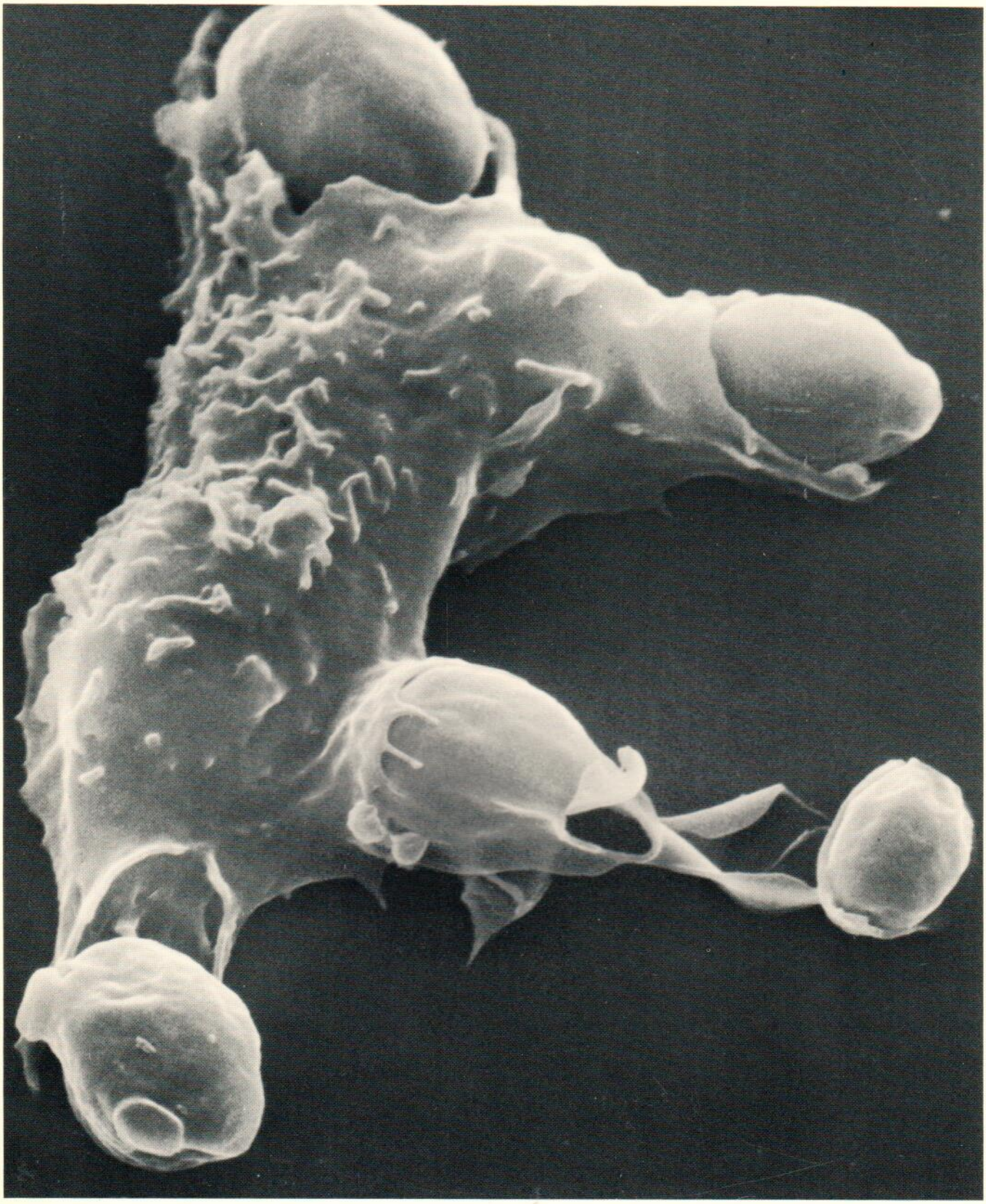

BOSTON BIOMEDICAL RESEARCH INSTITUTE is an independent, non-profit organization with a staff of M.D. and Ph.D. investigators who carry out a broad program of basic research in biology and medicine, and provide highly specialized training for future physicians and scientists. For two decades the Institute has maintained its position among the leaders in the world-wide effort to prevent and cure disease. Areas currently under investigation range from the study of birth defects to the biology of aging. The findings of Institute scientists are used by others in clinical projects including those aimed at helping people suffering from cancer and diseases of the heart, muscles, liver, and eye. The Institute's research programs will ultimately bring lasting benefits to the future well-being of mankind.

Cover photo:
White blood cell engulfing or phagocytizing several yeast particles.

Micrograph courtesy of M. J. Karnovsky, Department of Pathology, Harvard Medical School.

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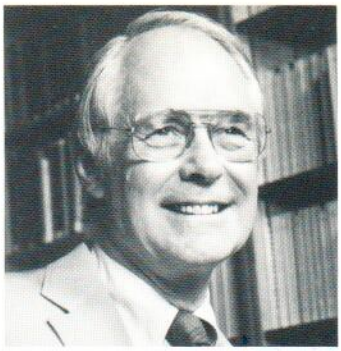


Boston Biomedical Research Institute, like only a handful of similar independent basic research organizations across the country, is dedicated to the pioneering research that is so vital to man's ongoing battle against disease. It is exciting work, especially when we can actually see potential benefits that could come out of the Institute's research.

At BBRI, our scientists represent our greatest resource. We are proud of the caliber of our investigators and of their professional reputations both within the US and internationally. Last year, for example, staff scientists invited abroad to deliver papers and share their expertise included Dr. Phang Tai, who traveled to Berlin, East Germany, and Helsinki, Finland; and Dr. Saroj Joshi, who presented a paper in Bari, Italy. In addition, Dr. Hartmut Wohlrab was invited to Rome; Dr. Zenon Grabarek to Brussels, Belgium; and Dr. John Gergely to Padua, Italy; Weimar, East Germany; Alpbach, Austria; and Moscow, U.S.S.R.

