

1969



DUKE UNIVERSITY
DURHAM

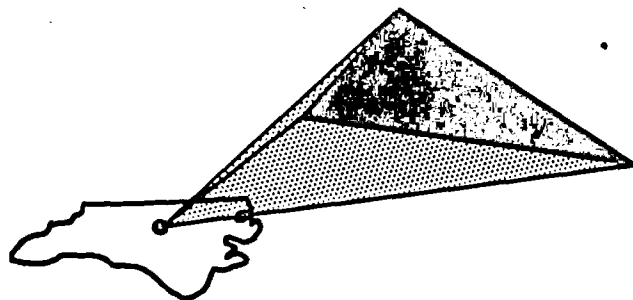


RESEARCH
TRIANGLE
PARK

N. C. STATE UNIVERSITY
RALEIGH

UNIVERSITY OF N. C.
CHAPEL HILL

RESEARCH TRIANGLE INSTITUTE



RESEARCH TRIANGLE INSTITUTE
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1969
Report of Progress

OPERATIONS

○ Ending its first full decade of operations, Research Triangle Institute recorded new highs in all categories of activity.

○ In 1968 RTI's staff worked on 163 separate research assignments for federal, state, and local government agencies, foundations, and industrial clients ranging from local companies to national corporations.

○ Research volume totaled \$5.4 million for the year.

○ Cumulative totals over ten years show 440 projects completed or in progress, and research revenues exceeding \$26.5 million.

○ Permanent staff rose to over 350 professional, technical, and support personnel by year's end. Sixty per cent of the staff is professionally trained, and of this number approximately 40 per cent hold the Ph.D. degree. More than 40 different degree fields are represented on the staff.

○ Investment in facilities and research equipment increased to \$3.6 million. The new services being offered by RTI's regional mass spectrometry center were used for a variety of research and training purposes by the Triangle Universities, and are being made available to other colleges and universities throughout North Carolina and in adjoining states.

○ Founding Contributors and RTI Associates programs provided substantial gains towards the Institute's long-range growth goals. A major step occurred with approval of architect's preliminary plans for a million-dollar, 30,000-square foot Chemistry and Life Sciences Laboratory building to be completed by 1972.

○ Work began in 1968 on the Institute's largest single project and one of its most important, a \$2 million sampling analysis and survey to aid in an assessment of educational progress being made in the nation's schools. Research effort also expanded in established fields such as civil defense, polymer science, reliability and systems engineering, natural products chemistry, industrial processes, information handling, transportation, and regional development and planning. Health-related research continued to be the area of greatest attention and growth in all Institute divisions. Current research in progress covers health economics and health statistics, medical services and health care systems, drug metabolism, medicinal chemistry, pharmacology, air pollution, medical polymers, and biomedical engineering.

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CHEMISTRY AND LIFE SCIENCES LABORATORY

Dr. Monroe E. Wall, Director

The Chemistry and Life Sciences Laboratory includes chemists and life scientists working together on the application of novel and sophisticated techniques to the study of physiologically active compounds present in minute quantities. Major advances have been made in cancer chemotherapy and drug metabolism studies.

Extensive programs are pursued in the study of biologically active compounds, with particular emphasis on isolation, structure determination, and synthesis. The application of organic chemistry to the solution of biological problems is a major interest for which excellent research facilities are provided.

Specialties include the metabolism of drugs and agricultural chemicals; cancer chemotherapy; synthesis of radio-labeled compounds not commercially available; neuropharmacology, cardiovascular pharmacology, and applications of modern physico-chemical techniques to problems in toxicology.

Activity within the Laboratory's closely inter-related areas of research interest covers

- Production of new, structurally modified steroids, and testing them for hormonal and anti-tumor properties
- Isolation, identification, and synthesis of plant anti-cancer agents
- Synthesis and metabolism of new anti-malarial agents
- Studies on environmental health and toxicology
- Novel approaches to drug metabolism using modern instrumentation methods
- Applications of mass spectrometry to the solution of chemical and biological problems

The Institute's mass spectrometry center, one of only about a dozen similar installations in the United States, is operated by the Chemistry and Life Sciences Laboratory in conjunction with graduate departments of the Triangle universities. The Laboratory also maintains an animal colony for the evaluation of biologically active substances.

CAMILLE DREYFUS LABORATORY

Dr. Anton Peterlin, Director

RTI's Camille Dreyfus Laboratory is an international center for studies in the physics and chemistry of polymers.

The Laboratory was created by an initial \$2.5 million grant from the Camille and Henry Dreyfus Foundation to commemorate the achievements of Dr. Camille Dreyfus, a pioneer in polymer-based industrial development. In addition to Foundation funding, sustaining support is also received from corporate and government research sponsors.

The Camille Dreyfus Laboratory's general program is geared to basic scientific studies that stress research relating to the synthesis and modification of polymer structures, and to pure property investigations. Polymerization, kinetics, synthesis of polymers with specific physical properties, plastic deformation, mechanical properties, and fiber morphology are among the main fields of investigation. Research results are widely published in leading scientific journals.

