

FACULTY RESEARCH



1972-74

M E M O R A N D U M

TO: Faculty of Morehead State University

FROM: Faculty Research Committee
Ted Pass II, Chairman



DATE: May 3, 1976

Morehead State University presently provides research funds to assist faculty members who desire to conduct research and are in need of financial assistance. Research proposals are to be presented to the Faculty Research Committee. This committee assists the Bureau of Research and Development with the administration of the fund for faculty research and functions to promote research activity within the academic community, to evaluate research proposals, and to govern the terms of the research grants. The research may reflect faculty interests in research related to either an academic area or to University and regional problems.

The compendium of research abstracts containing research projects supported by the University during 1972-73 and 1973-74 is being distributed to the University community to make them cognizant of the research that is being conducted by members of the faculty.

The Faculty Research Committee would like to encourage interested faculty members to submit a research proposal by October 1, 1976 for consideration by the committee for funding during the 1976-77 academic year.

If more information is desired, please contact the chairman of the faculty research committee or your school representative.

TP/js

INTRODUCTION

The faculty research program was initially established by Dr. Adron Doran, President, to provide funds to support small faculty research projects. It was envisioned that the program would encourage faculty members to do research which would provide new knowledge and continually upgrade the teaching and service functions of the University.

The program is administered by the Bureau of Research and Development through the faculty research committee. The committee solicits, reviews, and approves research proposals submitted by faculty members.

This compendium of research abstracts is the result of projects supported by the University during 1972-73 and 1973-74. These abstracts are presented in order to inform the reader of the wide range of research projects conducted by faculty members at the University. If more information is desired on any particular project, the researcher should be contacted. It is hoped that the dissemination of these abstracts will be of service to the readers.

Morris Norfleet
Vice President
Research and Development

APPLIED SCIENCES AND TECHNOLOGY

FAMILY PLANNING BIBLIOGRAPHY

By
Betty B. Bailey
Associate Professor
Department of Home Economics

A great need exists for information on family planning. Recently, public services agencies have started providing family planning information through formalized programs. Printed materials on family planning are limited and their availability compounded by the fact that some knowledge in family planning is necessary to know where to find related materials.

The writer initiated an extensive research for publications, films and other materials related to family planning. Contents of the collected materials were analyzed, evaluated, annotated and organized into a complete file of subjects related to family planning. The bibliography contains approximately 2,000 entries. The entries are arranged by type (Books, Articles, Audio-Visual Aids, Pamphlets, Papers, Studies) and by topic.

EXPERIMENTAL APPLICATIONS OF POWER MECHANICS AND FLUID CONCEPTS FOR HIGH SCHOOL INDUSTRIAL ART STUDENTS

By
Dennis Karwatka
Assistant Professor
Department of Industrial Education
and Technology

The problem under investigation was to overcome the resistance of some high schools to implement a power mechanics lab program in their schedules. Many administrators are of the opinion that it's necessary to utilize expensive equipment to teach meaningful procedures in this area.

The method used was to develop laboratory experiments which would utilize inexpensive and readily available equipment.

The essential result was the publication of three volumes of lab manuals which included 24 experiments suitable for high school Industrial Arts students. One set of experiments was sent free of charge to each high school in the state of Kentucky.

The research was concluded with the successful completion of the lab books and the mailing of approximately 300 copies on or about 15 September 1974.

EDUCATION

**MOTIVATIONAL PROPERTIES OF CONTROLLABLE
VS.
UNCONTROLLABLE STRESS**

By
Francis H. Osborne
Associate Professor
Department of Psychology

Previous research has suggested that escapable shock is less aversive to animals than inescapable shock when suppression of behavior is employed as an index of fear. The purpose of this research was to determine whether or not these findings could be generalized to other indices of conditioned fear.