In this Annual Report we are pleased to feature the work of three young investigators who have recently joined BBRI's faculty. One, Dr. John Badwey, is involved in a research project aimed at helping the body fight off disease more effectively. Dr. Vic Raso is working on a program that appears to have direct application to the search for an AIDS cure. Dr. Barbara Jackson is studying how cells react to an excess of salt in their environment; this understanding could result in the development of new strains of crops that will thrive in parts of the world where, currently, the land is incapable of sustaining the cultivation of food crops due to large quantities of salt in the soil.

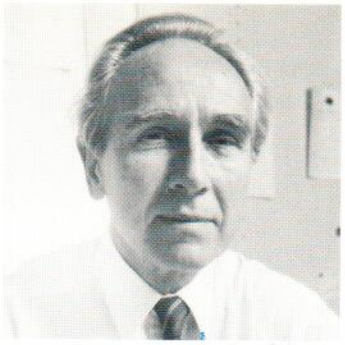
These investigators represent a standard of excellence that we hope to maintain as we launch a major recruitment drive aimed at the appointment of a senior scientist who could establish a new research department at BBRI and play a leadership role at the Institute as it enters its third decade. As some of the current department directors approach retirement age, the Trustees have approved this search as a necessary and timely step toward ensuring the continued preeminence of BBRI into the 21st century. We are fortunate that Dr. Elkan Blout accepted our invitation to chair a Search Committee which consists of ten outstanding Boston professionals drawn from BBRI, universities, industry, and law firms. We greatly appreciate the service that these friends are contributing to BBRI's future.

As we do every year, we gratefully acknowledge the individuals, foundations, and corporations that have assisted us this past year in our work. In particular we would like to mention a few gifts that have come to us from new and unexpected directions. These are especially welcome—and needed—in the face of a continued attrition of our traditional and major source of support, the NIH.

One major corporation (which wishes to remain anonymous) made a donation of $100,000 that will be used to assist in developing new research programs and in maintaining ongoing ones. General Cinema Corporation gave us a research grant of $42,700 for the continuation by Dr. Albert Wang of a pioneering smooth-muscle research project that was initiated by the late Jack Seidel. Finally, Digital Equipment Corporation donated $111,400, representing 65% of the cost of an excellent new DEC computer system. We also gratefully made use of funds donated by the Amelia Peabody Foundation to help with the Institute's contribution to this purchase of a system which not only greatly enhances our computing power but provides a means for communicating with scientists throughout the world.

We are most appreciative of all our supporters and look forward to another year of advances in biomedical research, which will be aided in a significant way by their generosity.

John B. French



In this Annual Report we attempt to explain the research activities of some new members of the scientific staff. It is important to realize that for our lay readers we must "explain" what our scientists do in their professional lives, because their ideas and objectives are necessarily highly technical. We must face the fact that the world is no longer built from earth, air, fire and water, and the language to describe its components has become specialized. That doesn't mean, of course, that our scientists are cold, impersonal technocrats whose humanity has evaporated in the sterile laboratory air. What kind of people are they? And what motivates our staff members to enter a field where inventiveness, technical ability and dedication are taken for granted, and where opportunities, not salaries, are often the lure to a new job?

I believe that the strongest motivations are curiosity and competitiveness. Tell scientists about two apparently incompatible findings, an up-to-now unexplainable observation, or a newly discovered organism with weird characteristics, and their curiosity—whatever their field of specialization—will be piqued; and they will want to be the first to explain it. The recent furor over "cold fusion" is a good illustration of how science works "at the frontiers."

Being a professional scientist is like being a crossword fanatic who is paid to do crossword puzzles. We are paid to wring the mysteries out of the world around us, and we enjoy it. Few of us would have preferred another profession.

To this esoteric world of scientific entrepreneurs, then, we welcome our three new staff members. We—especially the older older members of the staff—welcome their iconoclastic ideas and their uninhibited vigor. These younger scientists take for granted the sophisticated equipment, techniques and knowledge so hard-won by our generation, and use them as stepping stones to new knowledge, new vistas. This is the way it should be. We, the scientists, are confident that the ongoing and cumulative results of our work will benefit mankind. We hope that the society we live in will feel an appreciation—and benefits—of our accomplishments even if it cannot understand them. We, in turn, greatly appreciate those who see the promise in our endeavors. We hope that with the continued help of our Corporation and friends we may maintain our research effort, and that our community of dedicated scientists will continue to bring forth the fruit of their imagination, training, and diligence.

Peter F. Davison, Ph.D.

THE BODY'S SECURITY SYSTEM—HOW TO TRIP IT AND HOW TO EXPLOIT IT IN MAN'S BATTLE AGAINST DISEASES

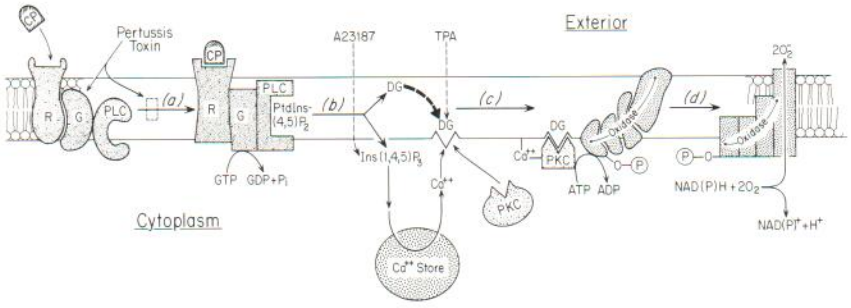
"IF WE CAN STOP THE LINK-UP OF PHOSPHATES WE CAN STOP THE PRODUCTION OF THE TOXIC CHEMICALS AND ALLEVIATE SOME OF THE PAIN INVOLVED IN AUTO-IMMUNE AND CHRONIC DISEASES."