In addition to its basic general program, the Laboratory also undertakes specific research projects for individual companies.

A number of project assignments are moving the Laboratory into broad new subject areas. These include studies of electronic processes in polymer solids, research on the rheology of polymer solutions, development of improved membranes for reverse osmosis, and research on the structure and properties of cotton and wool fibers. Studies on blood compatibility of polymeric materials, and continuation of research on new materials for hemodialysis membrane systems, signal an expansion of the Laboratory's work in medical polymers.

The Laboratory's programs benefit from the guidance of an international scientific advisory committee, and from associations with visiting foreign scientists and post-doctoral fellows who receive six-month to two-year appointments at the Institute. RTI's Camille Dreyfus auditorium is the site of a distinguished lecturer series presented on a regular basis and attended by scientists from throughout the Triangle area.

STATISTICS RESEARCH DIVISION

Dr. A. L. Finkner, Director

The science of statistics provides increasingly effective techniques and tools for use in all fields of scientific research and in development, production, and planning activities.

Throughout business, industry, government, and public service agencies, the growing complexity of technical and planning operations has created an increasing demand for improved methods of collecting and analyzing information for program evaluation, and for accurate forecasting techniques. Continual advances in statistical methodology and theory, and their imaginative application, are required to meet this demand.

At RTI, statisticians use their creative talents to develop quantitative techniques in experimental design, sampling, statistical theory, and mathematical and statistical modeling to describe relationships in physical, biological, ecological, and social systems. Research performance often combines the skills of statisticians and mathematicians with those of engineers, economists, biologists, and social scientists.

Staff resources and program development fall within several broadly based research groups:

Educational Statistics	Social Statistics
Environmental Statistics	Survey Statistics
Population Statistics	Systems Statistics
Statistical Methodology	

Major areas of activity include:

—A coast-to-coast sampling study and educational survey of unprecedented scale to provide benchmark data for an assessment of how much the nation's schoolchildren are learning

—Continuing emphasis on the application of microsimulation and other modeling techniques to population studies, vital rates analysis, and family planning evaluation

—Sampling and data collection methodology, social surveys, program evaluation

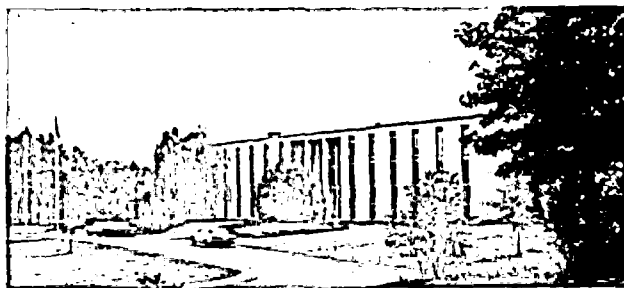
—Biostatistics, health care resources, environmental effects, and medical research design

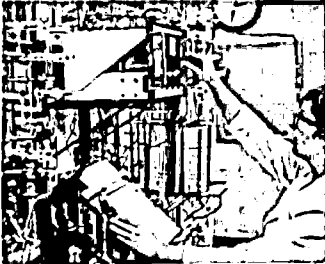
—Systems reliability, theory of traffic flow, cost-effectiveness methodology

—Industrial reliability, theory of traffic flow, cost-effectiveness methodology

—Industrial processes, quality control, production management

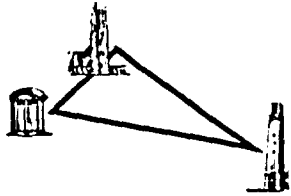
—Studies in the theory of mathematical statistics





RTI's research operations are organized
into five multidisciplinary groups. . .

RESEARCH OFFICES



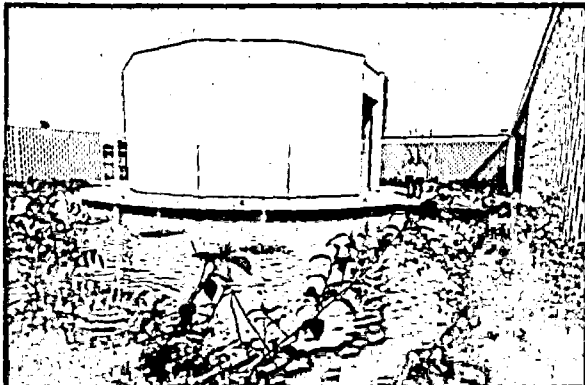
UNIVERSITY AFFILIATION

RTI's place in the Triangle university family is its greatest asset, and strong university orientation is a distinctive feature of RTI operations. University faculty members and department heads from all three campuses have assisted in planning and developing Institute research programs. Many of them frequently and routinely participate in RTI project work. Relationships among the four institutions include consulting agreements, joint staff appointments, the mutual support of research on a subcontract basis, and attendance at numerous lectures, seminars, and other professional and social events.

In addition to regular graduate department contacts, RTI benefits from close ties with university Schools of Medicine, Public Health, and Dentistry, and with others in the university research community including the Carolina Population Center, Institute of Government, Institute of Social Science Statistics, Industrial Extension Service, and the Duke Marine Laboratory.

