

NTID focus

Publication of the National Technical Institute for the Deaf
at Rochester Institute of Technology, Rochester NY 14623
Summer 1981



RESEARCH

National Technical Institute for the Deaf at Rochester Institute of Technology



NTID is mandated by the federal government to conduct research into the occupational and employment-related aspects of deafness and to develop and evaluate new and imaginative instructional technology for application in the education of deaf students at RIT and elsewhere.

Toward these ends, NTID conducts research in three major areas: communication assessment and training; education and cognition; and graduate accommodation.

Benefits derived through communication research have been improved communication skills of our students, providing them with the opportunity of achieving success in personal/social growth and development, the academic learning environment, and professional endeavors. Research has resulted in auditory speech perception tests for accurate placement of students into communication courses, procedures for identifying reading and writing skill levels, speech and voice disorders, and sign language skills; and in the development of materials for improving reading and writing skills, manual/simultaneous communication abilities, functional skills in audition and speechreading, and speech and voice production.

Benefits derived through educational research have been the development of ways to improve the teaching/learning process for deaf individuals. Many research activities focus on making the deaf student an independent, active learner. In the interpersonal skills area, research is done to help deaf students better understand their strengths, weaknesses, and goals, and how they relate to other people. Interests include the impact of important people on one's life, personal characteristics, career preferences, and the impact of deafness.

Research regarding graduates of NTID at RIT involves evaluating how successful NTID has been in preparing deaf youngsters for successful employment, monitoring the changing characteristics of deaf people nationally, and monitoring the changing characteristics of the job market nationally. These activities bring us greater understanding about the relative and comparative success of graduates, identifying program characteristics which contribute to this success, and providing information to reinforce successful efforts.

We have every reason to believe that many benefits accrue to us and to others as a result of the research program we undertake; and this issue of Focus is designed primarily to highlight that program.

William E. Castle

Dr. William E. Castle
Vice President of Rochester
Institute of Technology
Director of the National Technical
Institute for the Deaf



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NTID Focus is published by the Public Information Office at the National Technical Institute for the Deaf and Communications at Rochester Institute of Technology, Rochester, New York.

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With the establishment of the RIT Research Corporation during 1980, it is predictable that we will witness a greater involvement in research by Rochester Institute of Technology (RIT) during the 1980s than has ever been true in the past. As is the case with the program of research that has been underway for some time within the National Technical Institute for the Deaf at RIT, research sponsored by the RIT Research Corporation will be applications research, with initial concentrations on graphic arts, energy, and communication. The first concentration will be managed through an expansion of the efforts of the Graphic Arts Research Center as an integral part of the Corporation now called the Graphic Arts Division; the second concentration is underway through a newly established Energy Division; and the third concentration is to be underway soon through a Communications Division.

We at RIT look to the Research Corporation as a place where faculty of the RIT colleges may find opportunities to supplement or to replace, on a temporary basis, their teaching activities by having a chance to spend time on special research projects. Obviously, we hope that the researchers and other faculty of NTID will take advantage of these opportunities, which in every instance offer potential for renewal and for professional development. We are also hopeful that the presence of deafness on the Rochester campus and the already strong program of research within NTID can serve as a base for obtaining contracts from business and government for supporting some of the efforts of the Corporation. Certainly, all of us look forward to this total venture beginning with a great pride in what is already underway.

Dr. M. Richard Rose
President of Rochester Institute of
Technology

This material was produced through an agreement between Rochester Institute of Technology and the U.S. Department of Education.

RESEARCH:

Responding to a Challenge



“The Institute should be organized to investigate problems having to do with the social, educational, and economic accommodations of deaf people, including evaluation and improvement of teaching techniques as they relate to the educational goals of all deaf students wherever taught.”

When the Department of Health, Education, and Welfare (DHEW) formulated guidelines for the National Technical Institute for the Deaf (NTID) in 1966, it issued a significant mandate for research, building it into the very fabric of the newly formed Institute.

Nearly 15 years later, researchers at NTID can be proud of what they have achieved. Studies of a broad range of problems have been conducted in an effort to seek answers, facilitate learning, minimize social difficulties, and help ensure students' success in chosen career areas.

Research is not a separate entity at NTID. It has three major components, each part of a broad program within the Institute, each with its own responsibilities and goals. **Communication Research** functions within the Communication Program; **Educational Research** is part of the Educational Support Services Division; and **Institutional Research** is part of Management Services. In addition, the Office for **Integrative Research** deals with Institute problems that cut across all departments or those which have implications for other institutions.

Research is not limited to the work done solely by researchers. Many projects are conducted by teaching faculty as they look for better ways to get their message across to students.

COMMUNICATION RESEARCH

Directed by Dr. Robert Whitehead, associate professor and chairperson, Communication Research has three principal components: investigation of communication characteristics of the hearing impaired and why problems exist; development of prototype materials and strategies to assist in the diagnosis and treatment of these problems; and implementation and evaluation of the prototype materials.

“Students may demonstrate problems with speech, language, or visual processing in addition to their auditory deficiencies,” Dr. Whitehead explains. “Once we identify specific communication characteristics, it is necessary to investigate why they exist. This question is often the most difficult to answer, but it is vital because it provides us with data to use in the development of training materials for improving communication skills.”

When developing prototype materials to aid in assessment and training, close cooperation between researchers and instructors is essential.

“Usually the researcher and the instructor have been in communication with one another from the beginning,” Dr. Whitehead says, “but when it's time to develop materials, it's essential that they work together if the materials are to be meaningful and, therefore, applicable. The instructor must have direct input relative to whether or not the materials are realistic, the ways in which they may be modified, and the format in which they should exist.”

Materials are then implemented and their effectiveness assessed. Modifications may occur based on the evaluation data.



Dr. Robert Whitehead

"All research projects eventually must have an impact on the NTID population in terms of assessment or training of communication skills," says Dr. Whitehead, "so researchers conducting projects within the investigative area are expected to follow their findings through to the implementation stage."

Dr. Whitehead points out that, historically, very little research has been conducted with respect to the communication characteristics of the deaf.

"Through our integrated approach to research and instruction within the Communication Program, however, not only are questions being answered relative to the reasons for communication deficits, but effective training programs are being developed to improve the communication skills of the deaf and thereby increase their potential for personal/social, academic, and professional success."

EDUCATIONAL RESEARCH & DEVELOPMENT

"The efforts of this department can be characterized as a scientific approach to converting educational research findings into improved school practice," says Dr. Gary Long, assistant professor and department chairperson. "We recognize that our top priority is research for the benefit of RIT's hearing-impaired students."

The department's research is concentrated in five areas: cognition and learning, interpersonal skills, career education, psychological assessment, and mainstreaming.

To strengthen the ties between researchers and teaching faculty,

data are gathered from classes for study by both. Students are involved via course evaluation forms developed by the department for use by instructors and researchers.

"Research on instructional processes and learning strategies is important if we are going to help classroom teaching and student learning become more effective," Dr. Long stresses.

Many of the department's research and development activities focus on helping the student become an active and independent learner. For example, researchers have developed a technique called "networking" which is used to teach deaf students how to process text material more effectively. Important ideas are selected from the text and students are shown how those ideas are inter-related via diagrams. This helps students improve their comprehension of text material.

Since the department recognizes the importance of interpersonal skills, researchers have developed and evaluated a package of materials to help students better understand their strengths, weaknesses, goals, and interpersonal relationships.

Research in the educational and psychological assessment areas centers on improvement of testing procedures.

"We're looking at ways to revise and develop new assessment procedures which can be used with deaf individuals," Dr. Long says. "In the course of psychological testing, we discovered that deaf students manifest certain behaviors that reflect nothing more than the difference between the way hearing and deaf persons *interpret* certain stimuli."

Looking ahead, Dr. Long has two immediate goals in mind. "Reading comprehension has been shown to be the best predictor of academic achievement. I'd like to see us develop some new techniques to help students improve their reading comprehension, so we have formed a task force to study reading-related processes. We hope that someday NTID will have its own reading center to aid students here and nationally with this complex process.

"I also feel that some of our ideas, such as the interpersonal skills manual and "networking," could be adapted for use on the primary and secondary levels. Our immediate responsibility is to deaf RIT students, but our ultimate charge is to influence and improve the education of *all* deaf students, wherever they may be."

INSTITUTIONAL RESEARCH

"Evaluation is the primary focus of this department," says Charles Parker, department manager. "We document NTID's successes and look for ways to become more successful, both as an institution and as a program."

When the eight basic responsibilities were outlined for NTID by DHEW, one was promoting successful employment of deaf people. This department measures that success through monitoring RIT's deaf graduates in employment. Are they succeeding in their work? Do they get along well with their co-workers? Are they moving up through the ranks?

To answer these questions, Institutional Research looks into four broad areas: institutional evaluation, program evaluation, futures research, and information dissemination.

"In institutional evaluation, we look at broad indicators of success, particularly where graduates are concerned," Parker says. "We check to see if they are in the labor force, the levels at which they are placed, and in what types of occupations and careers they are employed."

Program evaluation studies specific academic programs and their contributions to the overall success of the Institute.

"We might take a particular program and compare the relative success of its graduates with those of other programs," Parker explains. "We try to evaluate how well our graduates meet the specific needs of the labor market; we also look at a program's costs and benefits."

Futures research studies the changing occupational demands of the labor market, using 10-year projections by the federal government. With these figures, the Institute can plan new programs, decide which existing ones may not be viable in the future, and consider where to shift resources in response to the labor market.

Futures research also looks at changing characteristics of the deaf population in general, the impact of mainstreaming legislation, and shifting characteristics of deaf students in residential programs and how these characteristics affect NTID.

Finally, the department disseminates information about its research findings to various external publics,



Charles Parker

including professionals serving the deaf and other handicapped clientele. Consulting support is also provided for outside groups.

"I find it very satisfying to discover that our research has reinforced the critical importance of research being done under the leadership of Drs. Long and Whitehead," Parker adds. "For example, more than 72 percent of our graduates work in an environment where there are no other deaf people, and about 95 percent use the spoken word as their primary mode of communication on the job. Consequently, the whole area of communication becomes very important,

particularly as our graduates begin to move out of technical, entry-level positions and into management or supervisory roles."

Parker's research also indicates that personal and social development are important in preparing graduates for success in the job market.

"It appears, from a number of indicators, that our graduates are being effectively integrated into a total hearing environment," Parker stresses. "They are upwardly mobile and they are involved in social and community activities."

OFFICE FOR INTEGRATIVE RESEARCH

"Each year, a variety of problems emerge at NTID which are supra-departmental," says Dr. Ross Stuckless, director of the Office for Integrative Research. "This office has responsibility for those problems which have implications for all of NTID or for institutions in other parts of the country."

