

*Nicolaas Bloembergen* 80

Nico Bloembergen 80<sup>th</sup> Birthday Celebration  
Harvard University, 13 May 2000

**fru•gal** (fr̄gəl) *adj.*

1. Practicing or marked by economy, as in the expenditure of money or the use of material resources.
2. Costing little; inexpensive. —**fru•gal'i•ty** (fr̄-gal'ĭ-tē) or **fru'gal•ness** *n.* —**fru'gal•ly** *adv.*



# World Scientists' Warning to Humanity

18 Nov, 1992.

Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring about.

## The Environment

The environment is suffering critical stress:

### The Atmosphere

Stratospheric ozone depletion threatens us with enhanced ultra-violet radiation at the earth's surface, which can be damaging or lethal to many life forms. Air pollution near ground level, and acid precipitation, are already causing widespread injury to humans, forests and crops.

### Water Resources

Heedless exploitation of depletable ground water supplies endangers food production and other essential human systems. Heavy demands on the world's surface waters have resulted in serious shortages in some 80 countries, containing 40% of the world's population. Pollution of rivers, lakes and ground water further limits the supply.

### Oceans

Destructive pressure on the oceans is severe, particularly in the coastal regions which produce most of the world's food fish. The total marine catch is now at or above the estimated maximum sustainable yield. Some fisheries have already shown signs of collapse. Rivers carrying heavy burdens of eroded soil into the seas also carry industrial, municipal, agricultural, and livestock waste -- some of it toxic

### Soil

Loss of soil productivity, which is causing extensive Land abandonment, is a widespread byproduct of current practices in agriculture and animal husbandry. Since 1945, 11% of the earth's vegetated surface has been degraded -- an area larger than India and China combined -- and per capita food production in many parts of the world is decreasing.

# -Scientific Facts-



[ [SSWS](#) | [General Facts](#) | [Contentions & Responses](#) | [References](#) ]

1. [Not complying with applicable dose limits](#)
2. [Risk because no hot cell](#)
3. [Lacks procedure for verifying helium](#)
4. [External events could cause accidents](#)
5. [Radioactive contamination of ground water](#)
6. [Inadequate radiation monitoring](#)
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11. [NRC not authorized by Congress](#)
12. [Contention regarding the ALARA principle](#)
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16. [Emergency planning is deficient](#)
17. [Storage facility would become permanent](#)
18. [Dangerous facilities in the general area](#)

## Scientists for Secure Waste Storage

The opposition to this project has been intense and politically charged. Some of the foremost nuclear scientists have decided to intervene in the proceedings before the [Nuclear Regulatory Commission](#). They represent Scientists for Secure Waste Storage (SWSS), see *infra*. These scientists seek to provide objective scientific evidence in the [NRC](#) proceedings. Their intervention does not constitute an endorsement or opposition to this project. SSWS is represented by the [Atlantic Legal Foundation, Inc.](#), a non-profit law firm that brings scientific clarity to important national cases.



SSWS is composed of the following individuals:

### William A. Anders

- former Astronaut
- former Chairman NRC
- former Ambassador to Norway
- former Chair. General Dynamics Corp.

### Steven Barrowes, Ph.D

- University of Utah Researcher
- Post Doctorate in Physics

### Hans A. Bethe, Ph.D

- Professor Physics, Emeritus
- Cornell University
- Nobel Laureate in Physics

### Nicholaas Bloembergen, Ph.D

- Harvard University
- Nobel Laureate in Physics

### Robert Hoffman

- Radiation Safety Officer
- former member of Utah Radiation Board

### Daniel M. Kammen, Ph.D

- Asst. Professor Princeton University
- Patents pending for Solar Ovens

### Marcus A. Rowden

- former Trial Attorney for Dept. of Justice
- former Chairman NRC

### John W. Landis, Ph.D

- Chair. of Fusion Power Associates
- Dwight D. Eisenhower Award of Honor

### Norman F. Ramsey, Ph.D

- Higgins Professor of Physics

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No. 92-102

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Supreme Court Of The United States  
October Term, 1992

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WILLIAM DAUBERT and JOYCE DAUBERT,  
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JASON DAUBERT, and ANITA DE YOUNG,  
Individually and as Guardians ad litem  
for ERIC SCHULLER,  
Petitioners,

v.

