A Selected Annotated Bibliography on Economic and Social Development in Missouri: 1960-67
A SELECTED ANNOTATED BIBLIOGRAPHY ON ECONOMIC AND SOCIAL DEVELOPMENT IN MISSOURI: 1960-67

Professional Staff

Rex R. Campbell — Associate Professor of Rural Sociology
Department of Rural Sociology

Betty Hymowech — Graduate Assistant
Department of Rural Sociology

Cynthia Krueger — Staff Sociologist
Center of Community and Metropolitan Studies
(St. Louis)

Donald D. Osburn — Post Doctoral Fellow
Department of Agricultural Economics

Earl J. Reeves — Associate Director
Center of Community and Metropolitan Studies
(St. Louis)

William N. Ross — Instructor
Department of Agricultural Economics

Arthur L. Wright — Graduate Assistant
Department of Agricultural Economics

Melvin G. Blase — Associate Professor of Agricultural Economics
and Project Director
Department of Agricultural Economics
A Selected Annotated Bibliography on

Economic and Social Development

in Missouri: 1960-67

Preface

The research for this publication was initiated by the University of Missouri as part of a consortium that included the University of Oklahoma, Oklahoma State University, and the University of Arkansas. The consortium was to develop a bibliography and an evaluation of publications concerning economic development in the Ozark region for the Economic Development Administration of the U.S. Department of Commerce. This work was done in preparation for activities of the Ozark Regional Development Commission. The initial report encompassed only those publications applicable to the 44 southern Missouri counties designated as part of the Ozark Development Region. Selected references from that publication have been utilized in this manuscript. The initial literature review has been supplemented to up-date it, and expand the coverage to the entire state of Missouri. This publication is an attempt to present the most current and relevant material concerning economic development in Missouri in summary form.

Section I deals with industrial development and location. It covers development organizations, location of industrial development, and studies of industrial impact. Section II reviews the fastest growing industry in the state—recreation and tourism. An important part of the recreation section concerns the need and plans for future growth. The third section is about Missouri’s largest industry—agriculture—with emphasis on organization and management, agronomy, livestock production, and conservation.

1 Authority has been obtained from the U.S. Department of Commerce to utilize part of this material. In accordance with U.S. government regulations, note should be made of the fact that these data are results of tax-supported research and as such are not copyrightable. They may be freely reprinted with the customary crediting of source. None of the findings, conclusions, or recommendations are necessarily endorsed by the U.S. government.
Forestry is the topic of Section IV. The major forest areas of the state are outlined along with studies on forest management, production, and utilization. Section V focuses on Missouri’s natural resources and their utilization. This section centers on water and minerals, plus a brief review of fuel and power literature.

The focus of the bibliography shifts in Sections VI and VII to the human element in economic growth and social betterment. Occupational, economic, and other population characteristics are discussed in Section VI, while Section VII deals with the education and training of Missouri citizens. Among the most important areas covered in Section VIII are such public facilities and services as transportation, communication, health facilities, churches, and welfare programs.

The last two sections deal with the problems and programs of governmental units. In Section IX publications concerning the organization and operation of state and local government are reviewed and the official government programs are listed for all three levels of organization—federal, state, and local. Section X completes the bibliography with a review of pertinent publications on public finance. Problems and methods of taxation are covered along with programs designed to aid in financing industrial development and public facilities.

The citations covered in this publication were published between 1960 and 1967. They have been annotated briefly to suggest the nature of their contents. The reader is urged to obtain copies of the publications cited if the annotations suggest they are worthy of interest.

This literature review has resulted in two publications. This one is a selected list of publications for individuals concerned with regional economic development planning in Missouri. The companion publication, a University of Missouri Agricultural Experiment Station Research Bulletin No. 933 entitled “A Bibliography on Economic and Social Development in Missouri, 1960-67,” is a more comprehensive bibliography of material relevant to economic development in Missouri. Recognition is made of the fact that judgment has been used by the authors in determining which publications should be included in the various sections in both bibliographies. For example, the Federal Census publications have not been included in this selected bibliography but have been cited in the more comprehensive companion publication. While differences of opinion might exist as to which publications to include or omit, the consensus of the economists,
sociologists and political scientist preparing this manuscript has resulted in citations that follow.