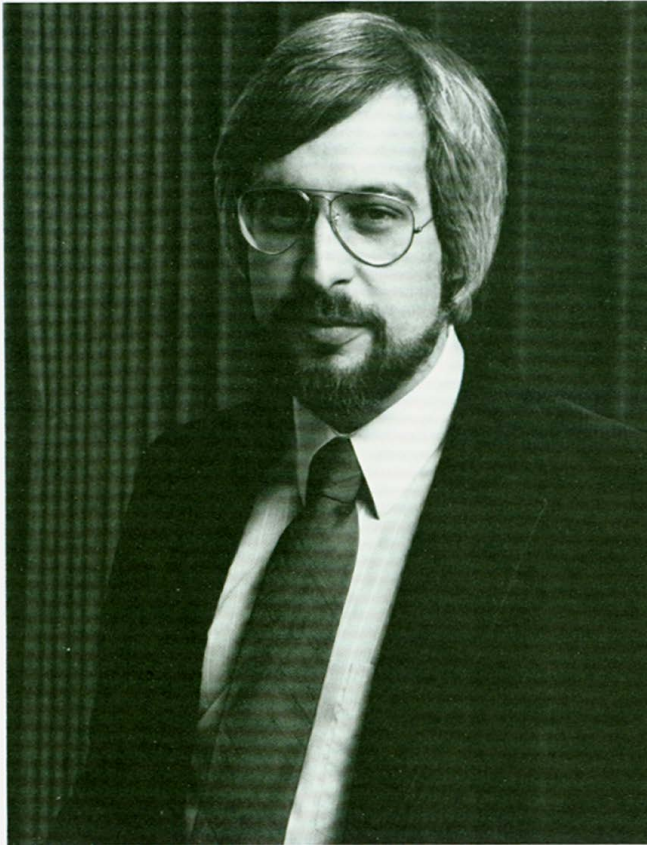
One example of such research is a series of studies conducted to determine the likely effects of the 1963-65 rubella epidemic on post-secondary education and rehabilitation services. Dr. Stuckless worked with physicians, educators of the deaf, and rehabilitation specialists throughout the United States to plan a conference on the subject. Experts met in September 1980 to share their research about rubella victims now approaching college age who will soon swell the ranks of special institutions, particularly those responsible for educating deaf students.

Dr. Stuckless also is responsible for keeping track of all research conducted throughout the Institute and interpreting it for interested people. Each year he compiles all the research papers and adds them to the bibliography he has maintained since NTID's establishment at RIT in 1967.

His office continues to be tied to outreach activities, interacting with other organizations and researchers outside the Institute in terms of research promotion and other areas that have a broad impact on NTID.

Research is handled differently at NTID from the way it is handled at most colleges and universities. In most postsecondary settings, faculty members prepare a research proposal, apply for a grant and, if it is funded, work on the project over the funding period—usually no more than one year. The opportunity to implement their research is often slim. NTID researchers, on the other hand, have the opportunity and satisfaction of following through and seeing the end product of their work, through improved techniques and materials for teaching deaf students.

—Lynne Williams

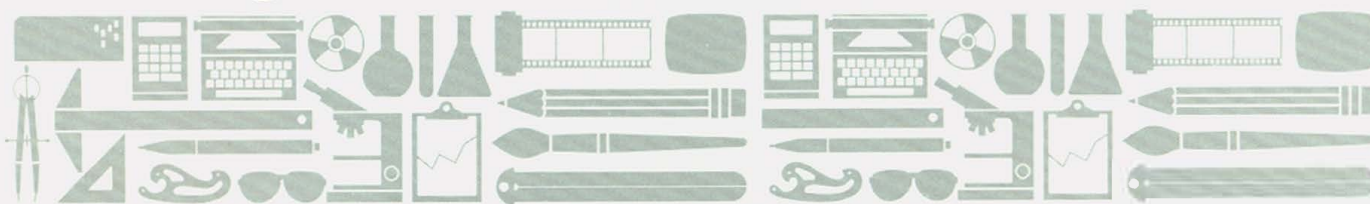


Dr. Gary Long



Dr. Ross Stuckless

Keepers of the Flame



If we see knowledge as light, then deaf students at RIT are indeed keepers of the flame, for it is they who ensure that ongoing research in deafness is a reality. These students have a special mission to fulfill. Postsecondary technical education of the deaf is a relatively new field, particularly in the technical areas that are the Institute's specialty. Students benefit from the research that was done by those who went before them, and with their assistance, RIT's academic program for deaf students will continue to improve.

"Virtually all our research depends in one way or another on the participation of students or alumni," says Dr. Ross Stuckless, director of the Office for Integrative Research. "Some research can be conducted by drawing on existing information, such as a student's audiogram or program major. Other information can be collected while a student progresses through a course, usually for the purposes of course evaluation and refinement."

But most research depends on the active, voluntary involvement of students and alumni. They are the researcher's most important asset, and this asset must be protected, conserved, and used wisely.

Each fall, new students are given an orientation which highlights the importance of research both to them personally and to students who will follow them at NTID and in other postsecondary programs for the deaf. Different types of research activities are described and illustrated with examples of changes which have been instituted as a result of NTID's research. Their rights as participants are also discussed.

Soon after NTID opened at RIT, the Institute began to receive inquiries from external researchers who wished to use NTID students as research subjects.



One question NTID researchers might ask is: Do NTID students know more about science if they graduated from a school for the deaf, or from a hearing high school?

The Cooperative Research Review Committee was formed to screen those requests and to recommend appropriate action. This committee includes the NTID Student Congress president as a student representative. More than 50 research requests have since been reviewed, and about one-half approved, sometimes with modifications. If a project is approved, a faculty member is assigned to assist the outside researcher, and to make certain that the rights of the students are protected.

Each research project which involves RIT's deaf students must also be approved by the Committee for the Protection of Human Subjects. Its primary responsibility is to examine requests for the possibility of risk to students, and—once again—to guarantee protection of their rights.

The committee also ensures that students are volunteering freely for projects, that they are not asked to participate in any project that might prove embarrassing or uncomfortable to them (at least not without a full description of any such conditions), and that valuable instructional time is not used for trying out as yet untested instructional methods.

All of NTID's research is directed toward deafness, and most of it involves NTID students. Even projects that will have implications elsewhere, such as mainstreaming and pre-college testing, usually are piloted first among NTID students.

Dr. Robert Whitehead, chairperson of Communication Research, explains that the large number of deaf students at RIT makes it an invaluable research environment, because

students can be divided into specific groups, based on educational backgrounds, communication abilities, and other characteristics. This makes research data more meaningful and applicable. "We try," he says, "to make the students generally aware of how the research we are conducting with their help is being applied. We also use deaf students as monitors for many labs and experiments."

Time is a precious commodity for students. Most research outside the classroom requires only an hour or two of the student's time, and they are paid a small fee for their participation. This payment doesn't make them rich, but it at least recognizes that their time has value.

Alumni also have a vital role in NTID's research. Dr. Stuckless says, "The real indication of the value of an education is not in the grades received or graduation with a diploma or a degree, but how this education has helped and where it has fallen short. RIT depends on its deaf alumni to provide these answers, largely through questionnaires. Not only do we *like* to know how our alumni are doing; we *need* to know."

Occasionally, students become researchers. Several courses require students to conduct a small research project that may include interviews or questionnaires given to other students. NTID researchers often act as advisors to such student projects.

One of the research areas which depends heavily on student participation is Educational Research and Development, chaired by Dr. Gary Long.

Dr. Long explains, "RIT has been given a mandate by the federal government to conduct *applied* research at NTID that focuses on the educational, psychosocial, and communication needs of hearing-impaired students. In almost all cases, this means we need real people to answer our questionnaires, to try out new educational materials and techniques, to participate in our interviews, and to take our tests.

"At NTID, these 'real' people are our students. The vast majority of them realize how important their participation is in the research effort, and for the most part they are willing to cooperate and volunteer for a variety of different projects."

—Emily Leamon



These are scenes from a filmstrip on research shown to all entering NTID students. The filmstrip was compiled by Dr. Ross Stuckless in an effort to show students how valuable their contributions are to the education of deaf students everywhere.

The eyes Have It

Imagine how you would feel if you couldn't read this page clearly... or see a road sign... or distinguish between colors. Now imagine how a deaf person with a vision problem feels when confronted with these same tasks. Having already adjusted to a hearing loss, the addition of a visual impairment can be a difficult burden, especially for a deaf college student. As Dr. McCay Vernon, editor of **American Annals of the Deaf**, says:

It is tragic irony that the sense of vision has been almost totally ignored by professionals and lay people in deafness. Obviously, sight is a thousand times more important to those who are deaf than to any other group of people. Despite this fact... few educational or rehabilitational facilities and few physicians give adequate attention to visual screening of those with hearing impairments.

Today, faculty and staff researchers for the National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT) are among the pioneers nationwide focusing much-needed attention on the visual problems of the deaf. Some projects are now in the formative stages; others are nearing completion; and still others have been finished and documented for use internally by other researchers.

Ten years ago, for example, Dr. Richard Zakia, then professor of photographic science at RIT, conducted an experiment called "Finger-spelling and Speechreading as Visual Sequential Processes" for his doctoral dissertation at the University of Rochester. The study addressed itself to questions concerning "the relative ability of deaf and hearing students to visually process words when they are presented letter by letter in a fixed position."

Previous research studies about visual sequential processing had concluded that when words are presented letter by letter (tachistoscopically) in temporal sequence, they require "substantially more time to process than when the letters of the words are presented simultaneously."

Dr. Zakia, however, questioned whether this task's difficulty might be due to "lack of experience in processing visual information sequentially," a method favored by many deaf students.

Thirty-three deaf and 19 hearing RIT students were selected for Dr. Zakia's study. Prior research had indicated that hearing subjects would have better recall of "non-words" (letter combinations which don't spell words) than of words for which letters were presented in temporal

sequence. Dr. Zakia, meanwhile, hypothesized that his deaf subjects would do better on words than non-words.

His reasoning—many deaf people have "learned" to put words together, and would, therefore, find it easier to process such letters presented in a fixed position than their hearing counterparts. Conversely, hearing subjects recalled non-words better because "it required less of an effort to remember."

Two-, four-, six-, and eight-letter words and non-words were flashed on a screen, and Dr. Zakia's hypothesis was confirmed. The deaf students had considerably better recall on words than their hearing peers. All of the subjects tended to rehearse the letters they were receiving, but the deaf also rehearsed with their fingers—"a fascinating statement on adaptation, both physical and mental," according to Dr. Zakia.

The concept of adaptation is a familiar one for researchers, and is being addressed in another research project at RIT. "The Effects of Task Demands on Effective Visual Field in Deaf Subjects" is being conducted by Dr. Ila Parasnis, communication research associate and assistant professor.

Dr. Parasnis' study is based on the notion that deaf people may develop different attentional strategies than hearing people for processing information from the visual field.

"We all have limited capacity to pay attention to visual information," Dr. Parasnis says. "We generally attend to information from the central part of the field more than from the periphery."

"Foveal (central) vision is used to analyze information, while peripheral vision helps one decide what information needs processing," Dr. Parasnis continues. "Research has shown that as task demands on the fovea increase, the ability to process peripheral information decreases and hence, the effective visual field constricts in its boundaries."

Since deaf people generally have less auditory information than hearing people do to alert and orient them to new stimuli, they may depend more on information from their visual periphery. Consequently, deaf people may not show the same constriction patterns.

"Perhaps," Dr. Parasnis reasons, "this dependence may result in a larger peripheral field being available to deaf people." This is a relatively new area for research, but it is very important. Her study will test the informal observations of many persons that deaf people seem to notice things farther out in the periphery than do hearing people.

Dr. Parasnis and Dr. Vincent Samar, a fellow research associate and assistant professor, are collaborating on another project which will test the relationship between eye movements and reading in deaf students. This project will test the hypothesis that auditory impairment may make deaf people develop different attentional strategies which will be reflected in the way they read.

"We know that cognitive knowledge controls eye movements to a large extent," Dr. Parasnis says. When we read, we voluntarily move our eyes to bring new information into view. These eye movements are called saccades. Good readers have long saccades, allowing them to take in more information within a single glance when the eyes pause over the text.

"They also have fewer regressive eye movements, and can utilize prior knowledge of the material's context to process what they read and to decide where to move their eyes."

Since many deaf people have difficulty with English language skills, they may use different reading strategies, resulting in eye movement patterns different from those of hearing people.

Drs. Parasnis and Samar will study deaf students' eye movement patterns as they read by monitoring their saccadic eye movements. Their results should be helpful in determining how to improve the reading skills of deaf students.

