PROJECT SUMMARY

DRAMATIC SCIENCE WRITING APPLIED TO NON-SCIENCE STUDENTS

Applicant wishes to develop background and skills in expository and dramatic science writing. He proposes to apply such writing to high school populations. He will spend six months each year for two years with Professor Jon Franklin, Dept. of Journalism, Oregon State University. Prof. Franklin is recognized for his unique talents in dramatic and expository science writing.

The applicant's interdisciplinary background will aid in the design of Oregon State's new science writing program.

The applicant will acquire writing skills which will be applied to high school populations in Oregon and Utah. Articles will be published in selected high school student newspapers. The success (or lack of success) in reducing the science "fear" of high school students will be measured by examining enrollment trends in science courses at each high school. Two years are necessary in order to assess the effect of these approaches.

If time permits, and especially in the second year, applicant will begin to write a high school non-science textbook using dramatic science writing techniques.

TABLE OF CONTENTS

A. NSF Cover Page
B Project Summary
C Proposal
- Objectives
- Rationale
- Methods
- Significance
- People
- References

D. Personal Statement
E. Budget
F,G Host Scholar and Host Institution Letter
H. Curriculm Vitae
- Applicant: Joe Andrade
- Host Scholar: Jon Franklin

I. Results From Prior NSF Support
J. Not Applicable
K. Current and Pending Support
L. Letter from D. Pershing, Dean, College of Engineering, U of Utah

OBJECTIVES:

The major goal is to develop science interests and values in initially disinterested high school students using highly relevant and dramatic science-related stories in high school and local community newspapers. The applicant proposes to study dramatic science writing under the supervision of Jon Franklin of Oregon State University (OSU). The applicant will work closely with newspaper editors and writers in communities and high schools in Utah and Oregon in the writing and publishing of dramatic science-related stories and features.

RATIONALE:

"SO HOW DO YOU GO ABOUT TEACHING THEM SOMETHING NEW? BY MIXING WHAT THEY KNOW WITH WHAT THEY DON'T KNOW. THEN, WHEN THEY SEE IN THEIR FOG SOMETHING THEY RECOGNIZE, THEY THINK, "AH, I KNOW THAT!" AND THEN IT'S JUST ONE MORE STEP TO "AH, I KNOW THE WHOLE THING." AND THEIR MIND THRUSTS FORWARD INTO THE UNKNOWN AND THEY BEGIN TO RECOGNIZE WHAT THEY DIDN'T KNOW BEFORE AND THEY INCREASE THEIR POWERS OF UNDERSTANDING."

Picasso

How can one reach disinterested students? First, you must get their attention -- and then build from there.

How do you get the attention of students who claim to be completely disinterested in science? Sex is useful. So are cars. Sports -- and certain kinds of food and drink -- are effective. We must begin with a subject of interest to them.

How do you keep their interest? That's where Jon Franklin somes in -- and only a Jon Franklin can do it. By drama. By writing so dramatically that they can't put down the newspaper, magazine, or book once they start.

Dramatic science writing based initially on subjects of direct interest and relevance -- that's the idea.

I once taught high school biology (25 years ago!) to a parochial school class with serious disciplinary problems -- they had all been expelled from public schools. There was only one way to "teach" biology--sex. We studied sex from every angle and every part of the plant and animal kingdoms -- always with relation to human sex.

Their flourishing hormones provided sufficient motivation and relevance. And they learned a lot of biology.

Other relevant topics can and will be used, including sports, cars, environment, food and health, music, jobs and business, family, etc.

What media to use? I propose to use the nearly 100 Utah high schools and their student newspapers, as well as local community newspapers, including rural weeklies and monthlies. By working closely with local editors and publishers, one can publish stories of local relevance and interest. Oregon papers will also be used.

The key, of course, is relevance. We must start, as Picasso said, with what they know -- and with what interests them -- and then enhance, build, and expand. The cues to relevance are in the high school and local papers; other cues can be obtained by talking with high school teachers, community members, parents, etc.

Jon Franklin's book, *Writing for Story* (1), shows how to write dramatically. His Pulitzer Prizes demonstrate the effectiveness of his methods and talents (see his vita in Section H). I want to learn some of his skills and talents and couple them with what might be called Writing for Audience. Writers and scientists tend to write about what interests them. If we are to be effective educators, we must learn to write about what interests our students -- and then build, lead, and expand from that solid interest and motivational base.

People enjoy reading about themselves or their friends in the paper. We will use their interests, their peers, local celebrities and "heroes", popular movies, interesting local and regional events -- whatever it takes to get them to start to read --but it will be written so that they can't put it down. That's the idea.