In addition to those directly involved in the preparation of this manuscript, there were others who indirectly contributed to it. Specifically, the initial work done by Drs. Lloyd Bender and Max Jorden is recognized. In addition, colleagues in numerous departments of the University who reviewed sections of the manuscript are deserving of this expression of appreciation. Finally, the secretaries who aided in the preparation of the manuscript, Mrs. Virginia Clater, Mrs. Karen Hoff, and Mrs. Rozanne Van Ausdle, were most helpful in the numerous typings required of the manuscript. While sincere appreciation is expressed to all the above individuals, responsibility for the accuracy and content of the manuscript is assumed by those of us who have assumed professional responsibility for it.

—Melvin G. Blase

Project Director
# Table of Contents

## I Industrial Development & Location
- Development Organization, Feasibility Study ................. 8
- Location of Industrial Development ....................... 17
- Impact of Industrial Development ......................... 22
- Development Ref. & Statistics ......................... 26

## II Recreation & Tourism
- Tourism ................................................. 28
- Water-Based Recreation ................................ 32
- Recreation Planning ................................... 33
- Statistics & Miscellaneous ............................. 37

## III Agriculture
- Organization, Management & Marketing .................. 39
- Agronomy .................................................. 45
- Livestock & Poultry Production .......................... 49
- Conservation & Irrigation ............................... 51

## IV Forestry & Forestry Products
- Forest Areas ........................................... 56
- Forest Management .................................... 61
- Production & Utilization ................................ 62
- Statistics & Miscellaneous ............................. 66

## V Natural Resources
- Fuel & Power .......................................... 69
- Water ..................................................... 72
- Mineral .................................................. 73
- Statistics & Miscellaneous ............................. 75

## VI Human Resources
- Occupation Characteristics ............................. 77
- Economic Characteristics & Traits of Business Management ........ 77
- Other Population Characteristics ....................... 79
- Statistics & Miscellaneous ............................. 81

## VII Education & Vocational Training
- Elementary, Secondary Education ....................... 84
- Vocational Training .................................... 88
- Higher Education ....................................... 89
- Adult Education ........................................ 90
- Statistics & Miscellaneous ............................. 92

## VIII Community Facilities & Services
- Churches .................................................. 96
- Health Facilities ....................................... 96
- Welfare Programs ....................................... 99
- Transportation & Communication ...................... 100
- Statistics & Miscellaneous ............................. 102

## IX Gov't Programs, Plans, Services
- Federal .................................................... 105
- State ..................................................... 108
- Local ..................................................... 112

## X Finance & Taxation
- Taxation .................................................. 120
- Financing Ind’l Development ............................. 123
- Financing Public Facilities ............................. 129
Section I

Industrial Development and Location
The purpose of this industrial feasibility study considers the opportunity for wooden pallet manufacturing in the state of Missouri. The study provides: (1) general background information; (2) information on the existing industry in the state of Missouri; and (3) information and factors involved in the operation of a hypothetical wooden pallet manufacturing plant utilizing the labor and raw materials readily available in any one of several possible locations within the state.

Findings revealed that there were 48 pallet producers located primarily in the southern and southwestern areas of the state of Missouri. These manufacturers produced approximately 69 million board feet of pallets (one pallet equals 25 board feet) in 1966, while the pallet users within the state purchased an estimated 75 million board feet during the same period. In all, the prospective growth of the industry, the excellent market potential in the area, the adequate supply of lumber and labor, and the relatively low initial investment costs suggests that new wooden pallet plants would be successful in Missouri.


This report presents a description of recent changes in beef slaughtering—nationally, by region, and within Missouri. Important aspects included are changes in location, type of plant, type of firm, and changes occurring in the organization and operation of the industry. Also presented is a description of two recently established beef slaughtering plants (one with a 70 head/hour slaughtering capacity and the other 150 head/hour). This description includes plant requirements in terms of capital, labor, and raw materials including cattle. In addition, the report outlines the marketing and distribution practices used by management in these plants.