Improving the reading skills of entering deaf RIT students was one reason the NTID Vision Task Force was created in 1976. The group came together after several instructors had expressed concern over students with visual problems in their classes.

Until then, educators, like their research counterparts, had not really looked into students' visual problems. Dr. Donald Johnson, chairperson of the Task Force and professor in the Division of Communication Programs, says, "Too many people do not seem to realize that, without their hearing, deaf students depend more heavily on their vision. And many deaf students, just as their hearing counterparts, have vision problems."



Communication Research Associate Dr. Frank Caccamise, center, and Dr. Malin Howard, consulting ophthalmologist, discuss the results of an ophthalmological examination with a deaf RIT student.

Fifty-eight percent of the approximately 300 deaf students who enter RIT each year have some functional vision problems, such as acuity or color deficiency. Of that number, perhaps 70 need special help, whether it's consulting an ophthalmologist for a visual examination, correcting a prescription, or receiving information about visual hygiene.

Before the Task Force was created, entering deaf RIT students were not required to have any sort of visual checkup. Today, a visual screening program has been incorporated into the Summer Vestibule Program (SVP) for incoming students, and on-campus ophthalmological exams are provided for those students who do not pass the screening.

Last year, slightly more than 50 percent of the referred students went for the examination, a figure Dr. Johnson would like to improve by making the ophthalmological exam part of SVP.

"The main activity of SVP is career sampling," Dr. Johnson says. "It makes sense, therefore, to test students at this time, so that all visual problems can be attended to before the school year begins."

"For example, what if a student has a visual acuity problem that is not correctable and doesn't know it? That student might enter a major where this could have a significant impact, such as photography. It would be better to find out early, in order to assist the student in career planning as well as to make appropriate instructional and environmental modifications."

Dr. Johnson and Dr. Frank Caccamise, communication research associate and associate professor at NTID, have suggested that a staff vision specialist could serve a valuable role in meeting the visual needs of deaf RIT students, both with and without visual problems.

Both stress that their main concern is cooperation, an idea which permeates all research.

"Many of the instructional techniques and materials used at RIT depend on the use of vision," Dr. Caccamise says. "Therefore, optimizing opportunities for all students to use their vision will enhance the academic and career opportunities for these students."

—Kathleen Sullivan

In Search Of...

DEAF CELEBRITIES

The National Technical Institute for the Deaf (NTID) is fortunate to count among its numbers two outstanding deaf educators—Professor Emeritus Loy Golladay and Professor Robert Panara. Both have been with the Institute since its early days, and Professor Panara served on the original National Advisory Board which chose Rochester Institute of Technology (RIT) as NTID's host institution.

For many years, both men have researched the accomplishments of deaf people in history, and they are using their research to provide role models for young deaf people who come to study at the Institute.

"My fascination with history began when I was a boy hunting for Civil War artifacts and Indian arrowheads on our Virginia farm," Golladay says.

That was only the beginning. He spent the next 45 years teaching, and almost half of those years editing *The American Era*, a newspaper for the American School for the Deaf, the first permanent school for the deaf in this country. He says that experience was "excellent preparation for researching, writing, and videotaping America's deaf heritage." He has since written dozens of stories about deaf people and their early history.

"I am particularly pleased to have initiated, in 1975, a reappraisal of the life and work of Laurent Clerc, America's first deaf teacher," Golladay says. In October 1980, he was one of five deaf Americans selected to dedicate a memorial plaque in Clerc's honor at his birthplace of La Balme, France.

Golladay's research into deaf history has garnered "hundreds of stories which fill two file drawers." These stories are used in talks to deaf high school students, deaf RIT students, and interpreter trainees.

They are the subject of several videotapes, including "Off Hand Tales," a collection of "about 25 anecdotes, a short spooky story with a deaf character, and a tall tale or two about deafness." This tape is now in its second edition. "The first was worn out from excessive use," says Golladay. These videotapes will soon be available nationally through NTID's Outreach Program.

An example of the type of story he relates in the tapes is the whimsical theory of how Texas won its

independence at the Battle of San Jacinto.

General Sam Houston's friend and chief scout was Erastus "Deaf" Smith, who was very hard of hearing. The Texas army crossed the San Jacinto River on a small bridge, then confronted a much larger Mexican army under General and President Santa Anna.

At that point, Houston ordered Smith back to destroy the bridge. No doubt Houston had to shout the order so loudly that every Texan



Loy Golladay

knew there was no retreat. Fired with this knowledge, the Texans won the battle and their independence.

"I am planning more historical and biographical tapes about the deaf in cooperation with NTID's Instructional Television Department and Dr. Patrick Smith, an instructional developer," Golladay says. "These should fit in well with the Deaf Studies course I plan to teach this fall."



Robert Panara

Professor Panara spent many years researching deaf people successful in the theatrical and literary arts, as well as deaf characters in fiction and drama. His interest intensified during his doctoral studies when he chose "Deaf Characters in Fiction and Drama" for his thesis. However, research on the subject was so sketchy that no faculty member at his university was knowledgeable enough to act as an advisor for his work. He enlisted the aid of the chairman of the English Department, who agreed to read the published works involved; but Panara's hopes were dashed when the man suddenly died six months later. It was a year and a half before he was able to secure other help, but before he could move ahead with his research, he accepted a job at the newly established NTID.

Although his doctoral thesis was abandoned, Panara's interest in deaf characters in literature was not. In 1973, he initiated the course, "Deaf Studies in Literature" as an elective in RIT's College of General Studies. As instructor of this popular course, he continues to search for new evidence which he passes along to his deaf and hearing students.

His interest does not end with fictional characters, but extends to the very real accomplishments of deaf people, from today and the past. One research area he pursued was achievements of deaf writers in America during the past 160 years. He says the significance of those achievements "can best be appreciated when we consider that, until 160 years ago, the deaf in America hardly even knew how to read, much less write a simple sentence unaided."

The earliest example of an American deaf writer's work he found was "The Legend of the Rock and Other Pieces," a volume of poems written by James Nack in 1822. Nack, who became deaf at age nine, was hailed in one literary review as "an intellectual wonder" who showed more promise as a teenage poet than Byron.

Panara was also intrigued by John Carlin, an outstanding portrait painter and widely published poet of the mid-1800s. Carlin's success was especially unusual, Panara says, "because he was born deaf and had never heard the natural rhythms of the spoken language, the song of the skylark, or the lilting music of the hurdy-gurdy. He was the first and only deaf-mute poet the world has ever known."

Another discovery was poet and journalist Laura Redden, who wrote under the pseudonym "Howard Glyndon." She was a remarkably liberated young woman who wrote poetry and served as a correspondent for *The Republican*, a St. Louis newspaper, from 1860 to 1880.

"Obviously, she must have possessed a great spirit, as well as a keen eye for detail," Panara says, "since it is well known that very few hearing women were covering the newsbeat in those days."

These are but a few of the many success stories Panara unearthed from the past, and his interest continues into the present as he follows the accomplishments of deaf people in the cultural arts. In his paper, "Cultural Arts Among The Deaf," Panara documents the efforts of the National Theatre of the Deaf (NTD) and the Little Theatre of the Deaf (LTD) to enhance deaf awareness.



John Carlin



Laura Redden

MORE CELEBRITIES



His article also highlights the successes of Bernard Bragg, whom he says is justly called "the prince of players on the silent stage." Bragg studied mime with Marcel Marceau in Paris and toured the United States with a one-man show. He made numerous television appearances, and had his own weekly show in the early 1960s called "The Quiet Man." He helped establish NTD and has, according to Panara, "been one of its brightest stars for more than 10 years."

Linda Bove is another performer who has succeeded in the difficult and competitive field of theatre arts. A past member of NTD, Bove has the distinction of being the first deaf person to appear in the daytime TV show, "Search For Tomorrow," and is a permanent member of the popular children's show, "Sesame Street." Panara points out that by communicating with "hands that talk," she is helping develop deaf awareness, particularly among a younger generation.

Other outstanding deaf achievers include TV producers Jane Wilk and Peter Wechsberg, who started the first TV program with deaf newscasters in San Francisco. Wilk and Wechsberg, who used sign language and fingerspelling to communicate world news to their deaf audience, won an Emmy Award for their show. Wechsberg won another Emmy for his documentary film, "My Eyes Are My Ears," an NBC-TV special which featured success stories of deaf people who had contributed to the cultural, educational, and social growth of California.

Others successful in the performing arts are: Bruce Hlibok as a deaf teenage rebel in the Broadway musical, "Runaways"; Jeffrey Bravin in the CBS-TV special, "My Name Is Jonah"; Kitty O'Neill, "Hollywood's most amazing stunt woman"; and Juliana Field, actress in both "Captain Kangaroo" and the film, "Golden Girl."

Probably the best known of the group is Lou Ferrigno, who is featured in CBS-TV's "The Incredible Hulk."

Ferrigno, who is chairman of this year's Better Hearing and Speech Month, appeared on a poster and in a public service announcement produced by NTID's Public Information Office and Media Production Department. Both will be distributed nationally to create awareness about hearing and speech disorders, and to encourage the more than 22 million Americans with these problems to seek help.

Panara also has documented the efforts of deaf artist Cadwallader

Washburn, whose works grace museums worldwide; sculptor Douglas Tilden, whose statues are found in Golden Gate Park and other San Francisco locations; and architect Thomas Marr, who designed the largest hotel of his era (early 1900s) in Nashville, Tennessee.

Panara is putting the findings from his research to work at RIT, furnishing valuable role models for deaf students.

"It is important to note that the deaf person who identifies with a deaf counterpart on stage or on television gets a psychological boost which helps remove the stigma of deafness," he stresses. "He or she

discovers a new self-image and comes away with greater confidence and a more positive attitude toward life and society."

He adds that the list of role models is long, and growing all the time.

"Note, for instance, the outstanding accomplishments of Phyllis Frelich, who won the 1980 Tony Award for Best Actress in the Broadway hit, *Children of A Lesser God*."

Panara looks to the day when a complete history of these cultural achievements of the deaf is written—preferably by a deaf writer.

