![Smart Life Forum]

Bill Grant, PhD

Summary of Ideas on the Health of Nations : National Diets and Diseases

Thursday, May 18, 2006
7:00 PM

Cubberly Community Center
4000 Middlefield Road, Room H1, Palo Alto, California

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Future Speakers:

• June 15, Dr. David Steenblock - *Umbilical Cord Stem Therapy, the Gift of Healing from Healthy Newborns.*

He will discuss different types of stem cells and their uses as well the benefits of umbilical cord cells. He will also cover treatments done in Mexico.

FMBR Meeting Notice: Friday, April 28, 2006: Dr. James Swan, Ph.D. will speak about consciousness as presented in TV and feature films, and how the message of this wisdom can be expanded for the benefit of the general public. Jim has worked with native cultures and the consciousness of Nature, while at the same time interacting with Western media. He is the author of seven books, consulted on over a dozen feature film scripts, has appeared in 20 feature films and three dramatic TV series, and is currently a Senior Columnist for ESPN. For details go to http://www.FMBR.org

Julia Ross Meeting notice, April 22-23, "Amino Acid Therapy: Eliminating Negative Emotions and False Appetites That Block Healing, Including Proven Alternatives to Antidepressants"; Saturday and Sunday April 22-23, 2006 Menlo Park , California . For training details and registration information, go to: http://www.moodcure.com/training.html

Meet Bill Grant

William Grant has a Ph.D. in physics from UC Berkeley. He spent 30 years in a professional career devoted to developing and using laser systems for the remote measurement of atmospheric constituents. During the last 15 years of his career he worked in Atmospheric Sciences at NASA Langley Research Center in Hampton , Virginia where he participated in many field programs to study the remote atmosphere. During his stay in Virginia , he began his study of diet and solar ultraviolet-B (UVB) links to chronic diseases. He retired in 2004 and moved to San Francisco where he established Sunlight, Nutrition, and Health Research Center (SUNARC, www.sunarc.org) to extend his health studies.

Main Presentation

His presentation will be based both on The China Study by T. Colin Campbell with Thomas

M. Campbell and his own work using the ecologic approach with a variety of chronic diseases. The goal of this presentation is to acquaint listeners with the approaches scientists use in identifying links between diet and the environment and chronic disease so that they can make better decisions in their own lives.

Epidemiologic Approaches

There are several primary epidemiologic approaches that are used to identify and quantify links between risk-modifying factors and diseases: case-control, cohort, and ecologic. Each has its advantages and disadvantages. In the case-control approach, a set of people who have a given disease outcome are matched with another set without the disease outcome and their diets and lifestyles are compared. In the cohort approach, a particular group of people, such as nurses, is followed for many years with a series of questionnaires on their health status, diet and lifestyle. In the ecologic approach, populations defined geographically are the units, and both disease outcomes and diet and lifestyle factors are averaged for the population. Note that all 3 approaches are observational in nature and that associations identified may not necessarily be causal. While the case-control and cohort approaches use real people, these approaches suffer from the fact that those included in the studies generally do not have large differences in the risk-modifying factors. Thus, when Harvard announces results from their Nurses' or Health Professionals' studies, such as dietary fat does not affect the risk of breast cancer, it pays to be a bit skeptical. The ecologic approach overcomes this limitation, but must be applied carefully to minimize the effect of other limitations such as comparing populations that have important differences that are not included in the model. As Phil Jacklin recently pointed out, the ecologic approach can be considered a "triple blind" study in which neither the doctors nor the patients know they are in a study.

Causality in a biological system

In order to make the claim of causality, the link should satisfy a number of criteria. Dr. A. B. Hill laid out the more important criteria in his address to the Royal Medical Society in 1965. These criteria include: high strength of association, generally a linear dose-response relation, replication in different populations, identified mechanisms, and ruling out confounding factors. He always applies these criteria to any new finding he makes regarding risk factors for chronic diseases. Nonetheless, his most important findings are not accepted until others confirm them using the case-control or cohort approaches.

