

1992



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A N N U A L R E P O R T



R E S E A R C H T R I A N G L E I N S T I T U T E



Change has always been present in research agendas, but the nation is now going through an unusual degree of change.

RTI has always adjusted to these external changes, and today will be no exception as our staff responds to needs in environmental protection, advanced technology, public health, and social policy.

However, some things must never change, and they include our staff's commitment to excellence in research, high ethical standards, fair and equitable treatment of fellow staff members, and fiscal responsibility.

*Tom Wooten, President
January 1992*

1 9 9 2 R E S E A R C H P R I O R I T I E S



ENVIRONMENTAL PROTECTION

To reduce indoor and outdoor environmental risks, RTI develops and applies methodologies to measure the presence of toxic pollutants, to determine human exposure and health effects, to assess risk, and to optimize strategies to

prevent pollution and reduce risk.

Accurate environmental measurements are key to effective pollution control policies. RTI's staff is at the forefront of developing laboratory and field methods, and quality assurance procedures, for measurements in all outdoor and indoor environmental media.

Toxicologists at RTI conduct fundamental research to identify potentially harmful chemicals.

They use both *in-vitro* and *in-vivo* methods in applied research to prevent human exposure to harmful chemicals.

To identify threats to human health, scientists must determine how chemicals invade human metabolism. This is the role of RTI's research in exposure assessment, which combines chemistry, life sciences, statistics, and biomedical engineering.

Combining the results of measurements, exposure assessment, and toxicology, policy analysts at RTI provide the technical basis for sound decisions on pollution control and prevention. RTI also analyzes economic impacts of pollution prevention options.

RTI has extended its environmental policy and management skills into Eastern Europe by assisting local governments in Poland and Hungary.

Focusing on environmental issues such as acid deposition and indoor air quality, RTI engineers develop new cost-effective technologies for environmental protection. Recent developments include processes to reduce emissions of sulfur, nitrogen oxides, and CFCs.



TECHNOLOGY

New technology can advance competitiveness only if applied to marketplace needs. When RTI's staff members work for industry, they take particular pride in applying the technology, knowledge and experience that results from government-sponsored R&D.

Semiconductor engineers respond to specialized needs with research on materials such as gallium arsenide and synthetic diamond. They develop devices for applications ranging from space photovoltaics to high-speed devices.

Electronics for aerospace, industrial and biomedical applications are of particular interest to RTI's engineers. Current research includes communications technology, signal processing, efficient electric motors, and reliable biomedical devices.

RTI's Surface Cleaning Technology Consortium is helping the electronics industry meet the challenges of manufacturing contamination-free products and eliminating chlorofluorocarbons, solvents that damage the earth's protective ozone layer.

NASA works hard to transfer its technology to meet industrial and consumer needs. RTI plays a key role by identifying unmet needs, seeking relevant government-sponsored technology, and assisting in its application.

RTI develops polymers for performance criteria such as heat resistance. The Institute also is one of the leading centers for development and testing of degradable plastics.



PUBLIC HEALTH

Public health issues include access to health care, quality of care, and resource needs for problems such as AIDS. Behavioral factors that affect exposure to and progress of diseases also are critical. RTI's staff approaches these issues through epidemiology, survey research, medical research, and policy analysis.

For industry and the National Institutes of Health, RTI develops and evaluates new pharmaceuticals, diagnostics, and medical devices.

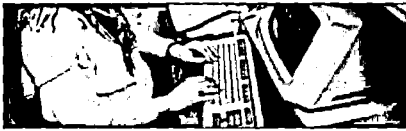
To help fight threats such as cancer, diabetes, AIDS, and violence, RTI designs, implements, and evaluates interventions to encourage healthy personal behaviors and social practices.

RTI develops fundamental national data on issues such as families. RTI conducts surveys and evaluations on issues such as availability, quality, and financing of health care, long-term care, disease prevention, and reproductive decisions.

RTI researches HIV and other retroviruses, conducting epidemiology, clinical research,

evaluations of prevention strategies, needs assessments, and pharmaceutical R&D.

RTI helps developing nations meet public health goals by building effective institutions and infrastructure for water and sanitation, nutrition, health care delivery, and education.



SOCIAL POLICY

For goals such as reduced drug abuse or increased energy conservation, policy analysts seek the most effective use of public

resources to achieve social benefits.