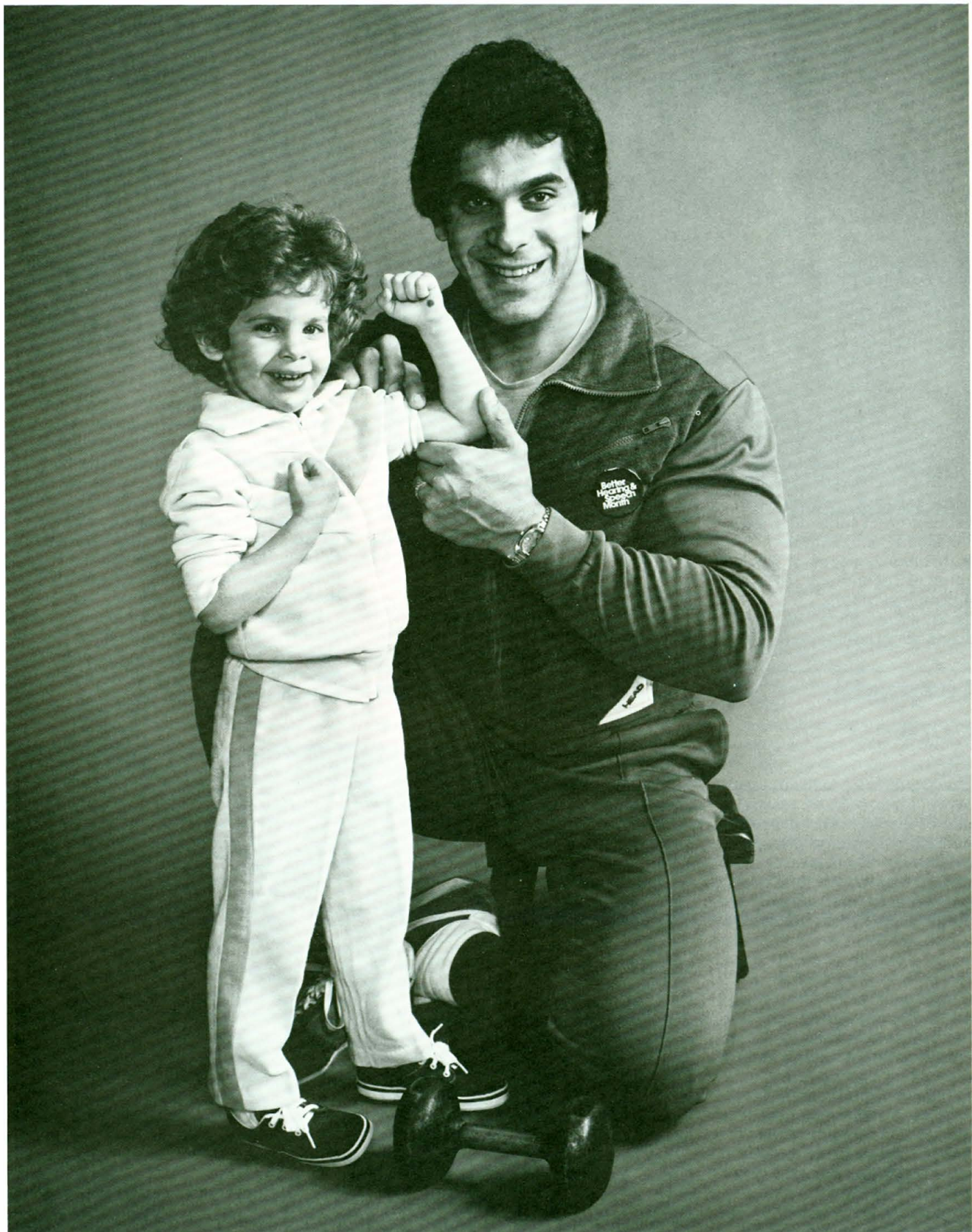
—Lynne Williams



Bernard Bragg



Linda Bove (seated on steps) visits with children and Big Bird on Sesame Street.



Lou Ferrigno and Better Hearing and Speech Month poster child Sarah Halpert.

TWO ^{or more} HEADS Are Better Than One

Research is rarely accomplished in isolation at the National Technical Institute for the Deaf (NTID). Many projects are cooperative efforts. Researchers often collaborate with each other, with other NTID faculty, and with researchers in other colleges of Rochester Institute of Technology (RIT), as well as outside institutions.

The following are only a few of the many projects being conducted at RIT.

The Linguistic Structure of ASL

The study of the linguistic structure of American Sign Language (ASL) being conducted by Dr. Susan Fischer, research associate for Communication Research, and Joan Forman, English specialist in Communication Instruction Department I, is an excellent example of close cooperation between researchers and teaching faculty at NTID.

For years, many people thought ASL had no particular structure. Fischer and Forman are among many researchers finding that not only does grammatical structure exist in ASL, but it is consistent in signers from all parts of the country. Their latest investigation has been looking at how cause and effect are expressed in ASL.

Critics argue that many deaf people have problems with the concept of causation. Some blame these difficulties in part on the alleged limitations of ASL.

"We conducted an experiment in which we showed pictures to deaf student volunteers and asked them to describe what was taking place," Dr. Fischer explains. "We found that they could easily understand and express cause and effect and its various nuances. If deaf people have a problem with the concept, and I frankly doubt that they do, it is probably not because of ASL."

Forman adds, "There are very complicated ways of expressing cause and effect in ASL which involve a complex interaction of sign choice, facial expression, body position, and eye gaze."

Collection and analysis of the data used in these studies involves close cooperation with student consultants who are native ASL users. "The consultants can reliably recognize the different grammatical structures," Forman stresses. "Using videotapes, we can actually train our consultants to be linguists, and we are finding that they are becoming as good as we are—sometimes better!"

Forman adds that watching ASL videotapes is a good experience for students who have grown up with ASL, but who may not fully appreciate its complexities.



Researchers Dr. Susan Fischer and Joan Forman (standing l. to r.) work with student consultants Frank Todesco and Keith Cagle in their study of American Sign Language structure.

"Now they have the opportunity to see that ASL is as grammatical and as interesting as English," she says. "As an English teacher, I give my students rules every day. Now I can show them the parallels between the two languages, which, in turn, helps them with their English."

Another important benefit of these studies, according to Dr. Fischer, is that "it can help interpreters and interpreter trainers. We are finding that there are a lot of subtleties which interpreters can learn and easily incorporate into their signing so that more information can be imparted to their deaf audience."

An example of collaboration with an outside institution is Fischer's work with Dr. Rachel Mayberry of Northwestern University. They are videotaping signers with varying abilities, from native signers to those who have only recently learned to sign, in a task involving remembering ASL sentences. They are looking for reliable indicators of ASL fluency. Fischer and Mayberry have found that when their trained consultants watch the videotapes, they are able to easily identify the signer's skill level, and can also tell whether or not the signer used ASL as a native language.

Speech Research

Approaching language from another vantage point is the team of Dr. Dale Metz, assistant professor and research associate in Communication Research, and Brenda Whitehead, assistant professor and speech pathologist for Communication Instruction II. Their project is part of a large scale research effort designed to identify the physiological characteristics which contribute to abnormal speech patterns in the deaf.

Deaf individuals frequently have abnormal voice quality—harsh or raspy—and they don't use the larynx appropriately in terms of making linguistic distinctions. For example, it is the vocal fold vibrations which create the sound differences in the letters "B" and "P".

"In this study, we are filming the vocal fold vibrations," Dr. Metz explains. "The larynx is of particular interest because it serves as the primary source of acoustic energy, modulates or controls the air stream coming through the vocal tract, and serves a linguistic function in terms of distinguishing between certain sounds."



Dr. Dale Metz (standing) and Brenda Whitehead (seated) work with student consultant Murl Thadani as part of their speech research.

"We're interested in the physiological nature of abnormal voice quality and how deaf individuals use the larynx in terms of making these linguistic distinctions between sounds," says Dr. Metz.

"We know they make errors," Whitehead adds, "but we don't know exactly how they are making them. We're focusing now on determining the contributions of the larynx."

In addition, Metz and Whitehead are studying other aspects of voice production, such as breathing patterns and certain types of articulatory patterns. In this effort, they are working cooperatively with several researchers outside RIT, including Columbia University researchers Dr. Ron Baken and Steve Cavallo.

"We are looking at breathing in conjunction with how the larynx is working," says Dr. Metz. "We're working with Dr. James Mahshie at Marquette University, who is studying selected aspects of laryngeal functioning of deaf speech; and with Dr. Nancy McGarr of Haskins Laboratories in New Haven, Connecticut."

Metz, Whitehead, and some of these researchers have pooled their data and written a book chapter entitled, "The Physiological Correlates of Deaf Speech."

"We are all basically interested in the same thing," says Whitehead. "We want to find out what physically contributes to abnormal speech so we can help the deaf overcome their speech problems."

Dr. Metz points out that this task is not as easy as it might seem because of the complexity of the physiology of speech. It requires hundreds of muscle groups that behave differently in different circumstances.

In order to determine which variables are more critical, the team is actually "going into" the throats of deaf individuals. There they film the larynx as it opens and closes, which occurs at a very rapid rate. During production of a vowel sound, such as "ah," the vocal folds may open and close 175 times per second or once every eight one-thousandths of a second, so filming must be done at approximately 4,000 frames per second.

Dr. Metz says it was not easy to find students willing to become involved in this project. "Not everyone is terribly interested in having mirrors placed in their throats, even though they are paid to do it. In research, cooperation of the subject is critical, and we depend on volunteers."

The researchers did find five students willing to be filmed and, according to Dr. Metz, the Institute now has the only films of this kind in existence.

Whitehead became interested in this project since, as a speech pathologist, she works directly with students. She now is trying to apply what has been discovered. "We try to utilize our research instruments like the electroglottograph to give

the student feedback about changing certain aspects of the voice," Whitehead says.

Another instrument offering this important feedback is the Speech Spectrographic Display (SSD), a device which has been used on a selective basis at RIT for the past four years.

Dr. Robert Whitehead, chairperson of Communication Research and associate professor, explains that it is particularly beneficial for students with little functional hearing.

"The SSD is one of several visual feedback devices available on the market and is used as an adjunct to speech therapy to assist students in improving and monitoring speech production," he says.

The instrument consists of a microphone, amplifier, central processing unit, and a readout device similar to a television screen. When a student produces an individual phoneme, or speaks a word or phrase into the microphone, a two-second acoustic representation appears on the screen. This "spectrum" is a plot of the acoustic frequencies of the speech sample and their intensity over time. Students then can compare and monitor their production against programmed drill materials or samples provided by the speech therapist, and concentrate on improving articulation skills.

"We have linguists who are concerned with what is happening in the brain and we're concerned with the physical response," Dr. Metz concludes. "We need both kinds of research."

National Project On Career Education

In addition to its responsibility for research within the Institute, NTID also works cooperatively with other institutions to help solve problems faced by deaf people across the country. The National Project on Career Education (NPCE), sponsored jointly by NTID at RIT and the Pre-College Program (Kendall Demonstration Elementary Schools and Model Secondary School for the Deaf) at Gallaudet College, is an example of this close cooperation.

Coordinated by Judy Egelston-Dodd, associate professor at RIT for NTID, the project was initiated in 1978 to help meet the need for inservice training in career education

(CE) for the hearing impaired. The project was co-directed by Dr. David Updegraff, director of Public Law 94-142, Office of the Pre-College Program at Gallaudet College.

In 1978, two national working conferences, sponsored by NTID and Gallaudet, drew CE experts from throughout the country.

"We wanted to find out what they had tried that worked in CE, what had not worked, and why," Dr. Egelston-Dodd explains. "We ended up with two top needs: inservice training for staff, and a comprehensive CE plan for educators working with primary, elementary, and secondary level students."

During the three-year project, the two institutions divided the country into eight regions and sponsored workshops for each.

"Each state is represented by a team and each team has four people—a counselor, an administrator, an elementary school teacher, and a secondary school teacher," Dr. Egelston-Dodd explains. "Team members come, learn strategies and techniques, and then return to their home schools to give inservice training."

Sixty schools have been involved in the project. A team leader in each school acts as the liaison with the coordinator and documents the school's plans for a career program, implements it, and reports to the coordinator each time a milestone is reached.

As project headquarters, NTID serves as the linking agent for all the schools. Plans and reports are summarized by Dr. Egelston-Dodd and disseminated in a project newsletter to schools in the network.

"Lack of communication was a problem we faced before the project," Dr. Egelston-Dodd explains. "Many people were doing productive things, but each had their own isolated effort and nobody knew about the others."

She has traveled extensively to coordinate the project. Replication workshops have been held in Arizona, California, and Tennessee. One held in Southeast Los Angeles County included teams of educators who are dealing with other disabilities, because much of what has been learned about career development of the deaf can be applied to other disabled students.

Dr. Egelston-Dodd says she would like to relax now and tell the local schools which still need inservice training in career education: "There are experts in your region who have been trained, use them. They will cost you less, be more efficient, and

have a better understanding of your school needs because they are closer to them."

In the future, she hopes more CE training will take place as part of teacher training rather than taking time out of a busy schedule for inservice training later.