On the basis of data presented, areas within Missouri are identified as having potential for additional beef slaughtering plants. These areas are identified on the basis of assumed plant capacity and existing plants. Although the report does not contain the detailed information necessary for choosing one area over the other, it does reveal that the northwestern area of Missouri has the greatest potential for an additional plant. In other areas new plants will need to be constructed to replace old plants within the next few years.

Reasons are given for organization of the Mid-Missouri Development Council and some of the Council's activities. The Council undertook an industrial survey to analyze the area's assets and to develop help in obtaining new industry. This includes sources of jobs from non-manufacturing activity which is important because of the declining number of job opportunities due largely to mechanization of agriculture.


The two principal intents of this study are as follows: first, to discover the role of Missouri soybean processors and producers in the industry; and second, to present data that would provide an indication warranting the further development of the processing industry in the state of Missouri. Included are data and analyses on the concentration of processing, the "flow" and transportation of soybeans to processors, the production/processing ratios of leading processing states, and the utilization of soybeans in recent years.

Findings of this study indicate that acquisition costs represent over one-fourth of the operating expenditures for a soybean processing plant. These costs can be reduced by locating near areas where production greatly exceeds utilization. Data shows that processors in Missouri are able to acquire beans with an average acquisition cost below that of processors in the seven other leading soybean producing states. Missouri also is close to major markets for soybean products including livestock feeding and manufacture.


This report examines the chemical industry on a national and state basis and finds Missouri to be well above the national average in terms of chemical industry employment. With six major companies headquartered in the state, there is a broad base for further expansion, particularly for the medium to small chemical companies who can utilize Missouri's raw materials. Suggested areas for further study are tires, soap, and plastics.


After studying the structure of the electrical industry and the statistical summary for Missouri, the report concludes that it would be in the best interest of the state to expand upon the present electrical industry as opposed to trying to build a new sector. The electrical industry of Missouri centers around Westing-
house and Bendex of Kansas City and McDonnell of St. Louis. An exception is cited as the household appliance industry where Missouri might have locational and resource advantages over other areas.


This report examines the mineral based industries of Missouri and the possibilities for further growth. Non-metallic minerals included in the study included fluo-apatite; swelling bentonite; alumina; lime refractories; silica; and saline groundwater. Metallic minerals, other than lead and iron ore were found to offer little economic opportunity under present technology. The report examines the possibilities of an integrated steel mill, and concludes that the estimated return on investment (4.8%) would not be especially attractive under present conditions.


Statistics reveal that Missouri is a net importer of mobile homes. Apparently, the primary reason Missouri has not attracted new mobile home manufacturers is the Missouri law limiting units to 8 feet in width and 50 feet in length. The most common size mobile homes currently produced are 10 feet wide and 60 feet long. The state does grant permits for transport of these size homes, but the extra paper work is considered a handicap. Moreover, 12 foot wide units are becoming increasingly popular, and these units could not be moved on Missouri highways. The report concludes that the Missouri market would justify further feasibility study if the law were changed to permit transport of units 12 feet in width by 60 feet in length.


This study design sets forth a total program for a planning program and budgeting system for a comprehensive development plan for the seven-county Kansas City metropolitan region.

It includes a complete description of the program and the organizational structure required to carry out the planning process; but a specific final plan is not suggested.

Those items of work necessary for analysis to arrive at conclusions relative to the growth and development of the metropolitan region are described in detail and their activities listed to illustrate the content of work with regard to each work item.

Based upon this analysis of work to be undertaken, a schedule of work flow
and time allotments has been completed as well as anticipated cost for each work item.

The planning process from January, 1967, to October, 1972, will require a total of $2,582,649. This time period and estimated cost figure represent a correlation of the estimated man-months and dollars required to arrive at a place where a completed comprehensive development plan can be phased into a coordinated, cooperative, and continuing planning process.

The five major sections of the publications deal with 1) the planning, programming, and budgeting system, 2) interim planning and technical procedures, 3) inventories, analyses, projections, and basic plan preparations, 4) plan development and systems testing, 5) implementation of the plans.