Every healthy body has several built-in security systems. One of these is manned by certain types of white blood cells whose job it is to roam through the body—the way security guards patrol a building—looking for invading micro-organisms. When the "security guard" cell finds a foreign organism (a disease-causing bacterium, a yeast, or maybe a tumor cell) it must destroy it, or else the body will be damaged by the invader.

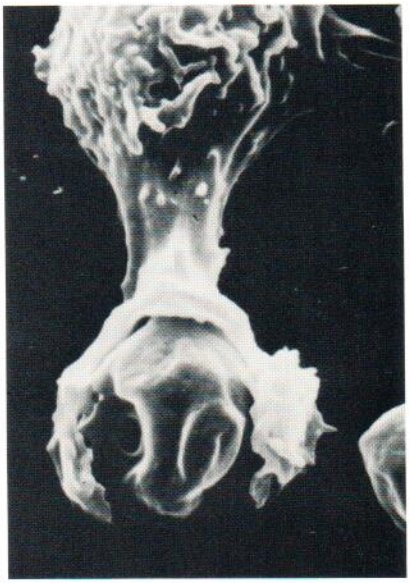
The white blood cell engulfs the invader and poisons it with several toxic chemicals. These chemicals include hydrogen peroxide (the same chemical used in hair bleach) and hypochlorous acid (which we find in Chlorox). This is a real Kamikaze mission, because at the same time as the white cell poisons the intruder, it also poisons itself and dies in its fight to protect the body.

CHRONIC AND AUTO-IMMUNE DISEASES CREATE SPECIAL PROBLEMS

Unfortunately, though, the battle is not always so swift or the body's victory so decisive. Some diseases are chronic, with infectious organisms hiding out, then reappearing again and again. Other diseases, rheumatoid arthritis, for example, are caused by auto-immunity; this means that (for reasons not yet clear) the body begins to attack itself. In either case the "security guard" cells produce more and more toxic chemicals in a futile attempt to kill off what they believe is the enemy. The result is the destruction of healthy tissue—joints and cartilage. And it is the destruction of this healthy tissue that causes the pain so characteristic of rheumatoid arthritis and other inflammatory conditions.



The Rube Goldberg machine by which a bacterium triggers a white cell to produce hydrogen peroxide.



A white blood cell engulfing a yeast cell.

HELPING THE BODY BATTLE DISEASE

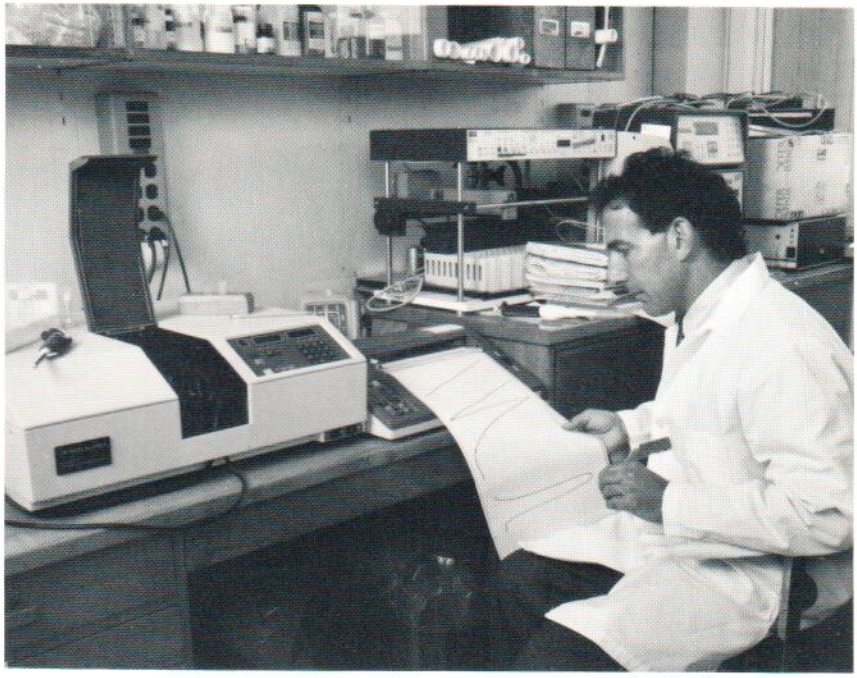
"But," Dr. John Badwey of the Department of Cell Physiology wants to know, "how do the cells produce these toxic chemicals? How do they know when to start and stop? And if we could regulate this production process from the outside, could we help the body identify and fight off disease-causing microorganisms more efficiently?"

A newly appointed staff scientist coming from Harvard Medical School, Dr. Badwey is working to answer these questions in his research program. "We have identified within the 'security guard' cell several proteins that are involved in the production of the toxic chemicals," he says. "Most interestingly, we have observed two proteins that link up to large numbers of phosphate molecules during the time the cells are producing these chemicals. We don't know why that is, but we've discovered that if we prevent the phosphates from linking up, or bonding, we block the poisonous chemicals from being produced."

And why does he want to do that? "Well," he explains, "the security guard white blood cells—the ones I'm working with are called phagocytes—don't realize when they begin to poison the body's own healthy tissue. But we do. And if we could stop the link-up of phosphates we could stop the production of the toxic chemicals and alleviate some of the pain involved in auto-immune and chronic diseases."