Diets of nations

A related question is why do different countries have different diets? He has not explored that question in detail, but he is aware of some of the reasons. Agricultural cultivation of grain began in the Middle East about 10,000 years ago. The vegetation, soils, water, climate, etc., provided a suitable environment. That helped with the advancement of civilization since now the population could stay in one location, expand the population, and do things such as build pyramids. On the other hand, dairy products became important in northern Europe since no crops could be grown or harvested in winter, so those who were lactose tolerant had a better chance of survival. The Inuit came to rely on marine fish and mammals, even obtaining their vitamin D from these cold-water animals. In the tropics, fruits and vegetables grow easily, and people do not need energy dense foods in order to survive cold winters.

What is then interesting is that the diet developed for northern Europe has been largely adopted in most Western Developed Countries and is now spreading to developing countries as well. The reasons for adopting the Western diet seem to be related to manufacturing of food products that pander to tastes humans are programmed to like, such as fat, sugar, salt, corporate profit, and aggressive marketing practices, with a liberal dose of "myth" thrown in. There are two definitions of myth: one is a concept that does not withstand close scrutiny; the other is a concept that forms the basis for action. Portraying milk as a good source of calcium is an example of the myth in both of its meanings; it does not stand up to scientific scrutiny, but it encourages people to consume milk. This talk will examine some of the consequences of spreading the Western diet to developing countries.

The China Study

Colin Campbell and his son, Thomas, wrote a book, The China Study, about diet and chronic disease based in part on his study of diet and chronic disease in China and in part on various multi-country studies using the ecologic approach.

Colin Campbell began life on a dairy farm and loving milk and through his research in the Philippines and elsewhere became a vegan. His progress from an omnivore to a herbivore is detailed in The China Study. In his talks, he mentions how he went to the Philippines in the 1960s to help the people overcome the "protein gap." As they introduced more milk

into the national diet, they were disturbed to learn that children as young as 4 years old were developing liver cancer. Through animal studies, they eventually determined that casein, the primary protein in milk, destroyed an enzyme in the liver that detoxified aflatoxin, which is endemic in a hot, humid country. He points to data showing that milk is not a good source of calcium. For example, hip fracture rates are positively correlated with calcium consumption and inversely with vegetable-to-animal protein intake in a pair of ecologic studies. He has also used results from my study of milk and prostate cancer showing a strong correlation between milk consumption and prostate cancer risk in his talks on his book.

The differences between the diet of China and the U.S. around 1990 are quite striking. The values, for China and the U.S. were: energy (calories, abbreviated kCal), 2641 and 3463 kcal/person/day, total fat, 15 and 35% of energy; dietary fiber, 33 and 12 g/day; protein, 64 and 91 g/day; animal protein, 1 and 10% of energy. As a result, total cholesterol measured in Chinese in the early 1980s ranged from 90 to 170 mg/dL, while that in the U.S. raged from 170 to 290 mg/dL.

In the 1950s, a time before there were the high-tech medical interventions we have today, coronary heart disease (CHD) rates appeared to be largely related to diet: the U.S. had 700 deaths/100,000 (100k) people/year; Canada, 600; Chile, 300; Italy, 250; and Japan, 150 (p. 116). The rates roughly correlate with diet. He did a quick ecologic study using dietary data for 1961-3 and found that added sugars had the highest correlation with the values for the 20 countries. In the 1960s, there was a fierce debate between Ancel Keys and John Yudkin (a diabetes doctor) over which dietary component had the strongest correlation with CHD, with Ancel claiming that animal fat was the culprit and John Yudkin claiming that it was sugar. Ancel was able to marshal the data more convincingly and won the argument. In 1998, he held a press conference to announce that dietary sugar was the most important dietary risk factor for CHD for women below the age of 60 years. Not only did the sugar industry come down on me, but so did the American Heart Association. They had accepted dietary fat as the main risk factor, and were busy marketing the AHA seal of approval for low-fat foods, never mind whether sugar replaced the fat. It is well-known now that sugar gives rise to triglycerides and low density cholesterol, and is a risk factor for CHD, but evidently not then. Unfortunately, the U.S. Congress accepted the Ancel Keys hypothesis in the late 1970s and decreed that America should go on a low-fat diet. That was the beginning of our turn to processed carbohydrates and the rising tide/epidemic of obesity. This event is an example of the influence of epidemiologic studies, right or wrong.