This report deals with the more than 300 industrial development organizations in Missouri. Virtually all communities are represented or organized to assist industrial expansion or new locations. In 1966, 168 Missouri manufacturers expanded their facilities. This activity represented more than $77 million in new investments and created employment for 15,014 additional workers. The additional employment generated $91,056,090 in new wages within the state.

In addition to the expansion of existing industry, 134 new manufacturing plants were located in the state in 1966. These new manufacturers invested more than $63,900,000 and provided employment for 10,583 new workers creating $53,146,000 in new wages. Many of the local industrial development organizations were able to assist in the 1966 industrial activity.

This book lists industrial organizations, along with banks, transportation companies, utilities, and industrial realtors that are ready and capable to provide industrial assistance.


This publication is designed to aid purchasing agents and others seeking new sources of supply, to stimulate the marketing of Missouri products, and to assist firms interested in locating in Missouri by familiarizing them with Missouri products.

Firms listed are limited to the following definition: "A manufacturer shall be considered any establishment engaged in the mechanical or chemical transformation of inorganic substances into new products or an establishment engaged in assembling component parts or non-fixed manufactured products."

The directory classifies manufactured products according to *The 1957 Standard Industrial Classification Manual*, prepared by the Technical Committee on Industrial Classification, Office of Statistical Standards of the Bureau of the Bud-
get, Executive Office of the President. Classification is made on a four-digit basis, and one establishment may be listed under more than one standard industrial classification (SIC) number if it manufactures more than one major product.

Section 1 of the directory is an alphabetical listing of manufacturers with street address, city, zip code, and employment code included. Section 2 is a geographic listing arranged first by alphabetizing of counties and then alphabetizing of cities within the counties. Manufacturers within a city are then in alphabetical order. A town-county index, along with a county outline map, is included to facilitate location of plants. Also, a standard industrial classification index is included to facilitate explanation of the four-digit numbers which appear under the address of each company in the section. The page numbers appearing after the description for each four digit number allow a reader to locate all manufacturers of the product in the Product Section. Section 3 is a product listing of Missouri manufacturers. Manufacturers' directories are arranged geographically according to county and city. An alphabetical product index is included to further aid in finding manufacturers of special products.


This report examines the corrugated container market in Missouri during the 1962 year. The report is divided into two parts: (1) corrugated containers in the United States: 1962; and (2) market potential for corrugated containers in the state of Missouri. Results indicated that the state has 25 container plants which would offer strong competition for a new producer. Therefore, expansion of existing plants would probably handle any increase in demand.


The purpose of this study was to determine if market opportunities exist within a six-state area which would enable expansion of plastic bottle manufacturing within Missouri. The study was designed to determine the size of the plastic bottle market in this area and the portion of this market not being served by local manufacturers. Highlights of the analysis include the following:

1. The potential market area for Missouri manufacturers was determined to be Missouri and the five states which border Missouri west of the Mississippi River. A large number of plants are located in Illinois, and Missouri manufacturers might find it difficult to compete satisfactorily with those plants due to transportation costs involved.

2. Fifty-eight companies located within the six-state market area reported plastic bottle consumption in 1964. Five additional firms said they began purchasing bottles in 1965.

3. Nearly 40 percent of the companies reporting said they purchased bottles...
from suppliers located outside their home state and Missouri during 1964. More than 25 million plastic bottles were reported purchased from these suppliers, or 28 percent of the total consumption reported.

4. Eighteen companies using plastic bottles during 1964 reported their major suppliers were located entirely outside the six-state market area. Most of these suppliers were located in Illinois, Indiana, Pennsylvania, New Jersey, and Connecticut.

5. Twenty-seven manufacturers said they presently manufactured products which could be packaged in plastic bottles. These firms estimated that nearly 5 million bottles would be required annually to package these products.

6. Authorities estimate that a market ranging from 2.5 to 6 million bottles a year would be necessary for each blow molding machine. A new plant would need approximately 5 million dollars worth of business per year, or approximately a 30 million bottle market.

7. Analysis of the study data revealed that beyond the present market an additional 32.6 million plastic bottles could have been marketed in 1965. It is noted that this is a conservative estimate since a few of the larger users in the area could not provide figures on plastic bottle usage. Thus the study concludes that Missouri’s location with respect to transportation, major milk markets, and other potential markets would be ideal from which to serve the expanding industry.