"By the same token," he continues, "aiding the phosphate collection process may increase the toxic chemical production and help the body wipe out certain types of infectious organisms—staph, for instance—more quickly and effectivly than it would do on its own."

"It's tremendously exciting work," Dr. Badwey says. "We're a long way from actually helping patients, but it is rewarding to see some practical benefits that could come out of our research."

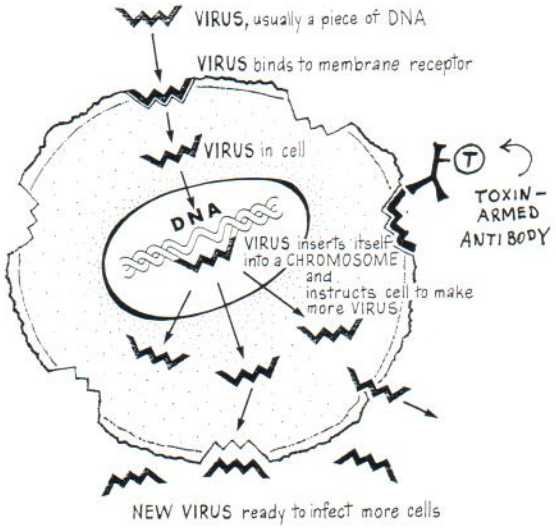


When certain types of white blood cells detect invading microorganisms, they produce toxic chemicals to try to kill the invaders. Dr. John Badwey measures the release of these chemicals.

"THERE'S A LOT WE STILL DON'T UNDERSTAND ABOUT THE VICIOUS CIRCLE OF MULTIPLICATION OF THE AIDS VIRUS IN THE VERY CELLS THE BODY PRODUCES TO FIGHT THE DISEASE. HOWEVER, WE ARE VERY HOPEFUL ONE DAY OF BEING ABLE TO CONTRIBUTE TO AN ACTUAL CURE FOR AIDS."

When a physician examines an AIDS patient with far-advanced disease, he sees a person whose immune system has been hopelessly outgunned. The physician can treat the concomitant illnesses—Kaposi's sarcoma, pneumonia—the whole range of strange and terrible opportunistic infections that strike when the body cannot fight back strongly enough.

What the physician cannot do, though, is to eradicate the actual AIDS virus, which multiplies so prodigiously in the very cells that the body produces to fight it. Learning how to eradicate the virus by breaking this vicious circle is the job of the biomedical researcher.



An AIDS virus entering a T-cell, multiplying within the cell, and then bursting out to infect other T-cells of the immune system. At right, a toxin-armed antibody is attaching to the virus and will kill the infected cell, thereby stopping virus production.

After The Body at War, John L. Dwyer, M.D., Ph.D. New American Library. N.Y., 1988.

DR. RASO'S WORK HAS RELEVANCE TO AIDS

Dr. Vic Raso had been working in the areas of cell biology and immunology for some years before he joined BBRI's Department of Fine Structure. Here he became involved in a line of research that has begun to look as if it might have direct relevance to the desperate search for an AIDS cure.

After the AIDS virus gains access to a person's blood, Dr. Raso explains, it homes in on a structure called a "receptor" that is located on the outside membrane of a special type of cell in the blood. This cell is called a T-lymphocyte or T-cell. The virus somehow subverts the receptor into letting it enter the cell. Once inside, the virus quickly sets up shop. It inserts its genes into the T-cell's nucleus and eventually, using the cell's protein generating machinery, the virus makes multiple copies of itself. Next, in a characteristic "budding" state, the new AIDS viruses burst out of the T-cell. They remain attached for a while, poised on the cell's outer wall. Then they launch themselves, ready to find healthy new T-cells to invade where they can start the reproduction process all over again.

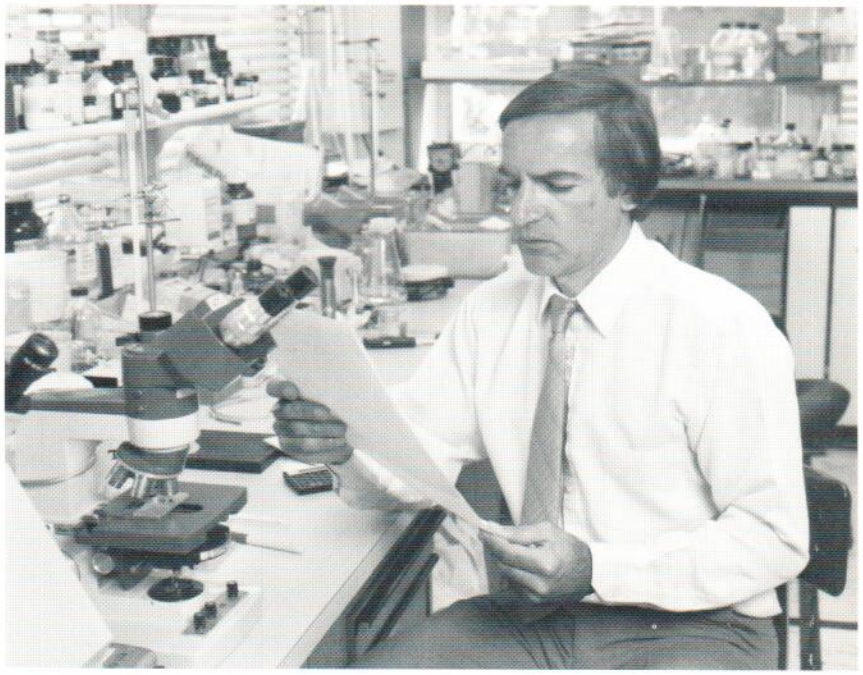
WORKING TO DESTROY INFECTED T-CELLS

What Dr. Raso plans to do, however, is to interfere with this reproductive cycle in a rather ingenious way. He would like to destroy the infected T-cell with all its new AIDS viruses before the viruses have a chance to do further harm. Technically, he explains, it's not the viruses themselves he's targeting in his research but specific proteins found in the shell, or envelope, of the viruses. And the weapons he is starting with are the natural antibodies produced by an animal that has been infected with AIDS.