METHODS:

I will learn how to write in a more effective and dramatic way using the methods described by Jon Franklin (1). I will spend six months each year for two years working closely with Franklin and his colleagues in the Department of Journalism at OSU. I will participate in the twice weekly dramatic science writing discussion group. I will use the time at OSU to prepare a variety of materials suitable for high school populations.

I will meet and work closely with high school newspaper editors and their faculty advisors, in Utah and in Oregon. I will review past issues of the papers, including local community newspapers, and identify subjects and issues of relevance, upon which to build dramatic science stories.

Working with local educators and with their administrative officials, we will divide the high schools into experimental and control groups containing matched schools of comparable characteristics. Criteria would include size, higher education aspirations, economics, racial/ethnic mix, urban/rural nature, science course enrollments, etc.

The science interests and enrollment in each of the schools will be measured at the beginning of the project and then each year for the next several years (I hope to raise the funds to continue the project beyond the two year fellowship period).

The results would be summarized and presented at state and national conferences and submitted for publication. If the experiment is successful (as measured by a significant increase in science interests, values, and course enrollments), then I will initiate two additional projects:

1. Preparation of a popular book, perhaps to be called Writing for Audience; and

2. Preparation of a high school non-science textbook using relevant and dramatic science writing. One possibility is Driver Education, a course taken by nearly every high school student in the country because it's required in most states to get a Driver's License. Both relevance and motivation are there-- so are chemistry (combustion), physics (force, velocity, acceleration, momentum, optics, friction, electricity),, materials (metals, plastics, rubber), biology (vision, reaction times, health, physiology), and even some mathematics.

The problem of motivating and teaching the teachers is another issue and cannot be discussed here.

SIGNIFICANCE:

A wide range and variety of reports in recent years have identified and discussed the problem of the education of our population. One such report (2) has noted five "...significant causes for the drop in learning of the nation's college-bound students:...", including a "...diminished seriousness of purpose and attention to mastery of skills and knowledge..." and "A marked diminution in young people's learning motivation."

That report focused on college-bound students. Of equal, and perhaps greater, importance are the education and the values of non-college-bound students and of their families and friends. That is the problem to which I would like to make at least a small contribution.

PEOPLE:

Jon Franklin is Chairman of the Dept. of Journalism at OSU. His vita is in Section H. Jon has won a number of prestigious writing awards, including two Pulitzer prizes, one for explanatory journalism (1985) and one for feature writing (1979). He was awarded the J T Grady medal for science popularization of the American Chemical Society in 1975. Dr. Franklin is the author of *Writing for Story* (1) and *Molecules of the Mind* (3), as well as several other books. His fans are eagerly awaiting his books in press and in preparation (see Vita). Jon Franklin assumed the chairmanship of OSU's Dept. of Journalism in September, 1989.

Pam Fogle, Director of News Services for the University of Utah (U of U), will provide assistance in reaching newspaper editors and publishers in Utah. During my stays at OSU, I will work with her OSU counterpart to reach the Oregon press.

Patricia Goldsmith, Director of the U of U's Office of High School Services, will help with information and input regarding Utah high schools.

Others on campus (U of U) who are interested and have agreed to help include:

Dr. Jeri McEntire, Associate Vice President for Academic Affairs and Professor of Communications; Professor McEntire has science writing experience;

Prof. James Andersen, Chairman of the Dept. of Communications; and

Dr. Michael Ruddick, Director of the Writing Program.

REFERENCES:

1. Jon Franklin, *Writing for Story: Craft Secrets of Dramatic Nonfiction,* New American Library, 1986.

2. B. F. Brown, *Crisis in Secondary Education*, Prentice-Hall, 1984.

3. Jon Franklin, *Molecules of the Mind: The Brave New Science of Molecular Psychology,* Dell Publishing Co., 1987.

D. PERSONAL STATEMENT

I am a successful academic scientist/engineer with over 150 published technical papers and book chapters, five edited books, about $400,000 in annual research funding, and a 20 person research group. My work is interdisciplinary and covers a wide range of life science, physical science, engineering, and medical areas.

Running a large research group is a more than full time occupation, with little or no time for issues and activities of general societal importance. I am beginning to phase out the bulk of my research committments and activities in order to devote a major portion of my time to the activities described in this Professional Development Award proposal and in an accompanying research proposal to the Ethics and Values Studies Program.