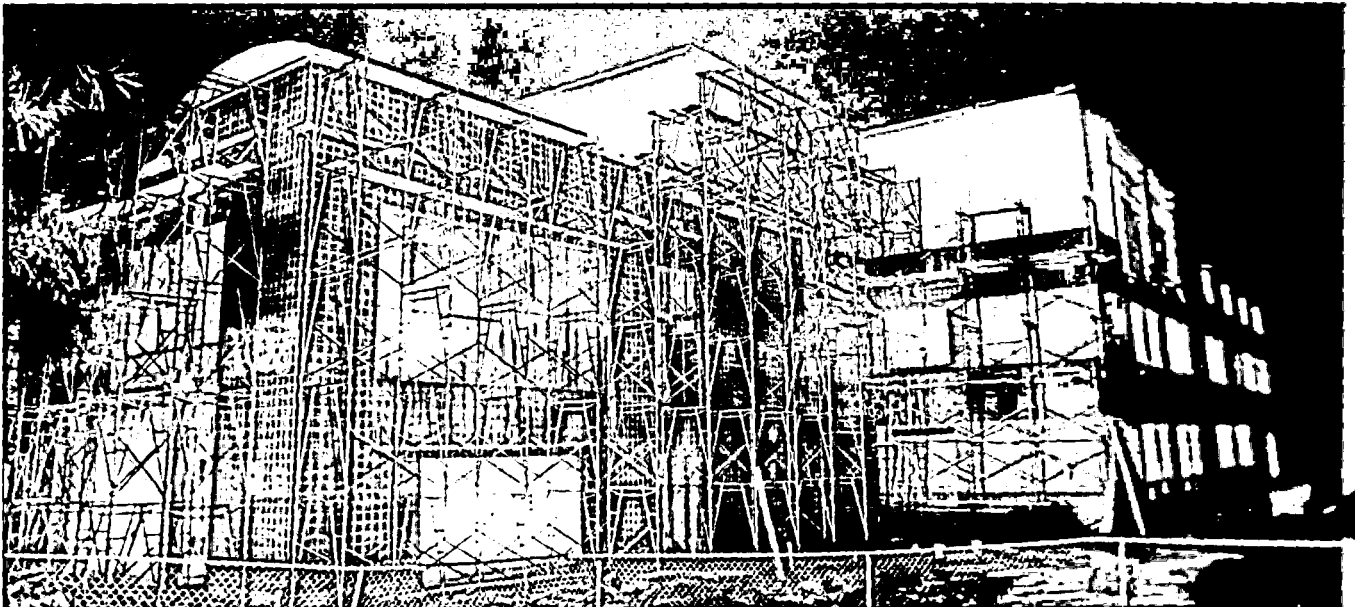
Through applied statistics and social science, RTI determines the extent, nature, context, and causes of alcohol and drug abuse. RTI evaluates intervention and treatment programs; determines impacts on employment and crime; and develops information for prevention, treatment, and enforcement.

Electric utilities promote load management and conservation to reduce needs for costly new power plants. Identifying the best technologies and the best ways to introduce them to customers is the subject of economic, market, and technical research at RTI.

By comparing and evaluating

education initiatives, RTI identifies the most effective approaches to issues such as assistance for children with handicaps, interventions to prevent substance abuse, and education in developing countries.

A new chemistry laboratory building is being added to RTI's 490,000 square foot headquarters facility in the Research Triangle Park.



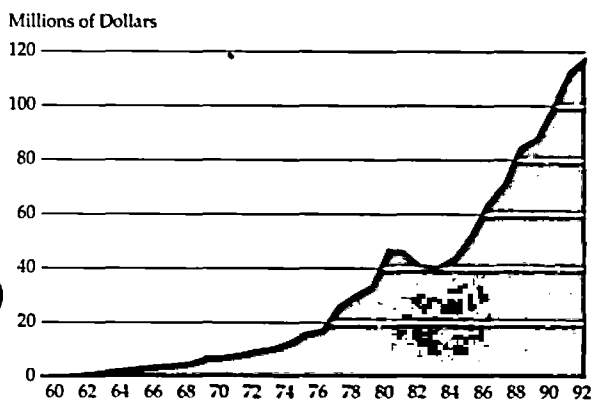
1992 OPERATING HIGHLIGHTS

RTI's revenue rose in 1992 to a record \$118 million, 4.6% higher than in 1991. Stability is expected in 1993, based on new research funding acquired in 1992.

RTI's diversity of clients is indicated by the variety of sources of revenue and by the range of industries represented among private-sector clients (see charts).