This is an industrial feasibility study designed to provide (1) general information on the industry’s background; (2) explore certain markets and input characteristics as they relate to Missouri; and (3) examine a hypothetical Missouri furniture manufacturing plant utilizing the resource potentials found in the study.

In general the analysis of the furniture industry in Missouri reveals that the industry does not meet the sales demand of the state. The state offers an estimated $14 million market for wood household furniture and is in the center of a 10-state midwest market with annual sales estimated to be in excess of $783 million. In comparison to a furniture manufacturer located in the New England area, a Missouri based industry could make substantial savings in transportation costs in serving the vast midwest furniture market.

The availability of workers in the state was found to be good, but acquisition of a sufficient number of skilled furniture craftsmen would be difficult in rural areas. The state has adequate raw materials, being the nation’s leading producer of walnut logs. Other types of hardwoods are readily available. In addition the state has numerous manufacturers of furniture parts which would be of great benefit for finished goods plants. A special survey conducted by the Missouri Conservation Commission reveals some 53 wood producers in Missouri who would be able to and willing to supply suitable lumber to furniture manufacturers. These suppliers are listed along with details of their products.

This report focuses on a step-by-step explanation of how a city can establish an industrial development organization. This part has appropriate legal papers and detailed descriptions of the functions of the development organization’s necessary subcommittees (legal, financial, sites and buildings, publicity, and committee of the whole). It also discusses the continuing functions of each and gives practical pointers on how they can fulfill their part of the program.


This report continues the step-by-step explanation begun in *Part I: The Organization Program* by presenting an action program. It explains in detail how to conduct an economic survey; how to work with existing industry; how to outline the cities’ planning and zoning needs; and how to begin an industrial promotion program and handle prospects. The report ends with a discussion of arguments sometimes heard against local industrial development.


The prime criterion used in this study was the number of hogs produced in concentrated areas. The amount of competition and transportation facilities were evaluated. Suggested possible locations based on these limited criteria were Hannibal, Lexington, Marshall, Maysville, Mexico, Sedalia, Vandalia, and Warrensburg. The study makes no recommendations as to which area might possess the greatest advantages.


The purposes of this industry feasibility study were threefold: (1) to examine the market potential for electronic components; (2) to determine Missouri’s share of the electronic component market; and (3) to determine the factors that could be employed to improve Missouri’s prospects of increasing its share of the market.

Research showed Missouri to be without a large electronic components industry, and in conjunction, without a large electronic component using industry.
It lists a review of all electronic firms located in Missouri, revealing that the recent location of plants to produce consumer oriented electronic products may give the industry a firm basis in the future.


This study was conducted in cooperation with the Economic Research Service, U.S. Department of Agriculture, as a result of a request for technical assistance made by the Missouri Commerce and Industrial Development Commission, Jefferson City. The study had the following objectives (1) the determination of the economic feasibility of commercial fruit and vegetable production for processing in the seven county Delta area of Southeast Missouri; (2) to ascertain the economic feasibility of establishing one or more canning or freezing plants to process fruits and vegetables grown commercially in the Missouri Delta area.

Information relevant to costs and production feasibility was obtained from growers, processors, horticultural specialists of the University of Missouri. County agents in the Missouri Delta and adjoining areas of Arkansas, Tennessee, and Kentucky, in addition to published research reports were sources of information. After the feasible crops were determined, block budgeting and linear programming techniques were used in estimating the size of firms, the costs, and profitability of the needed plants.

The production of green beans, leafy greens (spinach, mustard, kale, collards, and turnips), lima beans, and southern peas would be practical on many farms. Fruits and other vegetable crops were eliminated for various reasons. A sufficient quantity of the raw products necessary to support a modern low cost processing plant would seem assured.

An expanded research and extension program in the area could increase yields above the conservative levels used in this analysis. This would contribute to the profitability of vegetable production and expand the potential quantity of raw products to meet the requirements of additional plants.