NATURAL ANTIBODIES ARE NOT ENOUGH

"When an animal is infected," Dr. Raso explains, "it produces antibodies against the disease. Unfortunately, the antibodies are too few, too weak, or too late to do any good. Now," he continues, "what we have done is to purify those antibodies and make them really lethal by providing each of them with a deadly toxin. Essentially we have established an army of heavily armed and dangerous antibodies, each one instructed to seek out and bind with these specific proteins in the envelope of the AIDS viruses."

When a virus with these antibodies and their loads of poison slips inside the T-cell, the poison shuts down the cell's protein-making machinery, bringing about the death of the whole infected cell. At present we are able to eliminate AIDS-infected cells growing in the test tube. Future experiments are aimed at developing this technology toward use in animals actually infected with the AIDS virus.



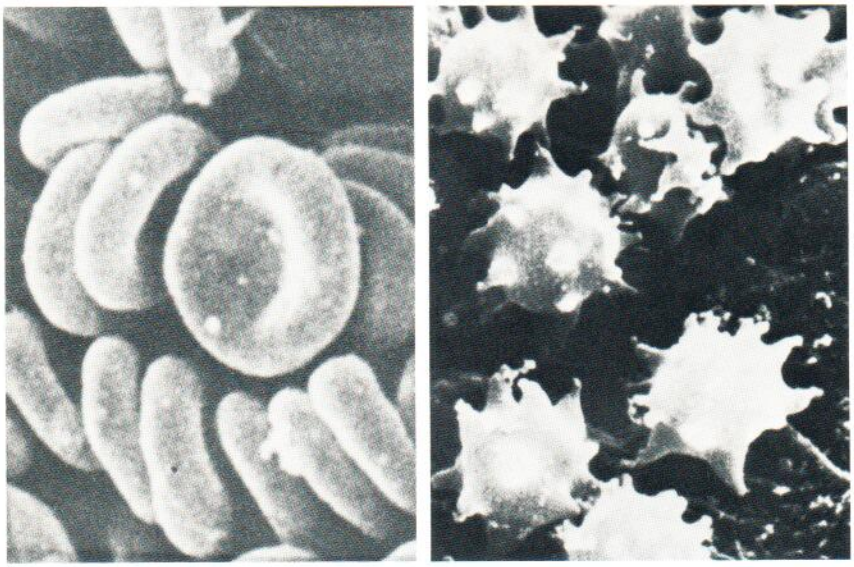
Dr. Vic Raso analyzes data confirming that natural antibodies armed with lethal toxins can kill T-cells infected with the AIDS virus.

"NATURE IS FILLED WITH SCHEMES FOR ADAPTATION AND GROWTH. WHAT WE LEARN NOW ABOUT YEAST MAY ONE DAY AID US IN THE PREVENTION OF WORLD HUNGER."

Fully one-third of the world's arable land is too salty for efficient cultivation. What this translates into is poor crop yield and, consequently, irreparable nutritional deficiencies or starvation for large numbers of people throughout the world. It stands to reason, then, that if crop strains could be developed that are more tolerant of salt, thousands of square miles of currently marginal land could be made more fertile and human suffering significantly reduced.

That is the big picture. Of more immediate and practical concern to researcher Dr. Barb Jackson of the Department of Metabolic Regulation is her work on how organisms simpler than crop plants react to an excess of salt in their environment, in the hope of understanding the molecular mechanisms governing tolerance to salt.

"When a yeast cell, for instance, finds itself in a salty solution," she explains, "its natural tendency is to balance its internal environment with the more concentrated external environment. But in doing this, the cell often dehydrates itself, which is damaging. She adds, "Many cells, including some of our own, have learned to resist the tendency to dehydrate by adding either salt or some other substance to their own fluids, thereby bringing their internal concentration into balance with the external environment without becoming dehydrated." This adaptive mechanism is called osmotic adaptation, and it is what Dr. Jackson studies in her laboratory.



The microphotograph on the left shows normal human red blood cells as they appear in our blood. On the right are the same cells dehydrated and shrunk after exposure to a concentrated salt solution.

HOW YEAST REACTS TO AN EXCESS OF SALT OR OTHER SUBSTANCES

Her research uses yeast—ordinary Brewer's yeast. She and her research assistant Chen Tung have discovered that when they place yeast in a salty solution, the cells get a message that tells them to set about the business of adapting their internal environment to the external environment. Cleverly, however, the yeast cells' adaptation results in the production not of salt—which would damage them—but of glycerin. This glycerin both supports the cells' metabolism and lessens cell damage from the salty environment.

TOO LITTLE SALT IS AS BAD AS TOO MUCH

Osmotic regulation, Dr. Jackson points out, does not apply only to organisms that are trying to cope with too much salt. Cells can also adapt to high concentrations of other substances—for example, sugar. Moreover, too little salt can pose just as big a problem for a cell as too much. Organisms that successfully adapt to solutions that are extremely dilute include Legionella, the pathogen responsible for Legionnaire's disease. This can live and multiply for months in hospital water tanks or hotel air-conditioning units, causing dangerous epidemics.

"What we don't know about the process of osmotic adaptation far exceeds what we know," cautions Dr. Jackson. "We don't know how cells sense a need to adapt to a changed environment. We don't know how they accomplish the actual adaptation."

POSSIBLE APPLICATIONS FOR WORLD-WIDE HEALTH PROBLEMS

But when these mysteries are solved, she feels that it is conceivable that scientists could help organisms—including crop plants—to grow well in brackish environments.