Experiment I employed signaled escapable or inescapable shock followed by a hurdle-jump task affording escape from the fear eliciting stimuli. The results demonstrated that animals which first received signaled escapable shock were significantly more proficient in learning the hurdle-jump escape response than animals exposed to signaled inescapable shock. As superior hurdle-jump performances in this task are generally assumed to reflect greater fear, Experiment II was undertaken to determine whether the disparity in results could be due to methodological differences between Experiment I and previous response suppression experiments. Experiment II employed the same apparatus, signal, shock intensities and schedule as Experiment I. A signal was then superimposed on an ongoing appetitive bar-pressing task. Inescapable subjects suppressed their bar-pressing rate of response more than escapable subjects in Experiment II, which was consistent with previous suppression experiments. Activity measures taken before and after the signaled shock sessions in both Experiment I and II revealed no activity differences following escapable or inescapable shock.

It was concluded that escapable—inescapable shock may not result in motivational or conditioned fear differences between groups. The groups may have differed, however, in the modes of response learned under the two conditions. Further research needs to be done in this area to evaluate such a possibility.

**EFFECTS OF CONTROLLABLE
VS. UNCONTROLLABLE STRESS ON LEARNING**

By
Francis H. Osborne
Associate Professor
Department of Psychology

Three experiments are reported in which rats first received 50 escapable or inescapable signaled shock trials. Experiment I (n=22) employed an acquired drive paradigm and found escapable shock subjects learned a hurdle-jump response to escape the signal more rapidly than did inescapable shock subjects. Experiment II (n=24) employed a CER paradigm and found escapable shock subjects suppressed less when the signal was introduced in the appetitive bar-pressing task. Both experiments measured spontaneous activity immediately following conditioning and found no group differences. Experiment III (n=39) employed the same activity task and found no differences between escapable and inescapable shock groups when the signal was introduced into the activity

task. Both groups displayed less activity than a non-shock control group during the signal. The results suggested that control over the shock in the conditioning phase did not result in a reduction of conditioned fear but may have produced "learned helplessness" on the part of the inescapable shock subjects or differences in response mode for either group.

Preliminary results were presented to the psychology section at the 59th annual meeting of the Kentucky Academy of Science at Lexington, Kentucky in November, 1973. The research was reported at the 82nd annual meeting of the American Psychological Association in New Orleans in September, 1974.

A SURVEY AND COMPARISON OF CRITICAL FACTORS AFFECTING STUDENT TEACHER MORALE

By
**John W. Payne, Director
Professional Laboratory Experiences
Department of Education**

The purpose of this study was to determine student teacher morale concerning selected factors relative to sex, program, academic major, and national norms. A fifty percent (50%) sample of each academic major (n=262) represented at Morehead State University was selected and administered the Purdue Student Teacher Questionnaire.

As a group, the student teachers reported a high degree of morale. The differences relative to sex were not significant. Differences relative to elementary or secondary programs were significant on five of the twelve factors. The elementary student teachers were more positive on four factors, while the secondary student teachers were more positive on only one factor.

Significant morale differences relative to academic majors were reported. Business Education and elementary student teachers reported the highest morale on nine of the twelve factors. The lowest morale scores were reported by Art, Home Economics, Music, and Speech student teachers. As a group, the 1974 student teachers ranked above the national norms on nine of the twelve morale factors.

CONVERGENT AND DISCRIMINANT VALIDITY OF THE
BARCLAY CLASSROOM CLIMATE INVENTORY

By

George S. Tapp

Associate Professor

Department of Psychology & Special Education

Publication costs were provided for the article "Convergent and Discriminant Validity of the Barclay Classroom Climate Inventory" which appeared in *Educational and Psychological Measurement*, 1974, Volume 34, pages 439-447. An abstract of the article, co-authored with James R. Barclay, School of Education, University of Kentucky is as follows.

The purpose of this study was to investigate the convergent and discriminant validity of a multimethod, multitrait inventory used for assessing the climate of the elementary classroom. Using self-report, peer judgments, and teacher ratings, the inventory employs the multimethod, multitrait factor analysis approach to determine the quality of social interaction and affective variables in the classroom. A computer processing procedure utilizing criteria developed in this approach scores, analyses, and develops a written report on the pupil. These reports can be cumulated to result in descriptions of the social and interaction and affective environment in the elementary classroom.

