being done is The purpose of gathering information is to get a clear picture of precisely what is being done. The aim is not to "catch" someone acting improperly, but to be fair and be able to present an honest picture. One's state of mind should be focused upon description, not indictment. Documentation is essential. Keep a diary. Memory is faulty, detailed personal observations should be recorded. Do not embellish, but be as fair and objective as possible.

(2) Discuss your concerns confidentially with someone you can trust. Seek someone in the profession with experience, insight and wisdom. Get advice on the local politics. Don't act until you have someone who will back your veracity.

(3) If possible, discuss the matter with the person in question. If personalities permit, discuss your concerns with the person(s) whose behavior is in question, but only after you have what you believe is a substantive picture of being done.

(4) Report your findings to the appropriate agency. This may be the local dental society or the state board of dental examiners. In some cases, it may be necessary to report activities to a board which governs an area into which a practitioner is illegally encroaching (eg, the licensing board for medicine, nutrition (if one exists), FDA, or District Attorney (in cases of fraud).

(5) Disassociate yourself professionally from anyone engaging in illegal activities or unprofessional conduct.

Fighting quackery is both a moral and a legal responsibility. Health professionals have a legal responsibility to alert the authorities and warn the public when they become aware of dangers that exist within their areas of special expertise. In a case filed in 1989 against an Ohio surgeon known as "the love surgeon" the principle of a health professional's duty to warn is being put to the test. Dr. James Burt, a Dayton, Ohio, obstetrician-gynecologist did experimental surgery on hundreds of women with and without their consent over 22 years. Presumably his surgical procedure was designed to enhance their sexual experience, but it disfigured the women and caused extreme pain and other significant medical problems. It was well known that Burt was performing these questionable procedures--he even wrote a vanity book in 1975 titled Surgery of Love. The local medical community did not condone Burt's practices--the dean of the local medical school called his procedure "medically unfounded" in a report to the medical society--but did no try to stop his practices. Burt was finally forced to resign his medical license in 1989 under pressure from the Governor of Ohio and the Ohio Medical Board. The hospital in which Burt practiced, the medical society and individual physicians who knew of his malpractices were named in the lawsuit for failing to report Burt's improper conduct. (Wachsman H. <u>NY Times</u>, "Doctors who maim and kill," August 25, 1989). A true professional should be willing to act out of a sense of ethics when the conduct of a colleague violates the sacred trust which forms the basis of professionalism within the domain of health care.

QUESTIONS

- 1. The organization that determined that quackery is the number one harmful fraud directed against the elderly was the:
 - a. National Council Against Health Fraud, Inc.
 - b. U.S. House of Representatives Committee on Aging & Long-term Care.
 - c. U.S. Senate Committee on Aging
 - d. U.S. Food & Drug Administration
- 2. The word that best represents the essence of quackery is:
 - a. fraud
 - b. imposture
 - c. greed
 - d. promotion
- 3. Caveat vendor (let the seller beware) is founded upon:
 - a. the presumption of equality between buyer and seller.
 - b. the presumption of inequality between buyer and seller.
 - c. proof that fraud has been perpetrated.
 - d. whether or not a guarantee was given.
- 4. A health professional may turn to quackery due to:
 - a. personality disorder.
 - b. following a psychologically shattering experience.
 - c. egomania
 - d. all of the above
- 5. Harm done due to quackery is:
 - a. no worse than iatrogenic diseases of regular health care.
 - b. not justifiable because no probable benefit is evident.
 - c. sometimes justifiable on a benefit/risk evaluation.
 - d. impossible to compare with that of regular health care.
- 6. The primary harm done by quackery is:
 - a. undermining trust in regular health care.
 - b. taking money under false pretenses.
 - c. direct injury inflicted upon consumers.
 - d. delaying proper care.
- According to Barrett, most victims of quackery may be classified as: a. gullible
 - b. desperate
 - c. unsuspecting
 - d. alienated
- 8. The outstanding quality that helps quacks succeed is their:
 - a. charm
 - b. persuasiveness
 - c. empathy
 - d. apparent self-confidence

- 9. The term "traditional medicine" more accurately describes:
 - a. modern biomedicine
 - b. folk medicine
 - c. pseudomedicine
 - d. future medicine
- 10. The key feature to getting someone to accept a proposition is:
 - a. getting attention
 - b. acceptance that the idea is plausible.
 - c. faulty validation
 - d. authoritative endorsement
- 11. The main lesson to be learned from studying the clinical gimmicks taught by the chiropractic "success schools" is:

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- a. the importance of trustworthiness on the part of providers.
- b. the fact that patients are at the mercy of clinicians.
- c. the need for licensing boards to maintain the quality of practitioners.
- d. all of the above.
- 12. The main goal when coping with dubious dentistry among colleagues is:
 - a. get a accurate description of what is being done.
 - b. stop the person from practicing as soon as possible.
 - c. find some way to discredit the practitioner.
 - d. find evidence that someone has been harmed.

Answers
1. c
2. d
3. b
4. d
5. b
6. a
7. c
8. d
9. b
10. b
11. d
12. a

Section 2.0

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