In addition, another factor contributing to the obesity epidemic in the U.S. is crop subsidies. Professor Michael Pollan (UC Berkeley) has a new book, *The Omnivore's Dilemma: A Natural History of Four Meals* . He presented a portion of the book in a lecture on April 5 entitled "The Cornification of America." He pointed out that President Nixon with the aid of his Secretary of Agriculture came up with farm subsidies as a way to help protect farmers from wild price swings. They pay farmers the difference between fair market value and a price set to help the farmers. Thus, farmers have an incentive to grow more corn, etc. What has happened is that corn production has increased from 20 bushels/acre to 200 bushels/acre and corn acreage has increased to about 80 million acres, and raising cattle was taken from the fields, which were converted to corn production, and put in feed lots. With the excess corn production, food producers and the government sought various ways to dispose of the excess. It ends up as high fructose corn syrup, added to many products, portion sizes are increased, and corn is fed to livestock. Sixty percent of corn passes through livestock in the U.S. Feedlot operators can obtain corn cheaper than farmers can grow it. The dietary guidelines emphasize corn-related foods such as meat and, to some extent, milk. Another very interesting point Prof. Pollan made is that while the fraction of the gross national product spent on food and health combined has remained near 24% between the early 1960s and now, the fraction spent on food decreased from 18% to 9% while the amount spent on health care increased from 5% to 16%. Evidently when we paid more for naturally grown food, and didn't have all the fast food or as much food as we do today, we were healthier. That is further evidence that cheap food has an adverse impact on health.

One of the key papers in such studies is that by Bruce Armstrong and Richard Doll, published in 1975, who investigated dietary links to 18 types of cancer using data from the early 1970s. They found strong correlations between various animal products, fats, and sugar and many types of cancer, while cereals/grains and fruit were often inv ersely correlated. This paper has received nearly 1300 citations in the peer-reviewed literature. However, cohort studies, such as the Nurses' Health Study at Harvard, have had difficulty in confirming the findings in Armstrong and Doll. The reason given in The China Study and supported by my research is that American nurses generally eat similar diets so that statistical fluctuations mask the role of animal products in the risk of cancer.

Colin also comes down very hard on the government agencies and committees involved in developing dietary guidelines for the U.S. He served on a number of committees during the past 20 years, and is well aware of the ways corporations are able to load and control the committees. He points out in The China Study that current dietary guidelines would permit up to 25% added sugar, 35% fat, 35% protein, and 65% carbohydrates (these are upper

limits, and add up to more than 100%). Thus, one could eat a Big Mac and a milkshake and conform to the guidelines. The guidelines are designed with the health of corporations and agricultural interests, but not with the health of the people in mind. A number of studies have found that complying with the dietary guidelines is not associated with optimal health.

Colin Campbell is well known in scientific circles for his role in the study, *Diet, Life-style and Mortality in China* , J. Chen, T. C. Campbell, J. Li, and R. Peto, Oxford University Press, 1990. They went to 2 towns in each of 65 counties in China in the early 1980s and collected information on disease outcomes as well as diet, serum levels of many compounds, and many other measures of the people that might be linked to health or disease. This study contains a wealth of information that has been and continues to be used in ecologic studies. Dr. Grant is currently using the data to study links to cancers and cardiovascular diseases. Also he found that factors related to vitamin D production indicate that solar UVB has an important role in reducing the risk of several cancers including lung cancer as well as coronary heart disease in China .

Dr. Grant's research

His first foray into studying dietary links began in 1996 when he read that Japanese American men in Hawaii had 2.5 times the risk of Alzheimer's disease (AD) as native Japanese. He recalled the paper by Armstrong and Doll, and decided to determine the dietary links to AD by comparing dietary factors to incidence of AD in several countries. He found data for 11 countries, and quickly identified total energy (calories) and total fat as important risk factors, with fish being an important risk reduction factor for countries with high fat diets and diets high in cereals/grains. He published these findings in 1997. The results were not fully accepted until others using the case-control approach confirmed all of his findings. Dietary guidelines for reducing the risk of AD are now well-known.