Alumni Follow-Up Study

In research, as in many other areas, NTID works closely with its host institution, RIT. This is particularly important with a project such as the alumni follow-up study being conducted by Nancy Neville, acting director of RIT's new Career Research Department.

"We're gathering information about our alumni to help with program planning and career advisement," says Neville. "We work closely with NTID to assess industry's needs because of the vast amount of career development research already done there for deaf students. By working together, we can coordinate research throughout the campus."

Approximately 10,000 alumni who graduated one, three, five, and ten years ago will be surveyed yearly. RIT plans to use the information it gathers to assess how well it has educated and assisted students in the areas of career preparation, on-campus services, and general skills needed for successful living.

"We are planning a Career Study Fellows Program with case studies on 20 to 30 graduates each year," Neville says. "Studying their career decisions should help us turn out more marketable students."

"We also want to come up with a compatible data base," Neville stresses, "so we can do comparative studies of deaf and hearing RIT students. There is a lot of useful research we can do together."

RIT Research Corporation

Garbage used for fuel, development of fusion energy, new hearing aids for deaf people—all are exciting new areas being explored by the recently formed, profit-making RIT Research Corporation, created to provide technological advancements for business, industry, educational institutions, and government. The Corporation has three divisions: Energy, Graphic Arts, and Communications.

"The Energy Division was established in March 1980," says Cyril Noon, the Corporation's first president. "Headed by Dr. Robert Desmond, P.E., the division has been looking into several areas of study. The most exciting is the co-generation of heat and electricity by using renewable fuels such as garbage."

According to Noon, RIT is looking into the possibility of wood and brush as a resource. To do this, RIT would buy or lease a plot of ground, possibly 10,000 acres, depending upon energy needs. "We'd start at one end, using the growth and replenishing it as we go along, so that by the time we reached the other end, the first part would have grown back."

Another renewable resource, available in abundance, is horse manure. "We are studying the possibility of burning manure to generate heat and it looks very promising," Noon says. "As a matter of fact, one of our people recently went to Arkansas to test burn about 10 tons of manure."

If the idea proves workable, Noon stresses there will be no problem getting plenty of this material. "We've already been in touch with quite a few racetracks."

Researchers have been working with the University of Rochester's Laboratory for Laser Energetics in their search for ways to develop fusion energy, using hydrogen isotopes.

"If you put deuterium and tritium together and add enough heat and pressure, they will fuse, and generate a lot more heat," Noon says. "This process is very clean, leaves no residue, and has very low radiation levels."

The Corporation's Graphics Division, still in its formative stages, will carry on research activities in the areas of printing processes, waste management, and press run color measurement. The investigation of heat losses from printing plants could be tied in with the Energy Division. Dr. Lothar Engelmann, dean of the College of Graphic Arts and Photography, will become director of the Graphics Division July 1, 1981.

Finally, NTID is most closely associated with the Corporation's Communications Division. Dr. Kathleen Crandall, associate dean and director of NTID's Communication Division, serves as a director of the Corporation.

"An inventor in Arizona recently proposed a new type of hearing aid," Noon says. "Following review of the proposal by Dr. Crandall, the inventor visited RIT and met with researchers at NTID and members of the electrical engineering department."

Although the inventor's proposal was ultimately rejected, it exemplifies the kind of cooperative efforts that might occur beyond RIT.

The Research Corporation has chosen three areas where RIT has significant strengths and, once those three are functioning fully, more may be added, including ones that draw on other strengths of NTID.

Alcohol Abuse Among the Deaf

Another area of study largely ignored by researchers was potential alcohol abuse among deaf people. Dr. Morton Isaacs, associate professor in RIT's Social Science Department, became interested in the subject while teaching a class on alcohol abuse four years ago.

"I decided to take a sabbatical to work on the study, and began a search for literature on the subject," Dr. Isaacs explains. "I was surprised to discover that there was virtually none. The same lack of research existed regarding abuse among other disabled populations."

Dr. Isaacs teamed up with deaf RIT students Jerry Buckley and Donna Martin, who were working on their senior thesis in social work; and the three went into the Rochester community to try and locate deaf people willing to become involved in the study.

"We had a difficult time locating people," Dr. Isaacs admits. "From among 600 deaf adults in the community, we randomly chose 120 names and ended up with 39 who participated."

The researchers had three possible hypotheses: 1) that having special problems, deaf people would have more pressures and, therefore, drink more; 2) that living in the same society with the same problems and stresses, deaf people would drink to the same extent; and 3) that having lived with their disability their whole lives, deaf people may have developed special coping strategies and, therefore, would drink less.

The results proved interesting. A comparison of their data with a study done on alcohol abuse among hearing people in Buffalo disclosed virtually no difference between the deaf and hearing populations, either in how often they drank or the amount consumed.

"When we contacted drug abuse agencies early in our study and asked about deaf alcoholics, we were asked, 'What deaf alcoholics?' Deaf people were just not seeking help from the agencies," Dr. Isaacs explains. "Theirs is a very tight community, peer pressure is very strong, and many agencies don't employ people who understand sign language."

As a result of the study, RIT received a substantial grant from the state government to set up an agency to deal with this problem. The Substance Abuse Interventive Services for the Deaf (SAISD) has offices at RIT's City Center.

This year, Dr. Isaacs began work on a new project involving alcoholism and measurement of pupil dilation.

"The pupil is a known indicator of arousal," he states. "I'm studying an application of this principle to attempt to detect people who may be susceptible to alcohol abuse, and then to test whether or not rehabilitation therapy has been successful."

In order to pursue his study, Dr. Isaacs needed a pupilometer, a very complicated and expensive piece of equipment. When touring the remodeled research facilities at NTID one day, he spotted the machine.

"I asked if I could use it. Not only was the answer, 'Yes,' but Vince Samar and Ila Parasnis of NTID have given us every assistance in its use."

—Lynne Williams

INTERN



DOCTOR

RESEARCHER

NTID's Michael Stinson

Michael Stinson remembers being "on the fringe of things" during his difficult high school years. His deafness, coupled with several family moves, left him feeling "socially backward" and not completely in tune with his hearing peers.

Today, Mike Stinson isn't on the fringes anymore—he's right in the thick of things as an assistant professor and a researcher for the National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT). Stinson also has the distinction of being one of only a handful of full-time deaf researchers nationwide.

He doesn't consider himself "special" in any way, though. "I'd rather think of myself as one of the many good researchers here at RIT," he says.

Stinson has been working in Rochester since 1978, although he is a native Californian. He was not born deaf, but started losing his hearing when he was three years old. His loss increased until he was 18, and then stabilized. During this time, however, Stinson attended only mainstreamed schools.

"My parents resisted efforts to put me in a school for the deaf when I was in the first grade," he recalls. "I had already acquired language when I lost my hearing, so mainstreaming seemed the more logical choice."

Several geographical moves during his teenage years, however, did little to help him adjust to his hearing loss.

"High school was the worst time in my life," Stinson says. "I went to four different schools in four years. The anxiety caused by moving was bad enough, but the added frustration of deafness made it really tough."

To combat his frustration, Stinson turned to athletics, playing baseball and basketball.

"Sports offered a sense of recognition that was very important to me at the time," he says. "Athletics were a way to make friends and meet people." Stinson was an all-league basketball player, although he jokes that "the players in my 'noon league' here at RIT probably won't believe that!"

Stinson attended the University of California (UC) at Santa Barbara for two years, then transferred to UC Berkeley, where he majored in psychology.

Working with an education group called "Los Amigos," he spent one summer building a school for the deaf in Tijuana, Mexico. He spent three other summers at a camp for handicapped children in Santa Cruz. Working with these children sparked a curiosity about the motivational and psychological problems of the handicapped, and Stinson returned to school with a renewed interest in psychology.

After he graduated from UC Berkeley, Stinson completed both a masters and a doctoral program at the University of Michigan. He also pursued his interest in special education through internships at the Lexington (N.Y.) School for the Deaf, the Michigan School for the Deaf, and NTID at RIT.

Stinson was the first person accepted into NTID's internship program, and has since been followed by nearly 300 other graduate, professional, and special interns.



Dr. Michael Stinson explains the computer terminology analysis of a program to Pamela Ng, graduate assistant in the Department of Educational Research.

His 1969 internship at RIT was under the guidance of Dr. Ross Stuckless, director of the Office for Integrative Research.

"I enjoyed my stay at RIT very much," Stinson says. "I worked on a project related to communication between deaf and hearing students, and the things hearing people can do to help the deaf in seminars, lectures, etc."

This internship was especially interesting for another reason.

"My internship was in July, and I was going to get married in August," he says. "Needless to say, my studies weren't always the focal point of my attention during those weeks."

The cause of that daydreaming, Susan, had just finished her baccalaureate program in sociology at the University of Michigan. The Stinsons now have one son, Gregory, 4.

From 1972-74, Stinson worked in the Bureau of Child Research at the University of Kansas Medical Center, and then spent four years at UC San Francisco's Center on Deafness.

He came to NTID, a place he "has always been interested in," three years ago, and has been involved in a variety of research projects ever since.

Stinson's chief research project concerns the NTID Tutor/Notetaker program, one of many support services offered to deaf RIT students. Stinson is evaluating students' perceptions of the program to get an idea of how it might be improved to better serve their needs.

He also is investigating deaf students' comprehension of interpreted lectures. "We're looking for ways to help students pick out the most important information during a lecture," he says, "a skill which can be improved through practice."

Of the approximately 950 students enrolled last fall, 157 were cross registered into RIT's other colleges. Stinson sees this as evidence that his research efforts are both useful and timely.

"You can be as mainstreamed as you want," he says. "The most important element is that the student has a choice. That is the key."

"In many places, mainstreaming becomes an administrative rather than an educational concept. When that happens, people forget that the idea is to help the deaf student. It's like throwing a short rope to a drowning man."