Dr. Barb Jackson (shown with associate Pierre LeBlanc) examines yeast growing in a nutrient broth that is used to test the tolerance of yeast to salt.

Without the generous donations from so many individuals, foundations, and corporations, many of our triumphs over the past 20 years would have been impossible, and many of our hopes for the next 20 years would be unattainable.

This year the generosity of BBRI's many friends brought our Annual Research Fund to $185,000, which helped meet the Institute's most pressing needs. We know that these needs will be significantly higher in the foreseeable future and trust that our supporters will meet that challenge.

In addition to the unrestricted contributions to the Annual Research Fund, we received three "New Frontiers" gifts. A corporation which chooses anonymity gave BBRI $100,000 to help develop new research programs; Digital Equipment Corporation donated $111,400 towards a customized computer system; and General Cinema Corporation contributed a grant of $42,700 for research on smooth muscle.

Your partnership with BBRI makes a difference in scientific and medical progress. Thank you!

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Dr. Walter Stafford installing a memory expansion board in the Digital computer facility which preceded BBRI's impressive new DEC system. The new system was made possible by a generous equipment grant from Digital Equipment Corporation.

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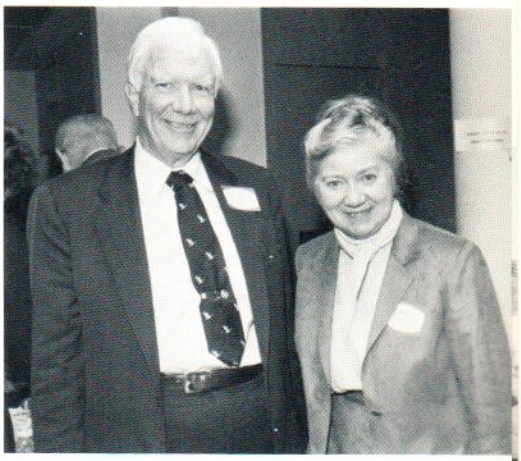
Mary Alice Nichols catching up on the news with, left to right, Drs. Peter Davison, Executive Director; John Gergely, Deputy Executive Director; and Rao Sanadi, Director of Cell Physiology



Emily Hubbs Scott, member of the Corporation, with her husband, Dr. Alfred Scott

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Daniel A. Phillips
William B. Tyler

Long-Range Planning Committee
Donald G. Comb
Chairman

John B. French
John A. Shane
William B. Tyler

Nominating Committee
Eustis Walcott
Chairman

Katherine L. Babson, Jr.
Ronald Garmey
Lynn Jachney
Joseph T. McCullen, Jr.
John A. Shane

Patents and Inventions Committee
Elkan R. Blout
John M. Buchanan
David A. Gibbs

Special Events
Anne B. Stone

Technology Transfer Committee
John F. Taplin
Chairman

Elkan R. Blout
John M. Buchanan
John B. French
David A. Gibbs

Marion (Mrs. David) Crockett with Albert Fortier, member of the Corporation

And this is the BBRI staff, for whom biomedical research is an ocean that can never be crossed, a world that will never be completely explored.

Department Directors
Peter F. Davison, Ph.D.
Fine Structure Research

John Gergely, M.D.,Ph.D.,D.Sc.M.(hon.
Muscle Research

Henry Paulus, Ph.D.
Metabolic Regulation

D. Rao Sanadi, Ph.D.
Cell Physiology

Senior Scientists
Noriaki Ikemoto, Ph.D.
Amelia Peabody Senior Scientist

John Codington, Ph.D.
Eiji Fujimori, D.Sc.
Jen-Shiang Hong, Ph.D.
Sherwin S. Lehrer, Ph.D.
Paul C. Leavis, Ph.D.
Renne C. Lu, Ph.D.
Victor A. Raso, Ph.D.
Nilima Sarkar, Ph.D.
Frank A. Sreter, M.D.,D.V.M.,Ph.D.
Phang C. Tai, Ph.D.
Terence Tao, Ph.D.
Hartmut Wohlrab, Ph.D.

Principal Scientists
Philip J. Graceffa, Ph.D.
Saroj Joshi, Ph.D.
Terrence L. Scott, Ph.D.
Vladimir Z. Volloch, Ph.D.
Chih-Lueh Albert Wang, Ph.D.

Staff Scientists
John Badwey, Ph.D.
Walter F. Stafford, III, Ph.D.

Visiting Staff Scientist
Barbara Jackson, Ph.D.

Research Associates
Alexey G. Basnakyan, M.D.
Zenon Grabarek, Ph.D.
Yoshiharu Ishii, Ph.D.
Katsuhide Mabuchi, Ph.D.
Suh-Der Tsen, Ph.D.
Li-Wen C. Wang, Ph.D.

Staff Fellows
Nikolai Boubnov, M.D.,Ph.D.
Cuneyt Bukusoglu, Ph.D.
Ling-Ling Chen, Ph.D.
James Fandl, Ph.D.
Robert Ganson, Ph.D.
Agnes Jancso, Ph.D.
Jaw-Jou Kang, Ph.D.
Ali Javed, Ph.D.
Tomoko Ohkusa, M.D.
Anne Phelps, Ph.D.
Michel Ronjat, Ph.D.
Christian Schobert, Ph.D.
Bruce Schweitzer, Ph.D.
Ruo-Ying Tan, Ph.D.
Jing-Lun Wu, Ph.D.
Haoda Xu
Xun Zhang

Research Fellows
Svein Haavik, Ph.D.
Kathleen Ogata, Ph.D.
Wenlong Ying, Ph.D.