Genetics also plays a role. African-Americans have 4 times the risk of AD of those living in Nigeria. Africans have a high prevalence (30%) of APOE epsilon4, the "thrifty gene," while Japanese have a low prevalence (10%). Thus, African-Americans are more likely to gain weight when they eat the American way, while Japanese are not.

Another way of investigating the role of diet in chronic disease is to look at change in diet and subsequent changes in chronic diseases. When this is done in specific countries, the assumption that the dietary factors are linked to the disease can be more carefully

controlled, especially if similar changes are seen in a number of countries. His first attempt at this was to investigate the role of diet in the expression of rheumatoid arthritis (RA). He found a paper in which the effects of RA, time lost from work and hospital discharges, were carefully tabulated for half a dozen European countries for the period 1965-75. There were rapid increases in RA effects around 1970. Looking at the dietary supply data for the countries involved, He found that in all cases meat consumption increased significantly around 1970. The economies of those countries had suffered during World War II, and it wasn't until about 1970 that they felt rich enough to start adding meat back to the national diets. The mechanism appears to be inflammation arising from the arachidonic acid found in meat fat. This work has received considerable support lately.

In his redoing of the classic Armstrong and Doll work on breast cancer, he found that the primary risk factor was the fraction of energy derived from animal products, with alcohol a secondary risk factor, and both fish and solar UVB reduced the risk. The mechanisms for all of these factors are generally known. Thus, the breast cancer hot spots in Marin County and Long Island are very likely due to affluent women having an unfortunate combination of known risk factors. Alcohol was even confirmed in Marin County a couple of years ago. Nonetheless, both regions have funded studies to seek those environmental pollutants that could be causing the higher risks.

As an example of the approach to be used in this work, the temporal variations of colorectal cancer mortality rate were obtained from the International Agency for Research on Cancer (IARC) for males aged 45+ years and compared to dietary animal products taking into account the lag time between years of eating animal products and the eventual development of colorectal cancer . A lag of 10–20 years yielded the highest correlation for various countries such as Bulgaria , Greece , Japan , Korea , and Spain . For most countries inhabited by Europeans or their descendants, the estimated total animal product energy for 50 deaths/100k/year was in the range of 630–810 kCal/day/person. However, for Japan , the estimated animal product energy associated with 50 deaths/100k/year was 300 kCal/day.

In a more recent study of prostate cancer, in which he researched the literature as well as performed an ecologic study, he was impressed at how animal products were generally associated with increased risk while vegetable products were associated with reduced risk. His ecologic study identified milk as the important risk factor, with vegetable protein, vitamin D, fish, and onions associated with reduced risk. Fish are an important source of vitamin D, omega-3 oils, selenium, and iodine, all of which seem to reduce the risk of prostate cancer. All of these factors have been found in other studies. The mechanisms

for vitamin D, fish, and onions are known, but the mechanisms for milk and vegetable protein are not.

It is also interesting to look at prostate cancer trends in several Asian countries that moved towards the Western diet in the past several decades. Japan is a good example. Prostate cancer rates rose from 12/100k/year in the 1960s to 27/100k/year in 2000. Prostate cancer rates seemed to follow trends in animal products with about a 10-year lag. It is not clear which component of animal products is responsible or if it is animal products in general.

Data in this table support the hypothesis that a low-animal product, low-fat diet can be associated with a long life expectancy, as long as the diet supplies the essential nutrients in sufficient quantity. Much of the animal product energy in Japan come from seafood. Japan seems to have the best overall health statistics. Thus, their dietary supply profile, with total energy near 2900 calories (which corresponds to about 2000 calories actually consumed), protein around 13% of total energy, and fat around 25% of total energy may be near optimal for good health. However, as they have added more meat to their diet, rates of cancers common in Western developed countries, such as colorectal and prostate, are rising rapidly. On the other hand, coronary heart disease (CHD) rates in Japan are still low. India, on the other hand, has too little energy, protein, and fat in their national diet. While cancer rates are low, diabetes mellitus and CHD rates are high, due to the high fraction of unopposed simple carbohydrates in the national diet.