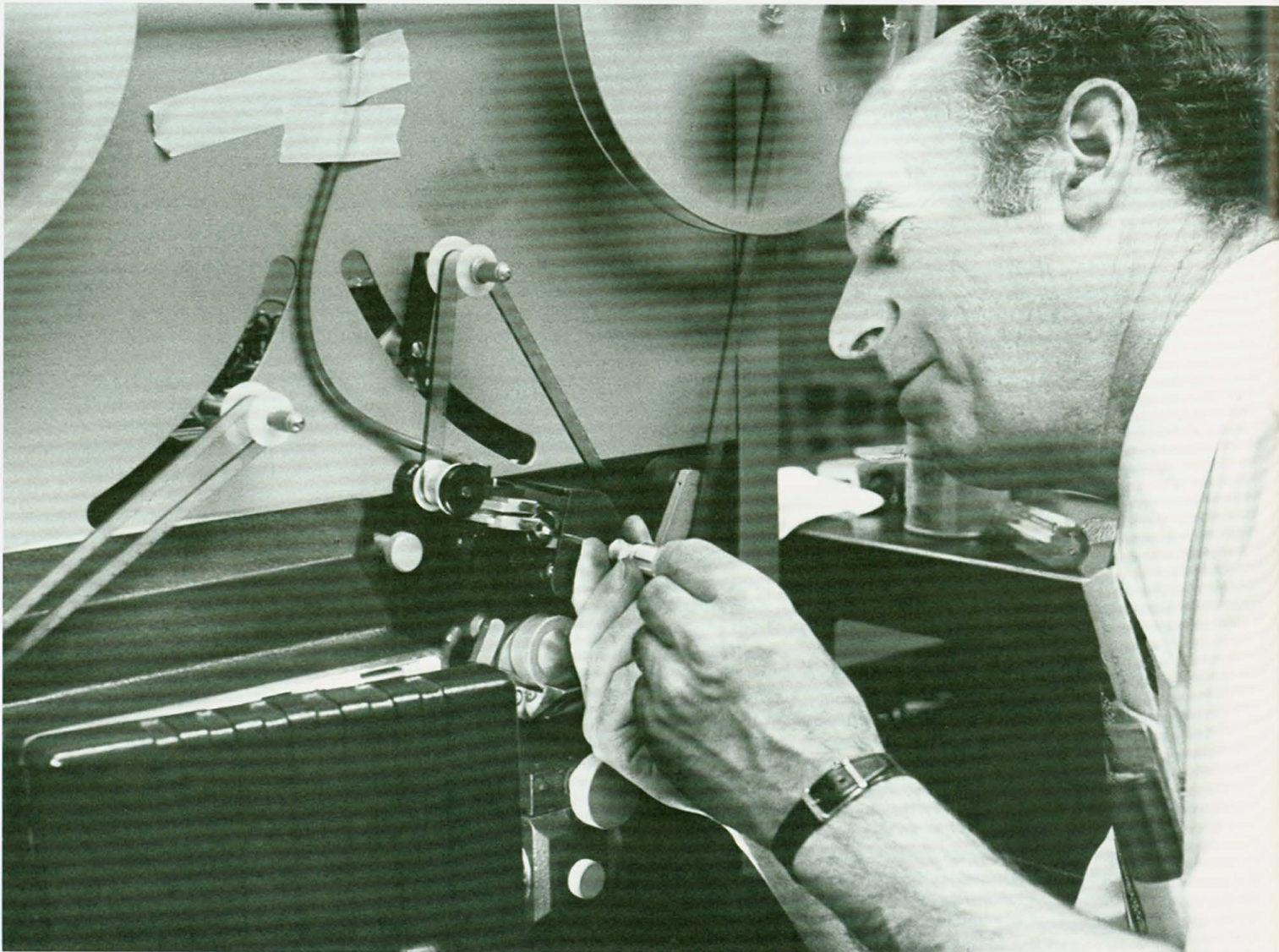
Cooperation between researchers at NTID is "one of the elements that makes working here so exciting and unique," Stinson says. He cites mutual concern for students as the common bond between researchers and teachers at the Institute.

"I try to involve teachers in research projects whenever possible," he says. "There is good communication between people here, which is very important. No one is working in isolation."

—Kathleen Sullivan

MR.

WIZARD



Robert H. Murray, RIT's "resident inventor" through NTID, adjusts the device used to read captions from 16mm motion picture film for incorpora-

tion into the television broadcast signal. PBS is testing the data read head in the Washington, D.C. operations center.

Each evening, television screens come alive across the country as families settle down to watch their favorite shows.

In recent years, an increasing number of those screens have captions to supplement the picture and sound, enabling hearing-impaired people to participate in this pastime. Unfortunately, the number of captioned shows available has been limited because the current process requires that film be transferred to videotape for captioning.

This limitation will soon end due to the efforts of Robert Murray, the resident "inventor" of NTID at RIT. For the past three years, he has been instrumental in the development of a process to encode and hide captions on motion picture film.

"Of all prime time television shows, 75 to 85 percent start out on motion picture film and at least half of all television broadcasts are aired directly from film," explains Murray, a 1950 RIT photography graduate and now applications engineer in NTID's Division of Media Development and Services.

"Movie film can be transferred to videotape for captioning," Murray says, "but producers don't like to do it because it's more expensive and results in a loss of quality."

He also points out that movie film allows local stations to splice in commercials easily, and is less expensive to ship than heavy videotape when a program goes into syndication.

Development of this process began in spring 1978 with a request by the Public Broadcasting System (PBS) supported by the Bureau of Education for the Handicapped in cooperation with the Bureau of Standards. PBS sought a feasibility study of ways in which motion picture film might be captioned.

In June 1978, NTID at RIT hosted a national conference on captioning which a number of PBS officials attended. During the conference, they approached Dr. Paul A. Miller, then president of RIT, and Dr. William E. Castle, now vice president of RIT and director of NTID, with the appeal that RIT respond to the request. Murray was placed on leave of absence to devote full-time leadership to the team responsible for preparing RIT's feasibility report.

As he began the study, Murray had to address several problems. He had to find a way to make the caption data a part of the film image without interfering with the normal use of the film, and the system had to work with both 16mm and 35mm film. The former is used to send programs and movies to the network affiliates for individual broadcasting schedules, while the latter is used for direct network broadcasts. In effect, two new standards had to be created, even though they were very similar.

During the next four months, Murray came up with 20 feasible methods. He then worked with an ad hoc group of industrial leaders who studied each of these. Eventually, the list was pared down to four of the more practical methods to present for PBS consideration.

"Using the method finally selected by PBS, we're able to put a data track right next to the film's sound track, in a spot that goes through the entire system," Murray explains. "The only segment of the industry which has to make any changes is the sound lab which produces the optical sound track masters. It will be responsible for placing the data track on the film at the same time the sound track is exposed.

"To ensure success for captioning," he continues, "we also had to solve a major problem the motion picture industry has been wrestling with for the past 10 years—identifying every frame of film. We wanted to make this system so appealing that the industry would be eager to adopt it.

"We did not have to convince the motion picture industry that this process would do for them what magnetic ink and the numbers at the bottom of checks did for the banking industry. If banks had to go back to sorting checks by hand—some 100 million a day—it would put them in a terrible bind. That's where the motion picture industry is right now. It is handling a tremendous amount of film and is still doing it by looking at small numbers printed at one-foot intervals along the edge of the film.

"Early in the study, I was told that it was possible to have only 16 bits of information per frame, but I didn't believe that," he recalls.

"Mathematically, the resolving power of the film indicated that we should be able to get much more. We're now getting 80 bits on each frame with better than 99.98 percent reliability on playback under the best conditions, and better than 98 percent under most conditions."

An entire 80-bit time code is applied to every frame indicating hours, minutes, seconds, and frames. Like the code on checks, this film code can be machine read, which means that film editing, negative cutting, and sound interlock can be computer controlled, eventually making small numbers on the edge of the film a thing of the past.

Within those 80 bits of information, 32 are not designated for time code, so they provide space for encoding up to four caption characters alongside each frame of film. This is fast enough to have two different languages encoded and hidden on the same piece of film, Murray points out. The PBS caption decoder provides for a second language at a flip of a switch, provided the program has been captioned in two languages.

Once the method had been tried and shown to be feasible, a committee was formed by the Society of Motion Picture and Television Engineers (SMPTE) to study the data and establish a recommended practice for the industry. When this is accomplished, all equipment and materials must be manufactured to meet those standards, thus guaranteeing uniformity of materials and interchangeability of product. Murray is a member of this committee.

"Standards submission usually takes five years," he says, "but we have accomplished it for this process in a little more than a year, thanks to the whole-hearted industry cooperation we received."

—Lynne Williams

Beyond



The

IVORY TOWER

When the guidelines were written for the establishment of NTID in 1966, this mandate was clear: research, an endemic component of the total educational process, must be designed to have an impact beyond the confines of RIT in its application. This research, a major part of NTID's "Outreach" efforts, has been highly productive and successful. One Outreach-related project stemming from each of NTID's three main research departments—Educational Research and Development, Communication Research, and Institutional Planning and Research—is outlined below.

Tutor/Notetaker Training

During the early years of NTID, most research was directed to support services. A number of questions were posed to deaf students regarding the use and importance of various educational tools. This early research concluded that students attach great importance to the printed text and notes in their instruction. Consequently, research and development activities focused on improving text comprehension and utilizing notes and tutoring.

Developed as an educational tool in 1969, notetaking still is considered an important service, as evidenced by the popularity of the "NTID Notetaker," a loose-leaf binder containing pressure-sensitive paper. To date, more than 50,000 "Notetakers" have been purchased by students and staff in other educational institutions serving handicapped students worldwide.

When NTID was established in 1968, there were no special educational programs for deaf students; thus, the 70 students in NTID's first entering class were placed in classes at the other colleges of RIT. In the course of this initial mainstreaming, it was discovered that interpreters alone could not satisfy the needs of all deaf students. Students could not watch the interpreter and concentrate on taking notes at the same time. In addition, many students trained in the oral-aural tradition were not familiar with manual communication, and saw notes as their primary support service.

A notetaking procedure for deaf students using volunteer students was initiated by Dr. Ross Stuckless, director of NTID's Office for Integrative Research. This procedure was replaced for a number of reasons. As the glamour of being a notetaker for the newly introduced students wore off, the number of willing volunteers decreased. As the system was refined, it became evident that the quality of the notes was crucial to

students, and that a program training students as paid notetakers *and* tutors would ultimately be of more value to hearing-impaired students. Trained tutors who attend classes and write notes can help students review the notes as well. The tutor/notetaker, to be most effective, needs to know the course material already, and volunteer class members could not meet this requirement.

As a result of research conducted by questionnaire, the "NTID Notetaker" has taken several forms since the original design was produced by Dr. Stuckless. The present version is a vinyl loose-leaf notebook which opens at the top. A rear flap which extends up under the front cover aids in keeping the pressure-sensitized paper from picking up one page's worth of notes on several pages. All the various modifications necessary were discovered through the process of trial and error. Educational specialists on NTID support teams were heavily involved from the beginning of the program, as they still are, thus ensuring continual interaction with the persons using the methods and materials.

Once NTID's facilities were built and programs developed, support teams were established to aid NTID students cross registered in RIT courses. The support teams are made up of NTID professionals with expertise in education of the deaf, plus professional credentials in specific disciplines of the other programs

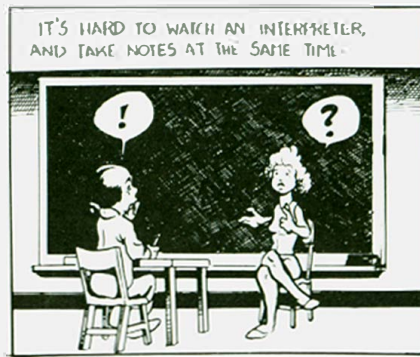
of RIT. Each college, such as Engineering, Business, and Photography, has a support team of NTID professionals. Tutor/Notetaker (T/N) support services are the responsibility of managers within these support teams, while trainers Jimmie Joan Wilson and John Panara have their offices in the NTID complex. Wilson, an assistant professor, was the first manager for the General Education Support Team before assuming the coordinator's position in December 1978. Panara was a research assistant involved with Dr. Russell Osguthorpe and the late Beth Duffin in finalizing the original research which led to the Tutor/Notetaker Training Program (T/NTP).

The support teams define needs and train T/Ns in order to maintain a pool of 150. This group provides services for more than 200 deaf students enrolled in 400 RIT classes.

Much of the present training and management program is the result of research spearheaded from 1975-77 by Osguthorpe and Duffin with the assistance of Panara and educational specialists. Osguthorpe, with Wilson, Panara, and Warren Goldmann, NTID associate professor of technical mathematics, wrote *The Manager's Guide*, a companion volume to *The Tutor/Notetaker*, Osguthorpe's first publication on the program. Both manuals were accepted for publication in 1980 by the Alexander Graham Bell Association for the Deaf, and are commercially available.



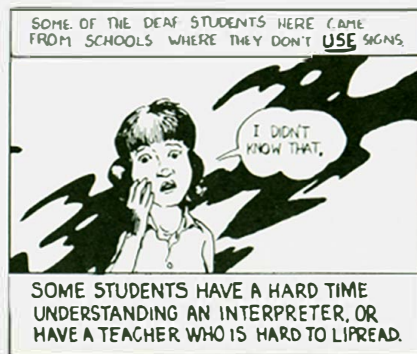
The first outreach on this project was done during the early stages, when field testing was conducted at six other schools, three of which offer services to other disadvantaged student groups. Programs for the deaf at Seattle Central Community College and St. Paul (Minn.) Technical Vocational Institute have active T/N training programs and are extending outreach to schools and programs in their vicinity. The T/N methods and materials are also in



use in public schools with programs for the hearing impaired.