The feasibility of operating a freezing or canning plant was studied. The annual output of the freezing plant would be 14,475,000 pounds while the output of the canning plant would be 966,287 case equivalents of 24 number 303 cans. Capital requirements for the freezing plant are $1,530,872 for buildings and equipment and $1,165,000 for operating needs. The canning plant would require $693,148 for buildings and equipment and $855,000 for operating capital.

An analysis of costs and revenues for each plant indicates that the net profit after taxes would be $126,943 for the freezing plant and $56,846 for the canning plant. The freezing plant would employ approximately 62 seasonal laborers and 33 full-time employees, including management, with an annual payroll of $258,990. The canning plant would employ 88 seasonal laborers and 18 full-time employees,
including management, with an annual payroll of $244,398. In man-year equivalents, the freezing and canning plants would employ 72 and 70 workers, respectively, in labor and management positions.

Production of the necessary vegetable raw materials would increase gross farm income by $595,000 and net farm income by $75,000. Seasonal day laborers currently underemployed on farms in the area would be able to work an additional 102,000 hours in the production of vegetable crops. This would increase their income $61,200 annually.

The results of this study show that the production and processing of vegetables are economically feasible. However, prospective processing plant investors should carefully reexamine all factors considered in this report before investing. Management capable of handling the problems of market entry, raw product procurement, and efficient plant operation are essential to the success of this investment.

Reardon, Paul A., *The Missouri Market For Sulfuric Acid: Opportunities For Growth.* Study by the University of Missouri, School of Business and Public Administration in cooperation with the Missouri Division of Commerce and Industrial Development. Jefferson City, Missouri: April, 1966. 126 pp.

The purpose of this study was to determine the ratio of the quantity of sulfuric acid supplied to that demanded in the Missouri area. A second purpose was to outline and characterize areas of industrial activity in which a local demand for acid should be created. Such industries were selected on the following bases: (1) they used significant quantities of sulfuric acid in their production process; (2) they had experienced recent growth and future growth was anticipated; and (3) the location of plants in Missouri was economically feasible.

Missouri was found to be an importer of sulfuric acid. The two sulfuric acid plants in Missouri were "captive," with practically all of their output being used at the plant location or at another location of the same firm. However, recent developments in lead mining and smelting in Missouri have enhanced the feasibility of producing quantities of acid in the state. The State Division of Geological Survey and Water Resources reports that St. Joseph Lead Company will construct a 100,000-ton-per-year sulfuric acid plant at Herculaneum, Missouri. American Metal Climax, Incorporated and Homestake Mining Company will produce from 50,000 to 70,000 tons of sulfuric acid annually at their new lead mine, mill and smelter complex, in southeast Missouri. It is also feasible for American Smelting and Refining Company to produce sulfuric acid at their new lead smelter at Glover, Missouri.

Based on planned production and potential for further expansion, Missouri's outlook for growth in the chemical industry is favorable. Moving from a deficit production position to that of surplus, relative to local needs, creates excellent opportunities for producers of hydrofluoric acid, pesticides (DDT), chloral, and synthetic phenal. Also possible users of sulfuric acid with favorable market out-
lets would include producers of ammonium sulfate, detergents and hydrochloric (nuritate) acid.


The purpose of this booklet is to highlight some opportunities for small wood industries suited to low-income counties in or adjacent to forests. To make forest land contribute to the community economy, scientific forest management must be applied and a market for woodland products provided.

**LOCATION OF INDUSTRIAL DEVELOPMENT**


The material in this book is based on statistics accumulated by the Bureau of Census over the last three decades. The purpose is to describe in detail as much as possible the locational changes from the point of view of specific industries and areas.

The main study covers the years 1929 through 1954 with a supplemental analysis of the period 1947-1954. The basic area unit of analysis is the state; location of manufacturing activity is described both in terms of value at or by manufacturer and of total employment. The study of the redistribution of industry is based on a comparison of actual figures per each of the states in 1954 with hypothetical figures showing what the level of manufacturing would have been if the states had grown at the same rate as the nation between 1929 and 1954.