MERRELL DOW PHARMACEUTICALS, INC.,  
*Respondent.*

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On Writ Of Certiorari  
To The United States Court of Appeals  
For The Ninth Circuit

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# Harvard's Bloembergen reflects on 'Star Wars'

*By Charles Ratliff  
Arizona Daily Wildcat  
February 29, 1996*

For "Star Wars" to work, a decade of laser weapon research would have been needed, said the co-chair of a 1986 committee studying the program.

Harvard University Professor Nicolaas Bloembergen, a 1981 Nobel co-laureate in physics, said the committee's conclusions concerning Ronald Reagan's Strategic Defense Initiative were "right on the mark."

Bloembergen related his experiences studying the Star Wars project to a group of 20 UA faculty and students yesterday as part of a graduate seminar studying the effect of government policy on science and technology.

The committee was mandated to study the effectiveness of Star Wars and dispel any doubt as to whether it would work. When Bloembergen's committee released its findings, it confirmed the scientific community's "gut feelings" that Star Wars would not work.

"We were asked to look about 10 years into the future and that is what we did," Bloembergen said.

Reagan announced in March 1983 that he would launch a massive research and development effort to build a high-technology defense system to guard against a Soviet missile attack.



# Leaky Gut Syndromes

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## LEAKY GUT SYNDROMES: BREAKING THE VICIOUS CYCLE

BY LEO GALLAND, M.D.

From the perspective of function, the contents of the gut lumen lie **outside** the body and contain a toxic/antigenic load from which the body needs to be protected. Protection is supplied by complex mechanisms which support one another: intestinal secretions (primarily mucus and secretory IgA), the mucosal epithelium, and intramural lymphocytes [1]. This primary, intestinal barrier is supported by the liver, through which all enterically-derived substances must pass before entering the arterial circulation for transport to other tissues and organs. Kupffer cells in the hepatic sinusoids remove absorbed macromolecules by phagocytosis. Hepatic microsomal enzymes alter gut-derived chemical substrates by oxidation and by conjugation to glycine and glutathione(GSH) for excretion into bile and for circulation to the kidneys. The cost of detoxification is high; reactive intermediates and free radicals are generated and anti-oxidants like GSH are consumed [2, 3]. Any compromise of intestinal barrier function increases the production of oxygen radicals and carcinogens by the liver's cytochrome P-450 mixed-function oxidase system. The excretion of oxidation by-products into bile and the reflux of this "toxic" bile into the pancreatic ducts may be the major cause of chronic pancreatic disease.[4, 5]

Compromised intestinal barrier function can also cause disease directly, by immunological mechanisms.[6-9] Increased permeability stimulates classic hypersensitivity responses to foods and to components of the normal gut flora; bacterial endotoxins, cell wall polymers and dietary gluten may cause "non-specific" activation of inflammatory pathways mediated by complement and cytokines. [10] In experimental animals, chronic low-grade endotoxemia causes the appearance of auto-immune disorders.[11-13]

Leaky Gut Syndromes are clinical disorders associated with increased intestinal permeability. They include inflammatory and infectious bowel diseases [14-19], chronic inflammatory arthritides [9, 20-24], cryptogenic skin conditions like acne, psoriasis and dermatitis herpetiformis [25-28], many diseases triggered by food allergy or specific food intolerance, including eczema, urticaria, and irritable bowel syndrome [29-37], AIDS [38-40], chronic fatigue syndromes [Rigden, Cheney, Lapp, Galland, unpublished results], chronic hepatitis [41], chronic pancreatitis [4, 5], cystic fibrosis [42] and pancreatic carcinoma. Hyperpermeability may play a primary etiologic role in the evolution of each disease, or may be a secondary consequence of it which causes immune activation, hepatic dysfunction, and pancreatic insufficiency, creating a vicious cycle. Unless specifically investigated, the role of altered intestinal permeability in patients with Leaky Gut Syndromes often goes unrecognized. The availability of safe, non-invasive, and



# Journal of the American Society of Nephrology

February 1999

Vol. 10, No. 2

Feature Article

## Mortality in End-Stage Renal Disease: A Reassessment of Differences between Patients Treated with Hemodialysis and Peritoneal Dialysis

EDWARD F. VONESH\* and JOHN MORAN\*†

\*Baxter Healthcare Corporation, Applied Statistics Center, Round Lake, Illinois; and †Vasca, Inc., Topsfield, Massachusetts.