Dietary supply data for 1992-4. About 70% of the values are actually consumed by individuals.

Country	Animal Product (kcal)	Veget Prod. (kcal)	Protein (kcal, %)	Fat (kcal, %)	Carbs (kcal)
Canada	917	2142	384, 13	1135, 37	1540
France	1358	2186	463, 13	1474, 42	1606
Germany	1117	2264	393, 12	1291, 38	1698
India	166	2231	232, 10	376, 16	1789
Japan	593	2297	380, 13	710, 25	1800
Korea	464	2765	342, 11	670, 21	2217
UK	1045	2171	362, 11	1252, 39	1602
USA	1107	2502	450, 12	1281, 35	1879

Life expectancy and health care expenditures.

Country	Life Exp At 60, M, F (yrs)	Life Exp (yrs)	Health Expend (% of GNP)
Canada	16.1, 19.3	80	9.6
France	16.5, 20.3	80	9.7
Germany	15.9, 19.0	79	10.9
India	10.8, 11.4	62	6.1
Japan	17.5, 21.7	82	7.9
Korea	13.2, 17.1	76	5.0
UK	15.7, 18.1	79	7.7
USA	15.3, 17.9	77	14.6

It should also be noted that health expenditures as a fraction of gross national product (GNP) are highest for the U.S. but that all measures of health are not commensurate with that level of expenditure. An interesting comparison is between Paraguay and Uruguay . Paraguay has a typical Latin American diet while Uruguay has a Western Developed

Country diet. Cancer rates associated with diet are higher in Uruguay than in Paraguay, but life expectancy is slightly lower in Paraguay. In terms of life expectancy lost to poor health: 14% in Paraguay, 12% in Uruguay. Thus, diet certainly affects the risk of various diseases; the extent to which it affects healthy life expectancy is a much more complex issue.

Total cancer incidence and CHD mortality age-adjusted rates (per 100,000 people/year)

Country	Breast Cancer	Colorectal Cancer Males	CHD Male	CHD Female
Canada	84.4	42.2	109	54
France	91.9	40.8	49	18
Germany	79.8	45.5	126	60
India	19.1	4.7	149*	120*
Japan	32.7	49.3	36	18
Korea	20.4	24.7		
UK	87.2	39.2	150	67
USA	101.1	44.6	121	67

* Not age-adjusted

Comparison of Paraguay and Uruguay

Country	Animal Products	Vegetable Products	Protein	Fat
Paraguay	562	1811	71 g	71 g
Uruguay	1012	1726	85 g	106 g

Country	Breast Cancer Incidence	CR Males	Life Expectancy at 60 yrs, M, F
Paraguay	34	10	11.7, 14.6
Uruguay	83	40	13, 17.1

Rates are cases/100k/year; CR, colorectal

Are we carnivores, omnivores, or herbivores?

In doing research on prostate cancer, he came across the web site, www.vegsource.com/veg_faq/comparative.htm , in which Milton R. Mills, M.D. compared the anatomy of eating (from feet and mouth to digestive organs) between carnivores and herbivores then looked at man's anatomy of eating. He will leave it as an exercise for the reader to look at this site before the meeting, but will present the findings in his talk.

Energy and resource considerations of dietary choices.

Raising livestock for food is inherently inefficient (about 10% conversion efficiency), and also entails utilization of large amounts of natural resources such as land, forests that are cleared in Brazil , and water. In addition, air and water quality are degraded from such things as cattle feedlots and hog farms. The world cannot accommodate the 9 billion inhabitants anticipated in 50 years all eating the way Americans do. It would take more than the Earth's biomass production capacity to provide that much meat, milk, fish, eggs, fresh fruit, etc. Thus, we should be thinking about replacing animal products with vegetable products at every meal.

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