The most significant location trend since 1929 has been a rapid rate of growth of manufacturing in the Northeast. Regional differences in supplies of unskilled labor have been important for the low wage intensive industries, such as textiles and apparels, which have tended to shift from the Northeast and East North Central to the South Atlantic and East South Central. Furniture, footwear, and some other high wage industries, such as tires and tubes, also have shown a pattern of location change oriented to labor. Raw materials have been of major importance in the growth of chemicals on the Gulf Coast. In terms of number of jobs available, the most important redistributions were in aircraft, textiles, apparel, and chemicals. Industry mobility tends to be greater for low wage industries than for high wage ones and greater for fast growing than for slow growing industries. Concentration of ownership apparently offers no barrier to industrial mobility. No support was found for the hypothesis of greater mobility in light industry as compared with heavy industry. As a result of industrial redistribution, manufacturing employment per capita was more evenly distributed in 1954 than
in 1929. There was a positive correlation between the rate of growth of an industry and a tendency to become less concentrated geographically. Most states became less dependent on a single industry and tended to have industrial structures with fewer extremes in either a favorable or unfavorable direction. Despite these changes the Northeast and East North Central regions continued to dominate U.S. manufacturing in 1954, although not to the same extent as they did in 1929.


This study of new manufacturing establishments that have located in Missouri during the period 1955-60 was undertaken to assist communities in the rural sections of the state in their programs to obtain additional manufacturing employment.

The thesis of the study is that the rural areas are growing today not because of national factor (or comparative) advantages that have just been realized, but rather as the result of overall growth. This growth is a result of the breaking-up of a national market into many sub-markets. Most of the development in the rural counties of Missouri is because of a local advantage which has become clear as a result of new developments (such as the increased use of highway transport). Thus the development of the national market into a size large enough to support a branch in an area has aided in the development of the rural counties.


This article shows what type of manufacturing firms have chosen rural locations. In the early 1950's urban area locations were increasing at a faster rate than in rural counties. In the later years, however, the rate of location growth in the rural counties has been faster than in the urban counties. In the future rural locations are likely to continue in greater numbers.

Food and kindred product manufacturers are definitely prospects for rural areas. All sizes and types of firms processing foods have chosen rural over urban locations by a 3 to 1 ratio. The rural areas have had most success in attracting food firms employing under 25 people.

Metal fabrication in Missouri is mostly concentrated in the metropolitan areas. These firms accounted for 11 percent of the total located in Missouri during the period studied.

Between 58 and 60 communities in rural areas have been matching urban areas plant for plant in the number of new plants located in each area.

The study found that the food and kindred product industries, the apparel and finished product industry, the lumber and wood products industry, and the
leather and leather products industry have shown strong preferences for rural areas.

There are also indications that the textile mill products, petroleum refinery, the professional, scientific and photographic, watch and clock industries are all becoming more interested in rural areas.


This article discusses some of the strengths and weaknesses of industrial parks as an aspect of overall industrial development. Particular attention is paid to the hazards which a small community might face in undertaking such a development.

One of the mistakes which a community group might easily make is to pay insufficient attention to regional location factors. The industrial park should be kept in perspective with the other factors in the community. It is not necessarily a cure-all for all local and economic problems. Another danger is that the importance of continued management may be overlooked once the initial development job is completed. The third hazard is an inadequate investigation of the ability of the community to support the bonded indebtedness, inadequate planning of transportation and utility company facilities, and the unwillingness of landlords to cooperate with the venture rather than attempting to exploit it for extraordinary profits. Finally, there is the danger that no commitment will be secured from at least one key tenant in advance of actual construction.


The purpose of this study was to determine: 1) the role highways play in new plant location as well as in decisions to expand or modernize existing plants; 2) industries which are most closely tied to highway transportation and their plans, 3) over-all economic importance of existing trends, and 4) what the organized trucking industry can do about playing a more important role in future decisions regarding plant location.

A questionnaire was sent to 5,200 new plants constructed between 1955 and 1959. The major conclusions were as follows:

(1) When the firms were asked to check the five most important factors influencing the location of their plant site, 72 percent indicated proximity to good highways, 62 percent indicated abundant labor supply, 62 percent indicated availability of suitable land, and 59 percent checked the proximity to markets as the most important factors affecting plant location.
The influence of the following factors varied sharply from industry to industry depending upon their needs: availability of raw materials, favorable state and local tax structure, favorable leasing or financing arrangements, abundant water supply, and proximity of related industries.