The US Department of Health and Human Services continues to be the largest source of research funding for RTI, with research billings of \$50 million. The bulk of this work is in response to public health issues such as drug abuse, AIDS, long-term care, cancer, heart disease, and healthy lifestyles.

Research Revenue



The Environmental Protection Agency remains one of RTI's most important clients, accounting for 16.6% of the Institute's activity in 1992 (up from 14.1% the previous year). RTI's interest in environmental issues is long-standing, and this commitment is expected to continue. Research for industry continued a pattern of strong growth that dates back a full decade, accounting for 13.5% of RTI's 1992 activities. Since 1982, RTI's industrial research has grown six-fold. This work gives RTI scientists opportunities to meet marketplace needs by applying the knowledge and experience gained in federally funded research. This fact, and the healthy diversity of the private-sector client base, means further growth can be expected in this important business segment.

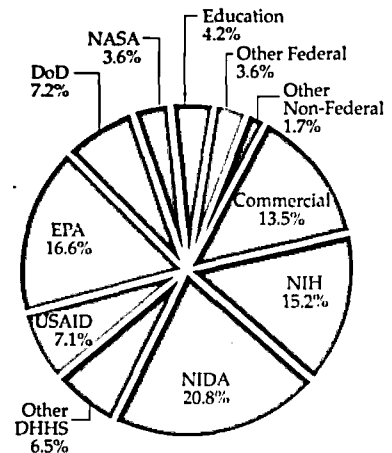
Support from the Department of Defense grew to \$8.5 million, from \$7.8 million the previous year. Other important sources of revenue include the US Agency for International Development, the US Department of Education, and NASA. A variety of non-federal sources supplied 1.7% of RTI's revenue.

During 1992, the regular staff grew from 1,435 to 1,523. Offices in the District of Columbia, Virginia, Florida, and overseas continued to expand and now include nearly 150 people.

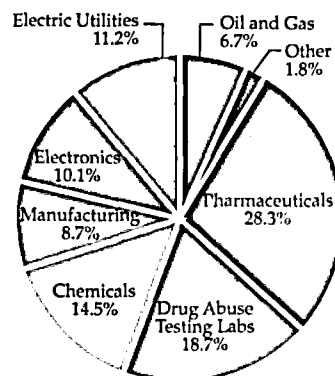
Construction continued in 1992 on a new 58,850-square-foot chemistry building, to be completed in March 1993. In addition, renovation of existing chemistry laboratories in the Hermann Building was planned and will take place in 1993. With other completed or ongoing laboratory renovation projects, RTI is expected to end 1993 with 150,000 square feet of chemistry laboratories, of which 75% will be new or newly renovated.

RTI's physical plant totals 490,000 square feet (plus the new chemistry laboratory) in the Research Triangle Park area, and 20,000 square feet at other locations.

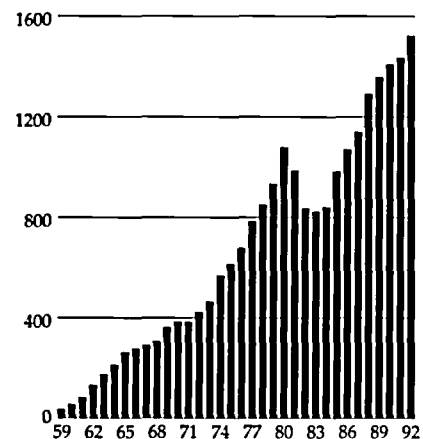
Sources of Revenue



Private Sector Revenue



Staff Growth



RESEARCH ORGANIZATIO

Board of Governors
Executive Committee
|
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|
Alvin M. Cruze, Executive Vice President

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Statistical Sciences

W. Kenneth Poole
Biometrics Research

Ronald W. Johnson
Social Sciences and
International Development

C. Edgar Cook
Chemistry and Life Sciences

Edo D. Pellizzari
Analytical and
Chemical Sciences

James B. Clary
Electronics and Systems

James B. Tommerdahl
Environmental Sciences
and Engineering

Research Centers and Programs

Research in Statistics, Robert E. Mason, director
Survey Research, Thomas G. Virag, acting director
Survey and Research Computing, Margo F. Brinkley, acting director
Survey Methods Research, Paul P. Biemer, acting director
Ragland Computer Center, James C. Wright, director
Chief Scientist: Ralph E. Folsom, Jr.