Observation, analysis, and objectivity are necessary -- vital -- traits for each citizen of a democratic society. These traits can be effectively developed and enhanced by exposure to and experience in the sciences.. Those traits are not present in the bulk of our citizenry, nor, unfortunately, in many of our elected and appointed officials.

Science is curiosity, observation, discovery -- and common sense -- and can be imparted and taught in relevant and effective ways. What is required is a means to decrease the endemic fear of science and fear of learning which pervades most segments of our society.

I want to prepare myself to work and to be effective in a number of general societal issues, particularly the development and enhancement of science education, values, and ethics in the non-science segments of society. Although my speaking and presentation skills are good, I want to learn to write in a far more effective and dramatic manner -- a skill which is essential if I am to reach and to motivate initially disinterested students -- and their parents and teachers.

Dramatic and popular science writing is the forte of Jon Franklin, now at Oregon State University (OSU). I want to learn from him.

The country has serious educational problems. Instead of simply talking and complaining about these problems, it is time for personal action. My kids are grown and gone, my wife is an elementary school teacher and is very supportive of this project, and -- after 25 years as a scientist/engineer in academia -- it's time for a change! Hence this application.

F. G. HOST SCHOLAR AND HOST INSTITUTION LETTER

NATIONAL SCIENCE FOUNDATION
STUDIES IN SCIENCE, TECHNOLOGY & SOCIETY

INFORMATION FROM SCHOLARLY ADVISOR

JOSEPH ANDRADE has applied for an NSF Postdoctoral or Professional Development Award in Science, Technology and Society and proposes to conduct a research and study project at your institution. Selection of award recipients will be based on the value of the educational and study program you will undertake with the applicant, the significance and intrinsic merit of the proposed project, the perceived research competence and potential of the applicant, and the suitability and availability of the sponsoring senior scholar and host institution. On an attached page, please briefly describe your qualifications and current research and explain how the applicant's project and the study plan which you have developed with the applicant would fit into your program. It would be helpful to describe other persons with whom the awardee would work both in research and study. Also needed is an abbreviated version of your curriculum vitae (limit publication list to the past five years).

Dr. Franklin's letter will be mailed directly to the Studies in Science, Technology and Society Program. Due to time and schedule constraints it was not possible to include it with the application.

Typed Name, Title and Institutional Affiliation:

JON FRANKLIN, CHAIRMAN
DEPT. OF JOURNALISM
OREGON STATE UNIVERSITY
CORVALLIS, OREGON 97331

Signature

Please return this form to the applicant

Deadline for submission to NSF: November 15

September 26, 1989

Curriculum Vita

JON FRANKLIN
Professor and Chairman
Department of Journalism
Oregon State University
Corvallis, Oregon 97331-2211

Telephone: Office: 503 737-3109; Home: (503) 929-3284

Birthdate: January 12, 1942

Birthplace: Enid, Oklahoma

Education: B.S. (With high honors), University of Maryland, 1970
Doctor of Humane Letters (honorary), University of Maryland at Baltimore County, 1981
Doctor of Humane Letters Honoris Causa, College of Notre Dame of Maryland, 1982

Current position: Professor (tenured) and Chairman
Department of Journalism
Oregon State University
Corvallis, Oregon 97331-2211

Agent: Dominick Abel, 498 West End Avenue, 12C, Ne York, N.Y. 10024, (212) 877-0710

Major Awards: Pulitzer Prize for Explanatory Journalism, 1985
Penney-Missouri Special Journalism Award, 1985
Helen Carringer Award, National Association for Mental Health, 1984
Pulitzer Prize for Feature Writing, 1979
Keep America Beautiful Award, 1977,
Talbot Denmead Memorial Conservation Award, 1977
James T. Grady Medal for science popularization, American Chemical Society, 1975

Other Semifinalist, Journalist-in-Space Program, 1986

Books: America in Amber, Simon and Schuster (In ms; 1990)
The Molecules of The Mind, Atheneum, (1987) (Dell Laurel paper)
Writing for Story, Atheneum, (1986) (NAL paper)
Guinea Pig Doctors, (With John Sutherland, M.D.) Morrow, (1984)
Not Quite a Miracle, (With Alan Doelp) Doubleday, (1983)
Shocktrauma, (With Alan Doelp) St. Martin's Press, (1980)

Books in Progress: The Story of Psychology, Scott-Foresman (Under contract), 1990. An introductory textbook.
The Way of Science, (in preparation). A layman's introduction to the world of science and scientists.
Blue Smoke and Mirrors, (in development). A guide to devices, tricks and techniques used in literary journalism.
Writing for Idea, (in preparation). A companion text to Writing For Story.