Research Assistants
Ghazala Ali, M.S.
Adelaida D. Carlos, B.S.
Fenbiao Gao, M.S.
Dianne Goldrick, B.A.
Zeng Gong, B.S.
Elizabeth Gowell, B.S.
Valerie L. Heemstra, M.S.
Mary Kenneally, B.S.
Michaela Lerner, M.S.
Jian-Ping Lian, M.A.
Yang Lu, M.S.
John McGrath, B.S.
Simin Niu
Sophia Rits-Volloch, M.S.
Adel Taresfalvi
Jing Wang, M.S.
Zhiyan Wang, B.S.
Zilong Wen
Anna G. Wong, B.A.
Yu-Jing Yang, M.S.
Nian-Jun Yu

Distinguished Visiting Scientist
San-Chiun Shen, Ph.D.
Professor of Molecular Genetics
Shanghai Institute of Plant Physiology
Academia Sinica

Visiting Scientists
Gong-Jie Cao
Nai-Yong Chen
Su-Hua Hsu
Fu-Mei Hu
Shu-Qin Jiang
Zhi-Gang Li
Yude Qian
Toshiaki Sagesaka, M.D.,Ph.D.
Satyapriya Sarkar, Ph.D.
Kai Tao
Jing-Juan Zhang

Administration
Vincent F. Raso, C.P.A.
Assistant Executive Director/Controller

Patricia Brouillette
Administrative Assistant

Helene Clinton
Administrative Assistant

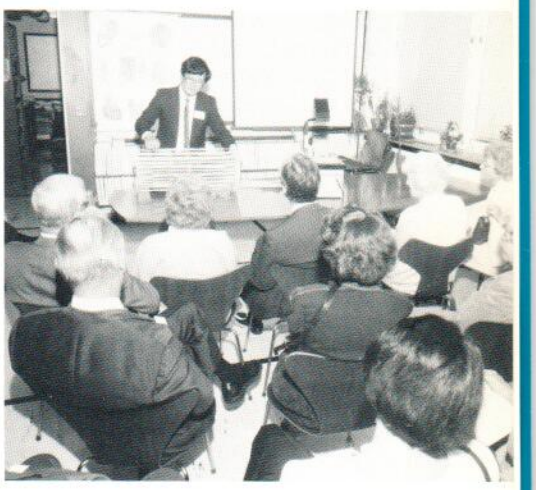
Virginia Cahill
Financial Assistant/Bookkeeper

Computer Services
Walter F. Stafford, III, Ph.D.
Director of Computer Science

Development
Jacquelyn MacL. Findlay
Director of Development

Departmental Administration
Carol G. Burke
Mary Caulfield
Arlene Clark
Angela DiPerri
Dorothy Syrigos

Housekeeping
Maria Bozzella
Constance Giangregorio
Phuong Ngoc Huynh
Lucille Konjoian



Dr. Albert Wang using model to demonstrate muscle function to a group of Trustees and members of the Corporation

BOSTON BIOMEDICAL RESEARCH INSTITUTE
BALANCE SHEETS
AUGUST 31, 1989 AND 1988

	1989	1988
ASSETS		
CURRENT ASSETS		
Cash	$ 1,607,384	$ 1,382,135
Grants receivable	4,013,600	3,741,309
Pledges receivable		255,000
Prepayments, deposits and other receivables	38,863	183,447
Investments, at market value (cost 1989—$3,361,020 1988—$3,128,890) (note 6)	3,791,190	3,092,120
Total current assets	9,451,037	8,654,011
FIXED ASSETS (notes 1 and 2)		
Leasehold improvements	1,935,632	1,935,632
Research equipment	4,369,513	4,067,344
Furniture and fixtures	48,799	48,799
Total	6,353,944	6,051,775
Less accumulated depreciation	4,607,791	4,272,502
Net fixed assets	1,746,153	1,779,273
	$11,197,190	$10,433,284
LIABILITIES AND FUND BALANCES		
CURRENT LIABILITIES		
Accounts payable and accrued expenses	$ 141,930	$ 65,678
Overhead and fringe benefit adjustment payable	34,499	82,842
Deferred grant income (note 5)	4,454,600	4,236,585
Deferred fund (building) (note 5)	115,702	115,702
Total current liabilities	4,746,731	4,500,807
FUND BALANCES (note 1)		
Operating	587,395	810,284
Plant and equipment replacement	2,957,965	2,362,784
Permanent research	574,573	485,584
Fixed assets (notes 1 and 2)	1,746,153	1,779,273
Support of staff members	288,631	244,552
Amelia Peabody staff scientist	295,742	250,000
Total fund balances	6,450,459	5,932,477
	$11,197,190	$10,433,284

See accompanying notes to financial statements.

BOSTON BIOMEDICAL RESEARCH INSTITUTE
STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN FUND BALANCES
FOR THE YEARS ENDED AUGUST 31, 1989 AND 1988

	1989	1988
REVENUES		
Grants	$5,190,189	$5,375,636
Equipment replacement	143,581	106,358
Contributions and pledges		
Unrestricted	185,353	171,211
Restricted	256,458	252,225
Unexpended amount	(146)	(219,251)
Property and equipment purchased (notes 1 and 2)	190,813	96,258
Investment income and appreciation	777,133	(177,649)
Total	6,743,381	5,604,788
EXPENSES (by department)		
Muscle Research	2,284,887	2,250,804
Cell Physiology	1,149,475	1,093,592
Fine Structure	668,334	579,298
Metabolic Regulation	1,018,569	1,243,141
General Research	492,778	218,246
Fund Raising	54,068	43,759
Purchase of fixed assets (note 1)	80,085	42,045
Depreciation (note 2)	335,290	338,338
Write off-subsidiary advances (note 7)	141,913	
Total	6,225,399	5,809,223
NET ADDITION (REDUCTION) TO FUNDS	517,982	(204,435)
Restricted fund donation		240,000
FUND BALANCES, BEGINNING OF YEAR (note 1)	5,932,477	5,896,912
FUND BALANCES, END OF YEAR (note 1)	$6,450,459	$5,932,477

See accompanying notes to financial statements.