A questionnaire comprised of short paragraphs defining the major factors from the inventory was administered with the inventory to nine elementary classrooms. Each student rated himself for each of the factors (for males, Affiliation, Dominance, Seclusiveness, Physical Skills, and Intellectuality; for females, Dominance, Aggression, Seclusiveness, Affiliation, and Intellectuality) and was in turn rated by a randomly selected peer and the teacher. These three rating sources combined with the inventory's factor scores to form a five-trait, four-method matrix for the assessment of convergent and discriminant validity. Considerable evidence for these aspects of validity was found.

A COMPREHENSIVE ANNOTATED BIBLIOGRAPHY ON TECHNICAL WRITING

By
Donald H. Cunningham
Associate Professor
Division of Language and Literature

English teachers and others who teach technical writing have long needed a comprehensive annotated bibliography on technical writing. Seventeen major bibliographical references were searched, 3" x 5" bibliography cards were filled out for each item identified, and these cards were arranged alphabetically by author(s) or editor(s). The project has resulted so far in publication of two articles, establishment of a national bibliographical committee, and submissions of proposals for publishing two anthologies of material on teaching technical writing. Although little of the bibliography has been annotated, that work will continue until all material has been annotated.

Publications

"Toward a Comprehensive Bibliography of Technical Writing," *Journal of Technical Writing and Communication*, 3 (winter, 1973), 39-45.

"Bibliographies of Technical Writing Material," *The Technical Writing Teacher*, 1 (Winter 1974.) 9-10.

RESEARCH IN AFRICAN-AMERICAN ART

By
Maurice Strider
Associate Professor of Art
Department of Art

The purpose of this research is to aid in bridging the information gap in humanities and world art history courses in the area of African and Afro-American art. Through my research grants I have made hundreds of color slides. They are slides of works at some twelve museums and galleries (including Smithsonian Institution), and twenty sets of art works by individual artists.

Much of the material has been presented at the annual conference of the National Conference of Artists, and at three African-American Cultural Institutes sponsored by the National Endowment for the Humanities.

Pre-tests were given to teachers of the cultural institutes and to three groups of Upward Bound students. In all cases there was a ninety-seven percent increase in knowledge gained as a result of the illustrated color slide presentations and discussions.

The information has improved interracial appreciation and has aided in multiethnic education. Needed information has been added to the new course at Morehead State University in Afro-American Art. Two television programs have been made by WKYT-TV in Lexington, using some of the material in recognition of National African-American History Week.

SCIENCES AND MATHEMATICS

**A SURVEY OF THE NEEDS IN THE SCIENCES AND MATHEMATICS (K-12)
IN THE APPALACHIAN REGION OF EASTERN KENTUCKY**

By
William R. Falls
Head and Professor
Department of Science Education

and

By
John G. Fryman
Assistant Professor
Department of Mathematics

A survey of the needs in the natural sciences and mathematics for grades K through 12 was conducted. Both teacher needs and student needs were established through the development and administration of a questionnaire to randomly selected elementary and secondary teachers from 37 counties of eastern Kentucky.

Most secondary science and mathematics teachers expressed concern over insufficient formal training in techniques pertinent to science and mathematics teaching. Students and teachers noted the lack of sufficient funds to provide adequate audio-visual aids, demonstration equipment, and library materials.

Over half of the elementary teachers that responded have completed only minimum certification requirements in mathematics and science while numerous others lack total certification. Many feel that in-service workshops are improperly planned if their function is to increase teaching abilities.

The study supports the need for changes in certification requirements for secondary science and mathematics teachers as well as for elementary teachers; concerns currently under consideration by the State Department of Teacher Certification.