Editorial Boards:
Board of Editorial Advisors, Washington Journalism Review, 1987 to 1989

Consulting:
Occasional writing coach and literary advisor to The Virginian-Pilot / Ledger-Star, Norfolk, Va.

Academic Appointments:
Oregon State University
Professor (tenured) and Chairman of Journalism 9/89 to present
University of Maryland at College Park
Associate Professor (tenured) (1/86 to 8/88)
Professor (8/88 to 8/89)
University of Maryland (Baltimore County)
Senior Lecturer (part-time) (1984-1985)
Towson State University
Visiting Associate Professor (1979-1983)

Professional Experience:
The Evening Sun, Baltimore (1970-1986)
The Prince Georges Post, (1968-1970)
U. S. Navy Journalist (1959-1967)
Attack Squadron 144 (1959-1962)
COMCRUDESPAC 3, (1962)
All Hands Magazine (1962-1967)

Articles, Chapters and etc. (1986 to present):

"Science Writing in Its Age of Yellow Journalism," Science for the Fun of It: A Guide to Informal Science Education, edited by Marvin Druger, National Science Teachers Assn. 1988.

"Attention and Our Ancient Past: The Scaly Thumb of the Reptile," American Behavioral Scientist, (1/88, Jon Franklin, Lewis Donohew and Vikrant Dhoundiyal.

"Literary Journalism: Beyond the Myth (A Practitioner's Perspective)", Journalism Educator, Fall 1987.

"A Madness Called Depression," Notre Dame Magazine, Spring 1986.

"Humanizing Science Through Literary Writing" and "The Annotated Mrs. Kelly," chapters in Scientists and Journalists: Reporting Science as News, 1987.

"How The World Works: Guide to Science's Greatest Discoveries; a book review" Science 86, May 1986. (pp 75).

"Relevancy in Science,"Chemtech, March 1976.

Selected Major Newspaper Stories and Series

BRAVE NEW HEART / A TRANSPLANT PATIENT'S STORY -- This 10-part action profile, published in The Evening Sun August 5 through 16, 1985, focused intensively on the experiences of a single heart transplant patient, Lorenz Buchser. The story, designed to help the reader grasp the profound human experience of this new form of surgery, followed the Buchser case from first symptom, through surgery, recovery, immunosuppressive therapy, and finally to his return home. The series won the Penney-Missouri Special Journalism Award in 1985.

MIND GENES -- This five-part series, printed in The Evening Sun beginning April 1, 1985, focused on the growing body of evidence in favor of a genetic role for mental illness. Perhaps the first major exploration of this then-controversial subject by the media, the series explained the link between genes, mind chemistry, and behavioral aberrations.

THE MIND FIXERS -- This major explanatory series, published in The Evening Sun July 23-31, 1984, focused on the revolution in neurochemistry and its implication for the treatment of mental illness. The following year it won the Helen Carringer award and the inaugural Pulitzer for explanatory journalism.

THE SCIENCE OF ROMANCE -- This four-part series, published in The Evening Sun beginning February 13, 1984, explored the evidence bearing on evolved sexual and romantic behavior in the human species. The series, which focused on the research and theories of physical anthropologist Helen Fisher, was the first of a "series of series" designed to familiarize the reader with the developing new discipline of molecular psychology.

TRACKING THE GHOST CAT -- This five-part series, published in The Evening Sun beginning January 16, 1987, focused on the physical and psychological travails of a biologist whose misfortune it was to be assigned by the federal government to prove the Eastern Cougar no longer survives. Since it is essentially impossible to prove a negative, the assignment resulted in the warping of the biologist's personality. This series was designed to illustrate the absurdities which often result when science is caught up in emotional political battles.

THE BIRTH OF A PLANET -- This three-part series, published in The Evening Sun beginning August 29, 1983, documented the discovery by infrared astronomers of a debris ring around the young star Vega. The discovery was critical because it demonstrated for the first time in scientific terms that other stars almost certainly have planets.

THE SANDBRAINS ARE COMING -- This seven-part series, published in The Evening Sun beginning April 25, 1983, explored the scientific, economic and social dynamics swirling around the dawn of the age of industrial robotics.

THE BALLAD OF OLD MAN PETERS -- This five-part action profile, written in saga form, was published in The Evening Sun in January of 1983 and widely reprinted, including in Readers Digest. It focused on the dramatic, life-long struggle of a black man, born in rural Texas in 1900, to attain literacy and world-awareness.

THE VANISHING TRIBE -- This three-part series, published beginning July 21, 1987, in The Evening Sun, followed archaeologists as they sifted through the evidence of a massacre that occurred in South Dakota some 600 years ago. The research was important to the controversy over whether or not the human species is naturally violent.