BOSTON BIOMEDICAL RESEARCH INSTITUTE
NOTES TO FINANCIAL STATEMENTS
AUGUST 31, 1989 AND 1988

(1) - SIGNIFICANT ACCOUNTING POLICIES

Fund Accounting
The accounts are maintained on the accrual basis and in accordance with the principles of fund accounting. Funds that have similar characteristics have been combined into the following fund groups:

- Unrestricted funds include two groups representing the portion of expendable funds available for support of operations: a) The operating fund includes unrestricted contributions and investment income less the cost of grants not reimbursed in full by granting agencies, and further reduced by transfers to other funds; b) Other unrestricted funds represent amounts segregated from the operating fund for specific purposes, such as a building program fund, staff support and permanent research funds. These funds are designated for specific purposes by internal direction of the trustees.
- Restricted funds represent resources restricted for research grants or building additions. These funds are deemed to be earned and reported as revenues when the Institute has incurred expenditures in compliance with the specific restrictions. Amounts received but not yet earned are reported as restricted deferred amounts (see note 5).
- Fixed assets fund represents the depreciated cost of leasehold improvements, equipment and furniture and fixtures.

Other Matters
All income, gains, and losses arising from the sale, collection, or valuation at market of investments are allocated to the fund owning the assets.

A portion of the overhead chargeable to research grants is deemed to be reimbursement for equipment and is shown as an addition to the Equipment Replacement Fund. This amounted to $143,581 in 1989 and $106,358 in 1988. In addition, $80,085 of equipment was charged to the operating fund in the year ended August 31, 1989, $42,045 in 1988 and added to the plant fund.

(2) - PLANT ASSETS AND DEPRECIATION

The Institute, under an agreement dated June 16, 1970, shares with Retina Foundation the use of research facilities for fifty years at 20 Staniford Street, Boston, and of a research farm in Townsend, Massachusetts.

The leasehold improvement asset category represents the cost of the Institute's long-term leasehold in the building and improvements, and is being amortized over the 50 year lease term. The research equipment and furniture categories represent, at cost, acquisitions from operating funds and restricted research grant awards. Depreciation is primarily on the straight-line basis over the estimated ten year useful life of the assets. All depreciation and amortization is charged to the plant fund.

(3) - GOVERNMENT GRANTS

All grant costs to the U.S. government and most private grants are subject to audit by the granting agency.

(4) - DEFERRED COMPENSATION PLAN

The Institute has a fully funded deferred compensation plan, with funds held by an insurance company as custodian. The assets of the fund and the related deferred compensation liability are not included in the financial statements as they are not intended to be available for operations, but as a segregated retirement fund.

(5) - CHANGES IN DEFERRED RESTRICTED AMOUNTS

	1989			1988
	Building Fund	Grants & Contracts	Total	Total
Balance, beginning of year	$115,702	$4,236,585	$4,352,287	$4,533,444
Additions:				
New grants awarded		5,318,967	5,318,967	4,916,619
Contributions and pledges		256,458	256,458	252,225
Investment income (loss)	20,792	38,605	59,347	(12,326)
	136,494	9,850,615	9,987,109	9,689,962
Deductions:				
Funds expended for designated purposes		5,396,015	5,396,015	5,342,734
Transfer of investment income (loss) from Building Fund	20,792		20,792	(5,059)
Balance, end of the year	$115,702	$4,454,600	$4,570,302	$4,352,287

(6) - INVESTMENTS

Investments consist of corporate and government bonds and listed stocks. Also included is an $800 investment made in 1982 in Boston Biotechnology Corporation. This Company was formed to utilize and commercialize certain technical processes originated at Boston Biomedical Research Institute and elsewhere. The investment holding represents the entire outstanding stock of Boston Biotechnology Corporation and is shown at cost.

(7) - BOSTON BIOTECHNOLOGY CORPORATION

The Institute has advanced $141,913 to Boston Biotechnology Corporation (see note 6). At August 31, 1989, Boston Biotechnology Corporation had developed a product up through a patent. However, since the product is not likely to be marketed in the immediate future, these advances were written off.

INDEPENDENT AUDITOR'S REPORT

Board of Trustees
Boston Biomedical Research Institute
Boston, Massachusetts

I have audited the accompanying balance sheets of Boston Biomedical Research Institute as of August 31, 1989 and 1988, and the related statements of revenues, expenses and changes in fund balances for the years then ended. These financial statements are the responsibility of the Institute's management. My responsibility is to express an opinion on these financial statements based on my audit.

I conducted my audit in accordance with generally accepted auditing standards. Those standards require that I plan and perform the audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. I believe that my audit provides a reasonable basis for my opinion.

In my opinion, the financial statements referred to in the first paragraph present fairly, in all material respects, the financial position of Boston Biomedical Research Institute as of August 31, 1989 and 1988, and the results of its operations and changes in fund balances for the years then ended in conformity with generally accepted accounting principles.

John Vecchi/Certified Public Accountant
124 Crescent Road, Needham, Massachusetts 02194
(617) 449-5545

September 28, 1989

Credits

Articles and Captions
Gail Davison

Design and Production
Furtado Communication Design

Photography

Fay Foto: pages 5, 7, 9, 11, 12, 13

John Ganson: pages 2,3

Tad Goodale: page 10

M.J. Karnovsky: page 4

BOSTON BIOMEDICAL RESEARCH INSTITUTE

20 Staniford Street

Boston, Massachusetts 02114

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