**PINE SEEDLINGS AS BIOLOGICAL CHECK ON
NUCLEAR WASTE DISPOSAL**

By
Margaret B. Heaslip
Professor
Department of Biology

Nuclear wastes are being deposited on the Rowan-Fleming County line at Maxey Flats by Nuclear Engineering, Inc. Pine species are desirable indicators of low level radiation stress for they are more radiosensitive than other woody species. The major objective of the research is to biologically test the effectiveness of the burial techniques being employed. Random plantings of 216 seedlings of three pine species were planted over three burial pits. Dosimeters were attached to stem apex, base of stem, and two-inch deep roots of eleven plants in each three burial areas and a control planting on my farm for 71 days during the 1973 growing season. Exposure doses in m rem per day ranged from .410-.891 over burial pits, .342-.523 in control planting, and .330-.411 for dosimeters stored in the laboratory. The dose levels dropped from what they had been over the burial pits in past years for all pits have been filled and new burials are no longer occurring in this section. The irradiation doses are within the safe levels set for such an area. The pine seedlings show no radiation damage to date.

SOCIAL SCIENCES

SPORE GERMINATION AND SURVIVAL IN SOIL OF MICROFLORA COLONIZING PEANUT FRUITS AND PLANT ROOTS

By
Ted Pass, II
Assistant Professor
Department of Biology

The objectives of the study were to determine the carbon and nitrogen, pH and temperature requirements for spore germination by *Aspergillus flavus* and other fungi colonizing peanut fruits, as well as study the influence of rye (cover crop) on the survival of the propagules of *Aspergillus flavus* and other pod colonizing fungi in field soils.

Maximum germination by *Aspergillus flavus* conidia occurred at 35 C in two axenic nutritional systems. However, the rate of germination in glucose plus amino acid nitrogen, supplied as peptone, was much more rapid than in glucose plus ammonium nitrogen. Percentage germination at reduced temperature (25 C) in glucose plus peptone was more than double that in glucose plus ammonium, even though the germination time used was shorter. Using both citrate-phosphate and phosphate buffers, a broad pH optimum range (pH 3.0-7.5) for fermentation was observed in glucose plus peptone, while a narrower optimum range (pH 4.5-6.0) was observed in glucose plus ammonium. Low soil temperature and high soil pH may restrict *Aspergillus flavus* conidial germination less in soil environments where amino acid nitrogen is the principal nitrogen source. The high temperature optimum for fermentation may contribute, in part, to the relatively low populations of this fungus in peanut field soils.

The study involving rye, as a cover crop, has shown promise in that a significant increase in the population of *Aspergillus flavus* was noted over a 6-month period. This then indicates that with a higher soil population of *Aspergillus flavus* the frequency in which peanut pods come in contact with the propagules of *Aspergillus flavus*, would also possibly increase. Thus accounting for a large percentage of the peanuts pods becoming colonized and hence possessing the carcinogens produced by this fungus.

This phase of the study, using rye or another suitable covercrop, should be repeated with emphasis on corn and soybeans instead of peanuts since both *Aspergillus flavus* and its toxins have been isolated from corn grown in eastern and western Kentucky.

THE CHILDREN OF DECEASED AND DISABLED COAL MINERS IN EASTERN KENTUCKY

By
Henry H.B. Chang
Assistant Professor
Department of Sociology

The present study was concerned with implications of the oppressive conditions of coal mining for the miners' children. Questionnaires were distributed to about 250 miners' children and 750 children of non-mining background. A comparison of some social psychological characteristics was made among the three groups: children of deceased and disabled coal miners; children of fully-employed miners, and children from non-mining background.

Findings of the present study showed that there was no significant difference between children of deceased and disabled miners and children of fully-employed miners. Some significant differences

were found between children of coal miners and children of non-miners. More of the miners' families were found to be father-centered than those of non-miners. Also, the miners' children were found to be less religious, more authoritarian, and more pragmatic in their career orientation.