**Abstract.** Recent registry studies comparing mortality between peritoneal dialysis (PD) and hemodialysis (HD) patients show conflicting results. The purpose of this study is to determine whether previously published results showing higher mortality for patients treated with PD *versus* HD in the United States continue to hold true over the period 1987-1993. National mortality rates for PD and HD were extracted from the U.S. Renal Data System (USRDS) annual reports for the cohort periods: 1987-1989, 1988-1990, 1989-1991, 1990-1992, and 1991-1993. Using Poisson regression, death rates per 100 patient years were compared between PD and HD for each cohort period controlling for age, gender, race, and cause of end-stage renal disease (diabetes *versus* nondiabetes). When incident patients and patients with a prior transplant were included in the analysis, starting with the 1989-1991 cohort, we found little or no difference in the relative risk (RR PD:HD) of death between PD and HD (1987-1989: RR = 1.17,  $P < 0.001$ ; 1988-1990: RR = 1.12,  $P < 0.001$ ; 1989-1991: RR = 1.06,  $P = \text{NS}$ ; 1990-1992: RR = 1.06,  $P = \text{NS}$ ; 1991-1993: RR = 1.08,  $P = 0.043$ ). After a test for goodness-of-fit, separate analyses for diabetic patients and nondiabetic patients were done to examine unexplained variation in death rates. For nondiabetic patients, there was less than a 1% difference in the adjusted 1-yr survival between PD and HD from 1989-1993 (1989-1991: RR = 1.05,  $P = \text{NS}$ ; 1990-1992: RR = 1.04,  $P = \text{NS}$ ; 1991-1993: RR = 1.07,  $P < 0.01$ ). Among diabetic patients, the PD:HD death rate ratio varied significantly according to gender and age. For the average male diabetic patient, there was little or no difference in risk between PD and HD from 1989-1993 (1989-1991: RR = 1.02,  $P = \text{NS}$ ; 1990-1992: RR = 1.05,  $P = \text{NS}$ ; 1991-1993: RR = 1.08,  $P < 0.01$ ). For diabetic patients under the age of 50, those treated with PD had a significantly lower risk of death than those treated with HD (1989-1993:  $0.84 \leq \text{RR} \leq 0.89$ ,  $P < 0.005$ ). Over the same period, female diabetic patients treated with PD had a higher risk, on average, than HD ( $1.18 \leq \text{RR} \leq 1.19$ ,  $P < 0.001$ ) as















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## Het A.P. Beerta-Instituut in 1982



**Frits Bloembergen**



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# NICOLAAS BLOEMBERGEN

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**Professor Emeritus, Harvard University, Cambridge, Massachusetts**

**Visiting Professor, Arizona Center for Mathematical Sciences, University of Arizona**

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# A Lifetime of Learning at Academy Village

## REDEFINING RETIREMENT

by John Stickler, Mature Market Editorial Services

"I like Tucson. It's much easier to find tennis partners." The voice on the line from Massachusetts belongs to Harvard professor Nicolaas Bloembergen, Ph.D. He is a Nobel laureate in the field of optical science and one of the first to sign up for a home in The Academy Village, an innovative retirement community in Arizona.

"There are three reasons we are moving to Tucson," Dr. Bloembergen says. "First, my wife wants to get away from the New England weather." The warm, dry winters in Southern Arizona are an obvious selling point.

"Second, the continuing care aspects of the community are very attractive. Being able to own a freestanding home is a plus. Here, if you want continuing care, you must live in a big building. And third, the optical sciences there..." Dr. Bloembergen is a pioneer in the development of lasers and plans to remain active in his field.