Located near RTI in the Research Triangle Park, the Triangle Universities Computation Center operates an IBM 360/75 linking the colleges and universities of North Carolina in the largest computer network of its kind in the United States. RTI schedules time on the TUCS system for many projects, and also maintains its own research computer center with full-time staff.

The libraries of the three universities are of prime importance to RTI. Cross-indexed and readily available to the Institute staff, their combined collections total five million volumes.



Area development and economic planning programs in the North Carolina region embrace a wide range of state and federal objectives. A separate **Regional Development and Planning Office** has been established to provide leadership and coordination for the Institute's numerous interests in this field. Working with state government offices, federal agencies, and other groups representing the southeastern region, RTI is providing research assistance in formulating economic development strategies, in educational and recreational planning, manpower and natural resource development, analysis of population characteristics and growth patterns, socio-economic surveys, and information systems design. The office also offers guidance and supporting assistance to clients in developing and carrying out their own research to meet specific needs.

A statewide service to aid individual North Carolina companies in solving their technical problems, RTI's **Office of Industry Services** calls upon staff and equipment resources throughout the Institute to provide quick, effective assistance to firms which may not have sufficient technical capability to meet a special need. To supplement RTI's resources, clients are also referred to university faculty members, to other research organizations, or to consulting firms and commercial testing laboratories. Technical assistance requests involve a great variety of problems and solutions. Some can be handled by telephone or personal interview, some by brief visits to plant, shop, or office, and others may require several hours or days of laboratory effort.

Engineering analysis in RTI's **Chemical Processes Group** emphasizes the application of fundamental concepts of transport phenomena, reaction kinetics, and equilibrium data to descriptions of physical and chemical processes. Mathematical models are incorporated into systems studies for determining the behavior, economics, and design criteria of chemical production processes, as well as processes relating to air pollution, water pollution, waste disposal problems, and other environmental and health areas.

FOUNDING CONTRIBUTORS AND ASSOCIATES

RTI's Founding Contributors and Associates program is a means by which corporations, foundations, individuals, and other contributors participate in the Institute's growth. As a scientific asset created in a planned, statewide program aimed at strengthening North Carolina's economy, it was recognized from the beginning that a not-for-profit organization such as RTI would require outside financial resources to provide buildings and facilities and to support staff expansion and program development.

Initial funding of \$500,000 for start-up operations was provided by the Research Triangle Foundation from contributions made by corporations and individuals throughout the state. Subsequent major contributions have included a grant of \$2.5 million from the Camille and Henry Dreyfus Foundation, three equipment grants from the State of North Carolina totaling \$700,000, and large personal gifts and pledges from Mr. Grover M. Hermann and Mr. George Watts Hill. All are designated as Founding Contributors of the Institute in recognition of gifts of \$100,000 or more.

Smaller amounts in the form of special gifts and annual contributions have been received from a growing number of RTI Associates.

Founding Contributors

Research Triangle Foundation
State of North Carolina
Camille and Henry Dreyfus Foundation
Mr. Grover M. Hermann
Celanese Corporation of America
Mr. George Watts Hill

RTI Associates*

Alma Desk Company
BASF Corporation
Burlington Industries Foundation
Central Carolina Bank and Trust Company
Chemstrand Research Center, Inc.
Mr. George Watts Hill
Mr. John Sprunt Hill
Liggett & Myers, Inc.
Martin Marietta Corporation
Herbert T. and Ollie Randall Foundation
Southland Associates

*As of February 28, 1969

ORGANIZATION



Research Triangle Institute is a not-for-profit research organization created as the focal point of North Carolina's Research Triangle, a national scientific center built on the resources of the region's three major universities—the University of North Carolina at Chapel Hill, Duke University in Durham, and North Carolina State University at Raleigh.



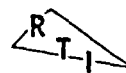
The Institute's campus is centrally located within the 5,000-acre Research Triangle Park midway between the three schools. The Park has also been selected as a site of operations by 18 other industrial and government organizations. Existing laboratories and technology-oriented activities in the Park have a current combined employment of 5,400. During 1968 three major firms announced plans to locate health-related research activities near RTI in the Park. Other new Research Triangle Park neighbors include the National Institute of Environmental Health Sciences, National Center for Health Statistics, and National Air Pollution Control Administration.



Established as an independent corporate entity by the Triangle universities, RTI operates under a separate Board of Governors and with its own full-time staff. Twelve of the Institute's 25 Board members are academic officials, and close university affiliation is further assured through working relationships at many levels.



RTI provides research services to its clients on a contract basis. Contracts typically originate from preliminary discussion between the potential sponsor and senior RTI staff members. Specific research proposals are then prepared by an RTI project team and approved by RTI management. Each proposal contains an outline of work including technical staff assignments, duration, and estimated cost.



Close contact is maintained with sponsors through frequent meetings and informal communications, as well as through regular written reports. Contract work is held in any degree of confidence the sponsor may desire.