SOME FINDINGS CONCERNING THE SELF-CONCEPT OF BLACK AMERICANS

By
Henry H.B. Chang
Assistant Professor
Department of Sociology

Traditionally, Black Americans were thought to possess an inferior self-concept. This traditional view was challenged by the present study, which found that Black students had a more favorable self-concept than Caucasian students. The favorable self-concept among Black students was thought to reflect significant improvements in the Black social situation since World War II. In addition, this study also found that the family environment constituted a significant determinant of one's self-concept. On the other hand, a student's socioeconomic background and his school achievement were found not associated with his self-concept.

HUMANITIES AND TECHNOLOGY IN THE UNIVERSITY CURRICULUM

By
John J. Hanrahan
Professor
Department of History

The author studied during the summer of 1974 at the University of California, Los Angeles, under a National Endowment for the Humanities grant. The subject was "Humanities, Technology, and Values in 20th Century America." A faculty research grant enabled the author to broaden the inquiry into an investigation of the response of higher education curricula to the effects of technological change on the economy, on public policy, and on the character of society. Are students being prepared to understand the large-scale consequences of ongoing social, political, economic, and technological trends? What influence should the experience of other universities in meeting this problem have upon the curriculum of this university?

There has been a dawning realization that rapid scientific and technological progress is producing changes in every facet of life. These changes are affecting human values; choices now, as a result of this progress, have to be made by individuals and by governments in situations that did not exist even a quarter century ago. Our new scientifically based technology has grave implications for us as free individuals, for the future of the human race, and for the future of democracy as we know it in America.

The obligation of the university is to make these forces comprehensible to its students. But these problems, reducing pollution from automobiles, evaluating the desirability of supersonic transport planes, or cleaning up Lake Erie, for example, are complex problems whose understanding requires contributions from a variety of natural and social sciences in order to understand the physical, biological, social, economic, or political consequences of proposed actions. In other words, these are problems that cannot be effectively pursued within the confines of any single discipline. Course development in major universities, this study is making clear, is responding to this truism.

Faculties are joining from Art, English, Engineering, History, and so forth, in offering courses that reflect the technological age in which we live. For example, "Fiction and the Technological Vision," "Sculpture and Technology," "Electronic Music." At one university, the departments of Psychology and Chemical Engineering have teamed to offer "Futuristics," while History, Classics, and Economics offer "Humanistic Perspectives in a Technological Society." Continuing investigation of this curriculum movement and presentation of the findings should have importance to this university as it seeks to develop its programs in technology without neglect of the humanities.

OPPOSITION TO SLAVERY IN THE UPPER SOUTH

By
Victor B. Howard
Professor of History
Department of History

The objective of the research was to examine the opposition to slavery in the Upper South by focusing attention primarily on Kentucky during the period from 1848 to 1850 when the people of the "Blue-Grass" state were undertaking a revision of the Kentucky Constitution. The general historian is under the assumption that there was no opposition to slavery in the South or that the opposition represented an insignificant minority. There is a need to expel this misconception. The South was not a monolith and the opponents of slavery in the South counted for more than their numerical totals. The Upper South contained a surprisingly large number of native nonconformists on the slavery question who were recruited chiefly from the professional classes.

The research resulted in several articles which are scheduled to appear in journals during the next year. "The Presbyterians and the Slavery Controversy in Kentucky in 1849" will appear in *The Register of Kentucky History*, July, 1975. "Robert J. Breckinridge and the Emancipation Movement in Kentucky in 1849" is scheduled to appear in the *Journal of Presbyterian History* in 1975. "James Madison Pendleton: A Southern Emancipationist" will appear in the *Baptist Heritage and History* in 1975.

SLAVERY AND FREEDOM: THE NEGRO IN KENTUCKY 1865-1882

By
Victor B. Howard
Professor of History
Department of History

The objective of the study was to develop an account of the effects of the Civil War on Negroes in Kentucky during the Reconstruction Period. Equally important was an examination of the extent of influence of the blacks in Kentucky in shaping the course of events in the state after the War.