MT. SAINT HELENS -- This intense coverage began three weeks before the May 18, 1980 explosive eruption and continued for two weeks after. It included first-person accounts from the mountainside during steam eruptions and earthquakes, geological explanations of what was occurring, the first report of mountain swelling at the site of the eventual explosion. The aftermath coverage included new in-depth explanatory material.

MRS. KELLY'S MONSTER -- This drama-form feature was printed in The Evening Sun in December of 1978. It provided an up-close view of the modern neurosurgical operating room. It won the inaugural Pulitzer for feature writing in 1979. Widely reprinted, including in Readers Digest.

THE CHESAPEAKE AT BAY -- A 10-part series focusing on the ecological health of the Chesapeake Bay. The series, published in 1976 in The Evening Sun, considered the bay's geographical and geological history, its hydrologic and biologic fragility, and the socio-economic factors involved in increasing pollution. It won the Keep America Beautiful Award and the Talbot Denmead Memorial Conservation Award.

ALCOHOLISM IN MARYLAND -- This "patterned coverage" of problems with Maryland's alcoholism treatment programs ran in The Evening Sun throughout 1975. It focused attention on the severe economic, structural and philosophical shortcomings of Maryland's programs, and led to wide-scale improvements.

HIGH BLOOD PRESSURE -- This five-part series was published in The Evening Sun in 1974, just as the dangers of hypertension were becoming clear to medical scientists. The series, which was cited by area physicians as an example of public-interest science writing at its best, informed the reader of the new findings and detailed the dangers posed by even small rises in blood pressure.

ON THE TRAIL OF CANCER -- This four-part series, published in The Evening Sun August 27 through 30, 1973, detailed the subtle ways that viruses may enter and transform the living cell from normal to cancerous -- and the high-tech methods of medical sleuths to follow the viral "footprints."

A TREK THROUGH TIME -- This five-part explanatory series on the geology of Maryland ran in The Evening Sun October 2 through 6, 1972. The series wove together the relevant sciences, from chemistry and physics to paleontology and geology to explain the complex geological history of the state. The series was cited by the American Chemical Society in awarding the 1975 Grady Award.

Research Projects:

1. Development of interview objectives, techniques and analysis procedures to be used in the Biotechnology Awareness Study. The study is funded by the National Library of Medicine and is being conducted by Southeastern/Atlantic Regional Medical Library Services (which is based at the University of Maryland Health Sciences Library).

2. Ongoing development, with writer/computer programmer Alan Doelp, of a computer program to measure and graph pacing devices and verb densities used by student and professional writers. A preliminary pacer program has already been developed.

3. Exploratory research aimed at recording word processor keystrokes by writers. The goal is the development of a method by which the writing process can be reconstructed and the writer's "microdecisions" analyzed. The process would be used both for research and teaching.

Major Lectures:

"Biotechnology and the Age of Yellow Science Journalism," University of Maryland's lecture series in Science, Technology, and Society Studies and History and Philosophy of Science, College Park, Md., April 20, 1989.

"Living to 2001 and Beyond," Tuckahoe Woman's Club, Richmond, Va., January 4, 1989.

"Science Writing as Literature," National English Teacher's Association, St. Louis, Mo., March 14, 1988.

THE UNIVERSITY OF UTAH

November 9, 1989

Reviewers
National Science Foundation
Program in Studies in Science, Technology and Society

Dear Colleagues:

J. D. Andrade, Professor of Bioengineering and Materials Science at the University of Utah, is applying for a National Science Foundation Professional Development Award in Studies in Science, Technology and Society.

Dr. Andrade proposes to work six months each year for two years with Professor Jon Franklin, Chairman of Oregon State University's Department of Science Journalism.

I am pleased to endorse Dr. Andrade's application. He is one of the most outstanding faculty in our College and he believes strongly in this project. I will make the arrangements necessary to temporarily relieve Joe Andrade of his chairman's and teaching duties during the course of the NSF Professional Development Award.

Our College is very interested in this proposed project and in the interactions and relations between technology and society. I view Dr. Andrade's Professional Development Award as a first step in a growing awareness and activity of such issues and studies among our faculty.

Sincerely,

David W. Pershing
Dean of Engineering

DWP/par

cc: J. Franklin
J. Andrade

College of Engineering
Office of the Dean

2202 Merrill Engineering Building
Salt Lake City, Utah 84112
Telephone (801) 581-6911
FAX (801) 581-8692