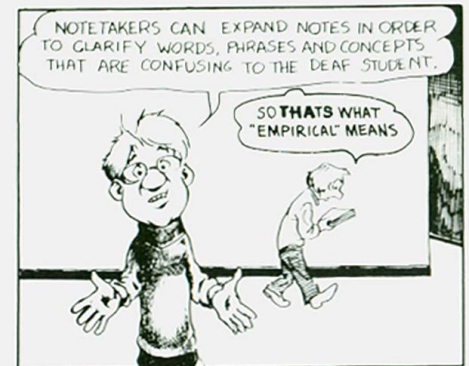
Educational Researcher Dr. Michael Stinson is looking at the T/NTP as it now exists. Students are evaluating what they find useful and what they do not, with an effort to explain why. Dr. Stinson's work should help other researchers find ways to evaluate various support services offered to deaf students, and to develop other programs to give students the information and skills they need to best utilize support services.

Since 1976, the T/NTP has trained 300 RIT students, 20 NTID professionals who either work as T/Ns, managers, or are otherwise involved on support teams, and 350 persons in 15 off-campus workshops across the country. Several hundred papers about the program have been distributed, and 3,000 comic books explaining the role of the T/N have been sold or distributed through workshops since early 1979. The T/N materials and methods have been presented at professional conferences such as the Council for Exceptional Children, the Alexander Graham Bell Association for the Deaf, and the Association on Handicapped Student Services Programs in Post-secondary Education.



This has been done by Wilson and Panara, the only personnel of the T/NTP in the Department of Educational Support Services Training. They solicit the help of many people from other areas within RIT who donate their time to the T/NTP.

Wilson says, "The cooperation has been beautiful, and it has given us a chance to recognize several RIT professors who are good examples of teachers of mainstreamed classes. It also rewards the excellence of people on NTID support teams and allows them to share the unique skills and knowledge they possess."



Communication Performance Profile

Another research project, begun in 1971, has become an integral part of the NTID Communication Program curriculum. At that time, a Communication Profile Committee was formed. It consisted of Drs. Donald Johnson, Joanne Subtelny, Diane Castle, William Castle, and Harry Levitt and Kathryn Harris of the City University of New York.

The committee selected a variety of tests to make up a "communication performance profile," which examines students' skill levels in six receptive and two expressive modes of communication.

The profile was developed as an aid to NTID's Communication Programs, whose primary goal is to help deaf students strengthen and/or develop those communication skills necessary for successful job placement and community involvement.

The receptive skills the profile examines are: hearing (speech) discrimination—how well the student receives information when audition is the only mode of reception; speech-reading without sound; speechreading with sound; manual reception; simultaneous reception; and reading comprehension. The expressive skills examined include both writing and speech intelligibility.

This comprehensive profile allows faculty to identify areas of communication strength and weakness so that each student can be counseled accordingly. A task force consisting of Drs. Johnson, Levitt, David McPherson, Subtelny, Richard Blasdell, and Kathleen Crandall generated a test selection and development manual to provide some guidelines for persons participating in future development of the communication profile.

The Communication Performance Profile Extension Project was begun at a workshop in 1977. The goal of the project was to provide a standardized approach for identification and development of test instruments to assess receptive and expressive communication skills of deaf students of all ages. Phase One of the project resulted in the guideline manual developed by the task force.

Phase Two reviewed tests currently in existence. The Alexander Graham Bell Association for the Deaf is considering commercial distribution of existing test instruments.

The communication profile was field tested in 1978 at two residential schools for the deaf to ascertain whether it could be used to test students at the secondary level. Phase Three of the project will focus on development of tests not yet in existence. Phase Four will implement the profile system at schools and agencies nationwide.

One segment of the profile dealing with characteristics of speech and voice was prepared by Dr. Subtelny, Nicholas Orlando, and Dr. Robert Whitehead, and is now being commercially distributed by the Alexander Graham Bell Association for the Deaf.

The communication profile should be of great value to public schools serving handicapped students as a result of Public Law 94-142. According to Dr. Johnson, the profile will serve the following purposes on a continuing basis: identification of students in need of communication skill development; interpretation of a student's communication skills not only to the student, but to teachers, family members, and others; development of a Communication Individualized Education Program for the student; facilitation of language and communication instructional planning and management; and evaluation of student characteristics and instruction.

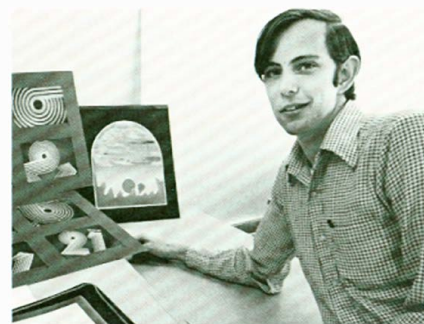
Graduate Follow-Up Project

The third major arm of research at NTID, Institutional Planning and Research, has for several years conducted a follow-up of deaf RIT graduates, and has assumed management of a similar project involving 19 secondary schools for the deaf. This project is coordinated by Charles Parker, manager of Institutional Planning and Research, and Janet MacLeod, research assistant.

The secondary programs' graduate follow-up was begun in 1979 at the behest of the Conference of Educational Administrators Serving the Deaf (CEASD). Chairman of CEASD's Educational Research Committee is Dr. Ross Stuckless.

Dr. Stuckless' position with CEASD afforded him the opportunity to communicate with superintendents of secondary schools for the deaf. The discussions prompted a decision to design and pilot a process to gather data on graduates.

Graduate follow-up is designed to serve several needs. First, it allows for institutional evaluation: Are schools accomplishing their goals and those of funding agencies? It also serves as an aid to evaluation of specific academic programs and degree offerings: Are schools producing quality graduates in terms of the needs of the marketplace? Finally, it provides information that counselors and placement professionals can share with students for program and career planning.



92.5 percent of RIT's deaf graduates are employed in jobs commensurate with their training.

As a result of Dr. Stuckless' chairmanship, CEASD took the lead in developing and piloting the project. A field test which included a questionnaire and a preliminary analysis was conducted in seven schools in 1980. CEASD wanted this project to continue and to expand to involve more schools. CEASD is not organized to provide ongoing support for such projects, and asked NTID to take over the responsibility for further development, refinement, and maintenance of an ongoing system of graduate follow-up.

NTID's Department of Institutional Planning and Research, with cooperation from Dr. Stuckless and the coordinators of the seven pilot schools, developed and implemented a system for the ongoing support of this effort. The number of schools involved grew to 19, including more than 50 percent of the secondary residential school enrollment nationally; a procedures manual was produced; and the second generation questionnaire was sent out.

It is anticipated that the findings from this second wave of questionnaires, to be published later this year, will encourage others to become involved in the project.

—Emily Leamon

IDEA TO REALITY

In striving to meet its commitment to the concept of applied research, NTID constantly attempts to infuse newly discovered knowledge and techniques into its instructional programs. Both teaching faculty as well as NTID's full-time research staff take an active part in this effort. Here are a few brief outlines of several of many research ideas that have become practical realities at NTID.

Reading & Writing Research

Roxanne Keach, an English instructor, and Jacqueline Kelly, an assistant professor in the Communication Division, jointly developed methods and techniques to strengthen the reading/writing skills of deaf students who already had fairly well-developed listening, speechreading, and speech production skills.

By contrasting the differences between ASL and English for certain students, Communication Division faculty members Joan Forman and Samuel Holcomb were able to increase English learning rates among that group.

Combining oral-aural usage with regular English grammar instruction, Communication Division faculty members Brenda Whitehead, Margaret Burke, and Andrew Malcolm significantly improved English skills of students with strong oral-aural communication skills.

Dynamic Audiovisual Interactive Device (DAVID)

Working with NTID's Instructional Television Department, faculty member Donald Sims developed a device designed to provide students with individualized support in acquiring speechreading skills.

Called DAVID, the system consists of a color television monitor, a modified videocassette recorder, and a mini-computer. Students type sentences into the computer after speechreading them, and receive assistance in how to improve their speechreading skills at their own pace.

Technical Signs

As the technological world spawned new and complex technical terminology, NTID faculty conducted research that led to the development

of a collection of technical signs for nationwide distribution.

Developed through the efforts of faculty members Dr. Frank Caccamise, William Newell, and Marilyn Mitchell-Caccamise, the technical signs vocabulary is an invaluable aid to instructors faced with the challenge of communicating complex concepts to students being introduced to these new concepts and to interpreters with little or no background in the expanding technology.

NTID plans to distribute more technical sign manuals in the future.

Educational Research & Development

The Department of Educational Research and Development, chaired by Dr. Gary Long, also has played a key role in turning research projects into valuable instructional tools or measurements. With his work in identifying cognitive skills, Dr. Long has improved methods of placing RIT's cross-registered deaf students in appropriate career areas.

Based on Dr. Michael Stinson's research into student comprehension of interpreted lectures, NTID faculty now know that it may be more effective to give students the most important information in the first part of their presentations.

Drs. Fred Dowaliby and Barbara McKee, assistant professors and research associates, are working on a 33-item Instructional Rating Survey covering teaching skill, teacher personality, organization of material, practical value, and personal usefulness.

Assistant Professor and Research Associate Dr. Rosemary Saur is assisting deaf students cross-registered into RIT's other nine colleges through her work in their special learning experiences.

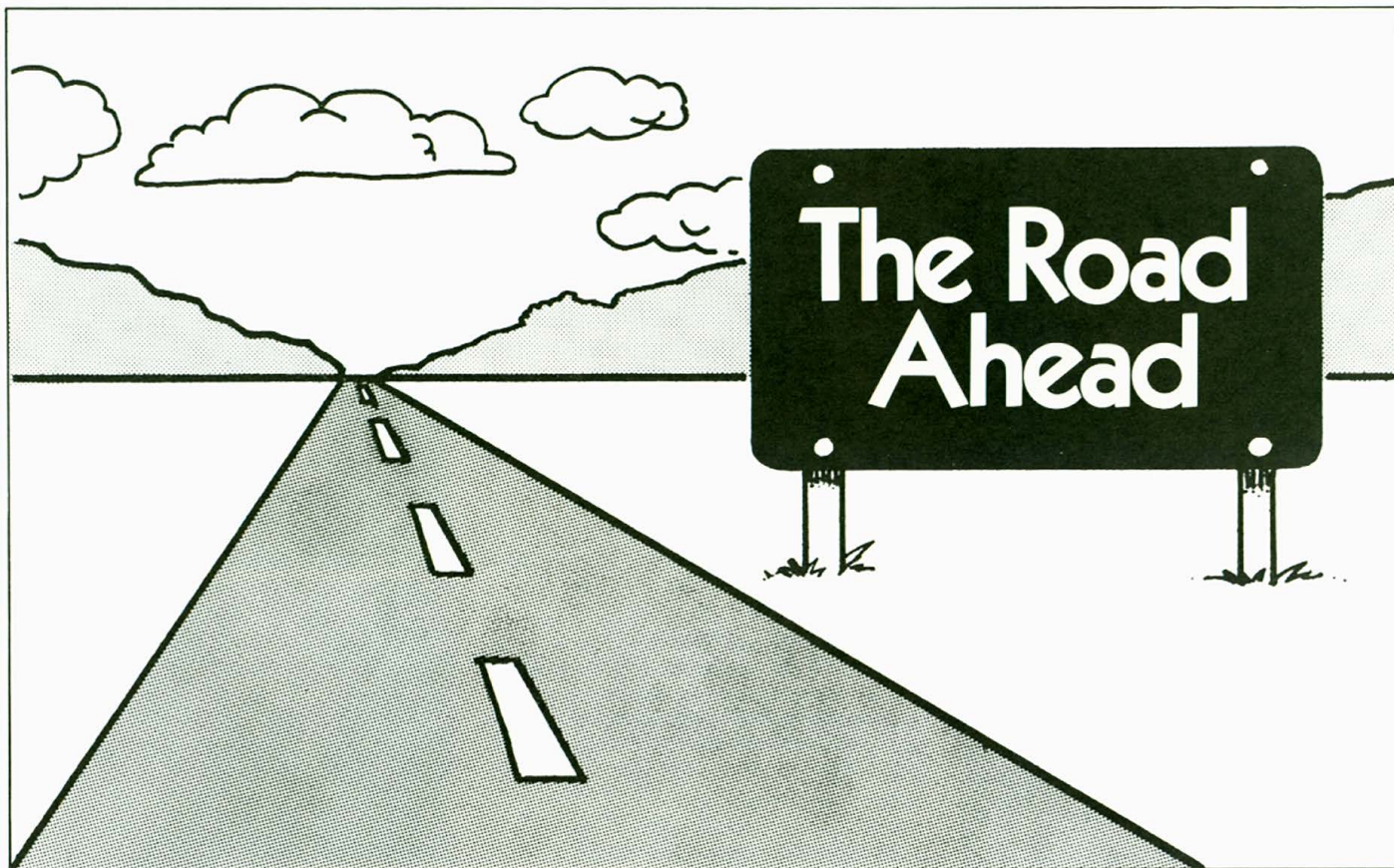
Jean Bondi-Wolcott, a research assistant in the department, working