While the South was under the control of Radical Reconstruction, the border states were free to experiment to find the degree to which the states would be permitted to have a free hand in establishing a new pattern of social relations to replace the mores and social controls of the antebellum slavery society. Kentucky played a significant part in creating the new patterns of race relations that were adopted by the South by the end of the nineteenth century.

The research resulted in the following articles and papers:

"The Kentucky Press and the Negro Testimony Controversy, 1866-1872," *The Register of the Kentucky Historical Society*, January, 1973.

"The Black Testimony Controversy in Kentucky, 1866-1872," *The Journal of Negro History*, April, 1973.

"The Kentucky Press and the Black Suffrage Controversy, 1865-1872," *The Filson Club Historical Quarterly*, July, 1973.

"Negro Politics and the Suffrage Question in Kentucky, 1866-1872," *Register of the Kentucky Historical Society*, April, 1974.

"The Breckinridge Family and the Black Testimony Controversy in Kentucky," *The Filson Club History Quarterly*, January, 1975.

"The Negro Testimony Controversy in Kentucky, 1866-1872," *Paper Read before the Negro History Convention, Cincinnati*, October 19, 1972.

"Blueprint for a Doctrine of Separate But Equal: *Negro Education in Kentucky, 1866-1883*," organized but not yet submitted for publication.

URBAN RIVALRY

By
Stuart Seely Sprague
Associate Professor
Department of History

This study centered upon (1) the development of new towns during the Era of Good Feelings, roughly 1814-1820 and (2) the rivalry of Louisville and Cincinnati 1815-1840. The former has resulted in the publication of two articles "Alabama Town Production During the Era of Good Feelings," *Alabama Historical Quarterly* Spring, 1974, and "Town Making in the Era of Good Feelings: Kentucky 1814-1820," *The Register of the Kentucky Historical Society*, October, 1974. Though generalizations are difficult in historical research where nuances are important, it can be said that the urban aspirations of the South were greater than is customarily credited to the region. John W. Reps' authoritative volume on city planning entitled *The Making of Urban America* neglects the Alabama and Kentucky experiences. The articles break new ground documenting a feature of the Antebellum South that has received little attention. Urban rivalry between Cincinnati and Louisville through 1830 was covered to some extent in Richard C. Wade's *The Urban Frontier*. The study of the Louisville and Portland Canal "The Canal at the Falls of the Ohio and the Three Cornered Rivalry," *The Register of the Kentucky Historical Society*, January, 1974, details the struggle among three states to build the canal. Another study, "Kentucky and the Cincinnati to Charleston Railroad" is scheduled for publication next April. It is the untold story of the Kentucky aspects of a well-known rail project whose aim was to connect Charleston with Cincinnati. Cincinnati, Covington, Maysville, Lexington and Louisville all felt their city's future would be influenced by the railroad and acted accordingly. The jealous rivalry of these cities was one of the factors that caused the project to fail.

TOWNS OF COAL AND IRON: APPALACHIA, 1889-1893

By
Stuart Seely Sprague
Associate Professor
Department of History

During the short time, 1889-1893, well over one hundred industrial towns were platted in the Southern Appalachian area with a view to mining coal and iron. Many were "paper" towns, the primary purpose of which was land speculation on a large scale. Extravagant lithographs, extensive advertising and a variety of advertising gimmicks were used to attract buyers. More than thirty new towns were located in Virginia alone. The Depression of 1893, coupled with earlier failures in some of the new towns, produced a bear market for such real estate ventures. In addition, the predicted ever increasing need for iron and steel was not realized. The factories that were built increased the supply to a greater extent than the demand warranted and the price of steel decreased.

An article "Investing in Appalachian Virginia, The Great Valley Boon of 1889-1893" has been accepted for publication by *Virginia Cavalcade* (probably the Winter 1974-1975 issue). Lithographs, maps, front covers from the booster press, promotional pamphlets are among the illustrative matter used. One of the more interesting effects of this article should be that it pushes back almost two decades the traditional date for the "discovery" of Appalachia by outsiders.