Epidemiologic and Medical Studies, Fred A. Bryan, Jr., director
Medical, Environmental and Energy Statistics, Tyler D. Hartwell, director
Computer Applications, Robert H. Thornton, director
Chief Scientist: B. V. Shah

International Development, Jerry VanSant, director
Policy Studies, Janet D. Griffith, director
Social Research and Policy Analysis, J. Valley Rachal, director
Economics Research, Allen K. Miedema, director
Research in Education, John A. Riccobono, director
Chief Scientist: George H. Dunteman

Organic and Medicinal Chemistry, F. Ivy Carroll, director
Life Sciences and Toxicology, Frederick J. de Serres, director
Bioorganic Chemistry, A. Robert Jeffcoat, director
Polymer Sciences, Anthony L. Andrady, program director
Chief Scientist: Monroe E. Wall
Camille Dreyfus Scientist: Vivian T. Stannett

Methods Development and Applications
Mass Spectrometry
Applied Analytical Systems, Charles M. Sparacino, director

Digital Systems Research, James N. Brown, Jr., acting director
Systems Engineering, James G. Haidt, director
Semiconductor Research, James A. Hutchby, director
Technology Applications, Doris J. Rouse, director
Biomedical Engineering, Russell C. Eberhart, program director
Neuroscience, Blake S. Wilson, senior program director
Chief Scientist: James N. Brown, Jr.

Environmental Measurements and Quality Assurance, Clifford E. Decker, director
Environmental Analysis, Dennis F. Naugle, director
Aerosol Technology, David S. Ensor, director
Process Research, James J. Spivey, director

GOVERNANCE AND CORPORATE OFFICERS

Board of Governors

Of the 31 Governors: five hold seats by virtue of their positions: the presidents of The University of North Carolina, Duke University, and the Research Triangle Institute, and the chancellors of NC State University and the University of North Carolina at Chapel Hill; four are specified in the Bylaws: George Watts Hill, William C. Friday, George R. Herbert and Marcus E. Hobbs; nine are appointed annually to represent Duke University, The University of North Carolina general administration, NC State University, and UNC-Chapel Hill; up to 15 Governors are elected from the business and professional communities.

Chairman:

Earl Johnson, Jr.,* Chairman, Southern Industrial Constructors, Inc., Raleigh

Vice Chairman:

George R. Herbert,* President Emeritus, Research Triangle Institute

Executive Committee Chairman:

Marcus E. Hobbs,* University Distinguished Service Professor Emeritus of Chemistry, Duke University

Chairman Emeritus:

George Watts Hill,* Chairman of the Board, Central Carolina Bank and Trust Company, Durham

John C. Bailar, III, Professor, Epidemiology & Biostatistics, McGill University

Erich Bloch, Distinguished Fellow, Council on Competitiveness, Washington, DC

H. Keith H. Brodie, President, Duke University

Norman L. Christensen, Jr.,* Dean, School of the Environment, Duke University

Ivie L. Clayton,* Business Consultant, Raleigh

Pedro Cuatrecasas, President, Pharmaceutical Research Division, Warner-Lambert Co., Ann Arbor, Michigan

William C. Friday, President, William R. Kenan, Jr. Fund, Chapel Hill

Pamela B. Gann, Dean, School of Law, Duke University

Steve C. Griffith, Jr., Executive Vice President and General Counsel, Duke Power Company, Charlotte

Paul Hardin, Chancellor, University of North Carolina at Chapel Hill

Margaret T. Harper,* President, The Stevens Agency, Southport

Franklin D. Hart,* Provost and Vice Chancellor, North Carolina State University

H. Garland Hershey,* Vice Chancellor for Health Affairs, University of North Carolina at Chapel Hill

William G. Howard, Jr., Consultant, Scottsdale, Arizona

William L. Klarman,* Interim Vice Chancellor for Research and Extension, North Carolina State University

Matthew Kuhn, President, MCNC, Research Triangle Park

William F. Little,* Vice President for Academic Affairs and Senior Vice President, The University of North Carolina

Richard L. McCormick,* Provost and Vice Chancellor for Academic Affairs, University of North Carolina at Chapel Hill

Eugene J. McDonald, President, Duke Management Company

Larry K. Monteith, Chancellor, North Carolina State University

Charles E. Putman*, Executive Vice President for Administration, Duke University

Thomas A. Rose, President, Blue Cross and Blue Shield of North Carolina, Durham

C. D. Spangler, Jr., President, The University of North Carolina

Thomas J. Troup, Vice Chairman, Burr-Brown Corporation, Tucson, Arizona

Charles B. Wade, Jr., Winston-Salem

F. Thomas Wooten,* President, Research Triangle Institute

Phail Wynn, Jr., President, Durham Technical Community College, Durham

Members of the Corporation

The Members are the equivalent of RTI shareholders. As such, they elect the Governors who represent the business and professional communities. Of the nine Members of the Corporation: four are the chairmen and presidents of The University of North Carolina and Duke University; one is George Watts Hill, a lifetime Member of the Corporation; four are elected annually, two from and by the Duke University Board of Trustees, and two from and by the Board of Governors of The University of North Carolina.