NTID faculty members demonstrate technical signs in various disciplines. They are, top to bottom, Dr. Harry Lang, associate professor of technical mathematics, demonstrating "liquid," a physics sign; Dr. Bonnie Meath-Lang, assistant professor of English, demonstrating "comedy," an English sign; and Dr. Paul Peterson, associate professor of technical mathematics, demonstrating "fraction," a math sign.

with Dr. Long, has determined that videotape usage can improve interpreter understanding of course content in mainstreamed classes.

Dr. Long also is working with Dr. Wayne Garrison, an assistant professor and research associate, on a project designed to improve testing practices and tests used at NTID.



“We can take some satisfaction from NTID’s list of research publications, but we’re not driven by a publish or perish attitude as we might be if our emphasis were on basic rather than applied research. Of course it’s important that we share our findings, but it’s more important they be applied with deaf students. That’s what applied research is for, and that’s the task we were given by Congress.” This is the position taken by Dr. Ross Stuckless, director of NTID’s Office for Integrative Research.

What has been inherited from research over the last century or more? On the “down” side, a picture is presented of deaf children and adults faring badly in comparison with people who hear. It is a picture of poor speech, poor English, low academic achievement, and low income. Even the popular belief that deaf people compensate with better

seeing skills has recently crumbled.

Much of the variation in academic development among deaf children is tied to when they lost their hearing, how much hearing remains, and the socio-economic circumstances of their family. There’s not much a teacher can do about these things.

But on the “up” side, research has confirmed that the substantial majority of deaf children have normal or above normal intelligence. Their mental aptitude for learning is not impaired. Research has also demonstrated that amplification and auditory training can have a dramatic payoff for most hearing-impaired children.

Educational alternatives and opportunities for deaf children have increased considerably over the past two decades, all the way from pre-school through college. Technology has transformed many classrooms and extended communication possibilities through developments such

as telecommunication devices for the deaf and closed-caption television.

“I’d like to think that research at NTID is on the ‘up side’ and is focusing on what the deaf student can do under the right circumstances,” says Dr. Stuckless.

When NTID students were first admitted to the various other colleges of RIT in 1968, there were no similar programs elsewhere from which to borrow ideas. The staff was confronted with many practical problems, demanding quick and sometimes temporary solutions. Refinements could wait. In some respects NTID was one grand experiment.

Working closely with their colleagues, researchers tackled a wide range of problems pertaining to instructional support services, assessment techniques for advising and working with students on communication and their academic and vocational selections, instructional

strategies including the role of technology, and personal and social needs of students. Evaluation also figured prominently in NTID's research, monitoring and giving feedback to many development activities such as the training of new staff.

"It's quite uncommon for research to play such an active part in the growth of an educational program as it has here at NTID," says Dr. William Castle, RIT vice president and director of NTID. "I credit this largely to the fact that researchers and their colleagues with teaching and administrative responsibilities have worked together on the same questions. I expect this relationship and common purpose to continue."

As NTID looks to the future, many of the original questions still remain, although they may be more fine-tuned today than when they were first asked.



Dr. Ross Stuckless

Dr. Alan Hurwitz, associate dean for Educational Support Service Programs, sees as a priority for future research "the need for a stronger conceptual framework for integrating hearing and hearing-impaired students in learning activities, to give better direction to research which in turn will bring greater benefit to the student."

Dr. Barry Culhane, associate dean for General Education Programs, cites an example from among the many questions to be asked about mainstreaming. He asks, "How can we encourage more classroom dialogue and question-asking by hearing-impaired students?"

Broader issues posed by Dr. Culhane include questions about students' motivations, attitudes, and cognitive styles. "These are fundamental to a better understanding of the deaf student in terms of teaching and learning," Dr. Culhane adds.



Dr. Alan Hurwitz

Dr. Bruce Peterson, associate dean for Technical and Professional Education Programs, is not satisfied that we yet have adequate answers to some previously asked questions. As an example, he looks for more information on the role of the classroom interpreter in improving rate and quality of learning. He also has questions about the influence on learning of class size and number of hearing-impaired students in the class.

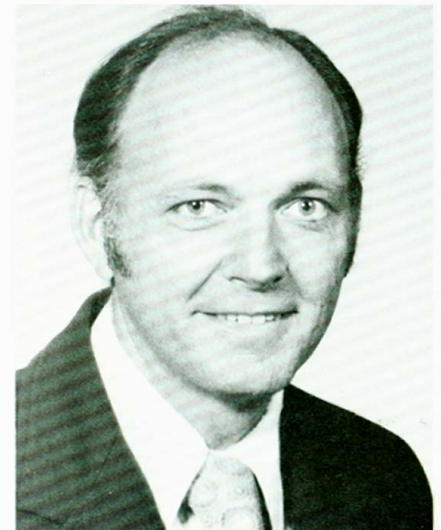
What does Dr. Peterson expect from research as a program administrator? He says, "Our collective professional experience is best verified through the application of objective and empirical evidence, and this evidence becomes the basis for exercising our professional judgement in pursuit of sharpening the learning experiences of our students."



Dr. Barry Culhane

Dr. Kathleen Crandall, associate dean and director of the NTID Communication Programs, stresses the importance of continued cooperation between researchers and instructors in her division. Their common goal is the improvement of the communication skills of students. She also urges researchers in her division to collaborate with people from other disciplines throughout and outside the Institute.

Many of the high priority questions for Dr. Crandall focus on reading and language. For example, she points out that little is known about the psychological processes used by deaf students as they read. She says, "In order for a person to be an independent learner, he or she must have access to the printed word."



Dr. Bruce Peterson

Research in the NTID Communication Division has been conducted on the use of sensory feedback in the perception and production of speech, and some of this is now being applied with students. Dr. Crandall says these are promising areas of investigation which will continue to receive priority, but are just two of the general areas which will need continued attention. She is optimistic about future outcomes from communication research "because all the faculty are thoroughly integrated into the research process."



Dr. Kathleen Crandall



Dr. Jeff Porter

Dr. Jeff Porter, director of the NTID Division of Human Development, sees the need for more research activity in the area of personal and social development. He points out that this is a difficult area in which to conduct meaningful, useful research, but says we must keep at it and not become discouraged by its complexity.

Dr. Jack Clarcq, associate vice president for NTID, stresses the critical importance of institutional research to the future vitality of NTID. He singles out the follow-up studies of NTID graduates as a good example.

"There was a time before deaf students began to graduate when we were guided by judgement but few facts about the likely outcomes for our graduates," he says. "But today, and even more in the future, we will have the feedback from our graduates which is so important for program evaluation and planned change."

Where is NTID heading with research? Dr. Castle puts it this way.

"NTID's goals haven't changed. We continue to face perplexing questions having to do with helping deaf people enter and remain in the economic mainstream, improving on the academic and vocational educational experiences of deaf students, reversing the pervasive effects of deafness on communication, and fostering the personal and social development of deaf young people. We will continue to rely heavily on a scientific approach to these goals. Research has served us well thus far, and I expect research to serve us even better as we move forward together."



Dr. Jack Clarcq



Dr. William Castle

It's a Long Way To Tipperary

Nearly a hundred years ago, Paul Sweeney's great-grandfather and grandfather emigrated from Ireland and settled in Washington, D.C. Both his grandfather and father attended Georgetown University. Then, most of the family moved to other parts of the country. Last year, however, the circle closed when Sweeney graduated from the National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT) and his first job as a graphic artist was with the Alexander Graham Bell Association for the Deaf, located just down the street from Georgetown University.

As a second generation American, Sweeney was very curious about relatives who might still be living in Ireland. As self-proclaimed genealogist for the family, he began researching his roots.

Part of his research was done first-hand when he traveled to Ireland in the summer of 1979, a year before he graduated from NTID's graphic arts program. He joined more than 200 other students from all parts of the United States for a four-week tour, sponsored by the Union of Students in Ireland, in conjunction with the Cultural International Educational Exchange.

"Most of our time in Ireland was on the 'bed and breakfast' arrangement, which means we were boarded with families who provided us with bed and breakfast," Sweeney explains. "The Irish are a very friendly people and I enjoyed being with them instead of in a hotel."

His face lights up as he describes a typical Irish breakfast. "It is the most important meal of the day and is bigger than either lunch or dinner," he says. "They serve orange juice, brown bread, tea, Irish bacon (half-way between American and Canadian bacon and very good), pork sausage, corn flakes, and fried or scrambled eggs."

Sweeney was interested particularly in Dublin since he knew his family came from that city. During his three-week stay there he managed to find the house where the family had lived, but he was unable to locate any relatives still in the area. Much of his research in Dublin was conducted at the Custom House, where family births, marriages, and deaths are recorded.

"I now know that my great-aunt's adopted son lives somewhere in Dublin, but I haven't been able to locate him," Sweeney admits. "I found an address for my great-aunt so now I can send it to a genealogist in Ireland or put an ad in the Dublin newspaper. I haven't decided how I will do it."

When he was not researching his family history, he traveled throughout Ireland, becoming familiar with the magical places he had heard about as a child—Tipperary, Donegal, Galway, Cork, Killarney, and Limerick.

"The countryside is very lush and green, probably because of the rainfall," Sweeney admits. "The weather was cloudy most of the time I spent in Dublin, with showers almost every day. Luckily, they usually lasted only about ten minutes and were light mists instead of the heavy downpours we have in New York and Washington."

In addition to Sweeney's four weeks in Ireland, he also spent two weeks traveling in England, Wales, and Scotland.

Violence still exists in Northern Ireland, but Sweeney stresses that "Nothing is really happening in the Republic of Ireland. However, I did see armed military men along the border, controlling traffic."

He continues to study his family's history, and even if he doesn't receive any responses to his newspaper ads, he plans on returning to Ireland, possibly as early as this summer.

—Lynne Williams



Paul Sweeney (far right) visits with two members of his "Irish family," Yvonne and Emily, and a fellow student traveler.



Thatched cottage on Aran Islands, County Galway, in western Ireland.



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