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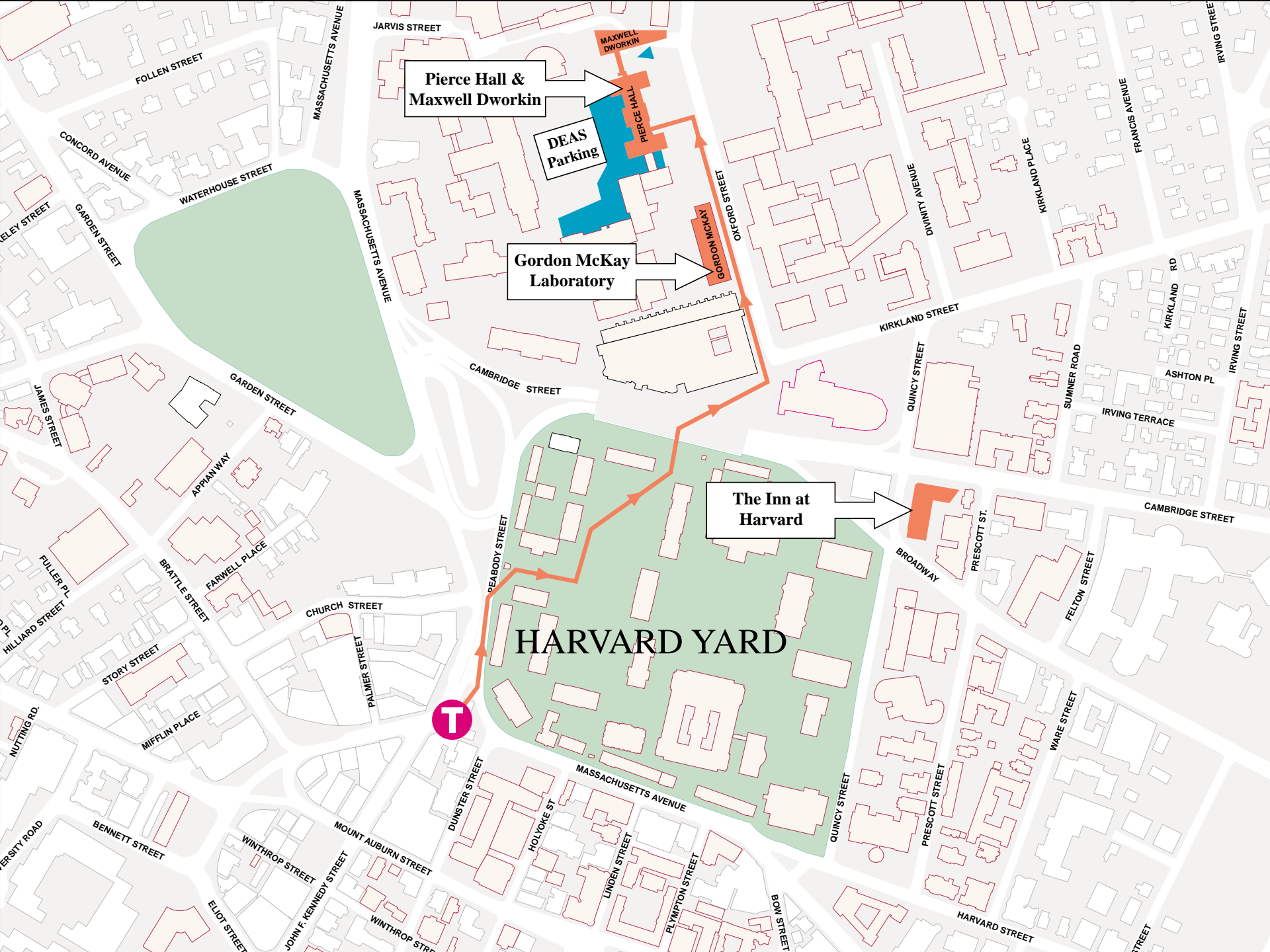
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*Nicolaas Bloembergen* 80

Nico Bloembergen 80<sup>th</sup> Birthday Celebration  
Harvard University, 13 May 2000



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