Members of the Corporation representing Duke University are: P. Jackson Baugh, Nicholasville, Kentucky; H. Keith H. Brodie, Durham; John A. Forlines, Jr., Granite Falls; Thad B. Wester, Raleigh.

Members of the Corporation representing The University of North Carolina are: Samuel H. Poole, Raleigh; T. Henry Redding, Asheboro; Hon. Robert W. Scott, Haw River; C.D. Spangler, Jr., Chapel Hill.

Corporate Officers

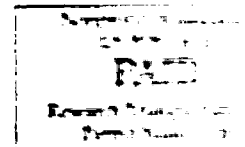
RTI officers, including the research vice presidents listed on the opposite page, are elected by the Board of Governors.

F. Thomas Wooten, President
Alvin M. Cruze, Executive Vice President
William H. Perkins, Jr., Financial Vice President
Rick C. Sisson, Treasurer
Woody H. Yates, Assistant Treasurer
Walton J. O'Neal, Controller
Suzanne P. Nash, Corporate Secretary
Carolyn J. Harris, Assistant Corporate Secretary

*Member, Executive Committee

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A N O V E R V I E W O F R T I

Research Triangle Institute is an independent not-for-profit contract research organization located in the center of North Carolina's Research Triangle Park. RTI was established in 1958 by the University of North Carolina at Chapel Hill, Duke University, and NC State University.

RTI conducts applied and basic research in the United States and abroad for clients in government, industry, and public service.

Organization and Staff

RTI's organization supports multidisciplinary teams to address complex research issues.

The staff of more than 1,550 includes 60 percent professionally-trained research personnel. Of these, two-thirds have advanced degrees. Their backgrounds include more than 115 degree fields.

Staff training and experience include:
Social Sciences: economics, econometrics, benefit-cost analysis, evaluation research, urban and regional planning, international development, health services and health policy research, agricultural development, sociology, psychology, social psychology, education, business administration, public administration, municipal financial management, criminology, law, political science, and the humanities.

Survey Research: sample design and selection, survey planning and execution,

data collection and management, and research and development on survey methodology.

Mathematics, Statistics, and Computer Sciences: data management and analysis, statistical methods development, statistical analysis, biostatistics, clinical trials, epidemiology, computer-aided engineering, CAD/CAM, systems software, software verification, computer security, numerical modeling, and operations research.

Environmental Sciences and Engineering: environmental controls and engineering, environmental chemistry, environmental health, industrial hygiene, hazardous materials management, hydrogeological and earth and mineral sciences.

Chemical and Biological Sciences: analytical, organic, inorganic, physical, polymer, and medicinal chemistry; toxicology, pharmacology, genetics, neuroscience, biology, biochemistry, and microbiology.

Engineering and Physics: electrical, electronic, systems, computer, semiconductor, chemical, biochemical, energy, industrial, mechanical, materials, biomedical, aerosol, civil, petroleum, nuclear, aeronautical, and transportation engineering.

University Affiliations

RTI was created as the first scientific organization of North Carolina's Research Triangle Park, a science park built around the resources of three universities.

RTI's capabilities are greatly enhanced by frequent collaboration with university scientists. There are joint staff assignments, cooperative research programs, and other professional contacts.

Laboratory and Office Facilities

RTI's campus includes 400,000 square feet of laboratory, computer, and related facilities. RTI also maintains research offices in Washington, DC; Hampton, VA; Cocoa Beach, FL; and at project locations in the US and abroad.

Computer Facilities

In-house facilities for data management and analysis, modeling software, CAD, computer-aided engineering, and laboratory management include networks of microcomputers, a computer center, and daily traffic with national and regional scientific networks.

Library Facilities

RTI's Technical Information Center provides on-line literature searches and maintains subscriptions to more than 1,000 professional periodicals. Specialized libraries are maintained in RTI research buildings.

RTI staff have access to the libraries of the nearby universities, which have been cross-cataloged since 1984. Access is facilitated by computerized catalog files and daily truck service.