As the size of the establishment increased, measured in terms of employment, plant location factors of land, rail, water, and proximity of related industries tended to become more important.

Plant location decisions in industries which are heavily transportation oriented placed great stress on both highway and rail factors.

In future plant location decisions the highway, labor, land, and market factors will retain their importance, but such other factors as state and local tax structures, water supply, proximity to related markets, vocational training facilities, community cultural and recreation assets, housing for personnel, and the quality of schooling available for their children will receive more attention than they presumably received in plant location decisions made during 1955-1959 period.

The outward movement of many industries extends not only to the suburbs but beyond these suburban rings into small towns and rural areas.

More plants are using truck transportation for the movement of nearly all of their freight traffic than in the past. Most survey respondents either received or shipped 90 percent or more of their freight by truck, and in the case of nearly half of the responding firms, 90 percent or more of both inbound and outbound freight moved by truck.

Survey respondents reporting having moved to retain their same relationship relative to rail sidings—that is, rail siding plants moved to sites with rail sidings and non-rail siding plants moved to non-rail locations. But when the positions were changed, more non-rail siding plants moved to new sites with rail sidings than was the case with plants moving from rail sidings locations.

Often plants with rail sidings remained truck oriented.

Industrial groups containing the highest percentage of respondents that moved (industries in which plant location decisions are being made frequently) also tend to be heavy truck users.


A list of available industrial sites along with corresponding information on transportation, utilities, zoning, and tax rates.


This is a review of the new chemical and metals plants and investments in the Southeast Missouri area. Over $300 million were being spent for new plants and expansions within a 100-mile radius of St. Louis, Missouri. Included in the development are American Cyanamid's $15 million ammonium nitrate plant at Hannibal; Hercules Power's nitric acid plant at Louisiana (800 tons/day and billed as the world's largest); Pittsburgh Plate Glass's float-glass plant at Festus;
Rubberoid Company's $5 million plant at Annapolis; Dundee Cement's $55 million cement plant at Clarksville; Atlas Cement's plant at Saverton; and River Fuel Company's cement plant at Crystal City.

In the metals industry the new plants are Missouri Lead Operating Company's $30 million-plus mine, mill and smelter at Buick; Magnet Cove Barium Corporation and Montana Phosphate Products Company jointly building an $18.5 million development at Bixby; St. Joseph Lead Company's $11.5 million lead mine and mill at Fletcher, and $24 million mine and mill at Viburnum; Bunker Hill Company and National Lead Company's joint lead mine and mill at Higdon; Hanna Mining Company and Granite City Steel Company's joint iron pellet mill at Pilot Knob; Hanna Mining Company's pellet mill at Iron Mountain; Laclede Steel Company's facilities in St. Louis; and St. Joseph Lead Company and Bethlehem Steel Company's iron pellet mine at Pea Ridge.


From the national point of view, industrial promotion activities can be wasted effort even when they bring results to the local regional groups, if there is no industrial expansion, but merely relocation of industry.

The article lists three circumstances in which industrial promotion efforts can make a positive national contribution and six conditions under which it can make positive contributions to the local economy. The author concludes that a large share of the national promotional activity now underway is wasted effort, but that it does not need to be so.


This paper attempts to determine centers of economic activity and the extent of these centers' influence within the state. In addition, the paper identifies certain minor economic centers and considers the extent of their influence. These influences are measured in terms of correspondent banking systems, the distance between population centers, wholesale sales of numerous collection and distribution centers, and the retail sales of selected services by counties.

The paper concludes that the orientation of Missouri's correspondent bank relationship provides a reasonably good index for delineation of areas of economic influence of more important centers but not of less important centers.

The extent of influence of retail trade upon bank orientation is not known, but rural people may make major shopping trips to the same center in which their agricultural products are marketed.

The location of sub-center activities in the collection and wholesale distribution of products tends to substantiate the major Missouri Economic area as determined by analysis of bank relationships. Most such sub-centers are located near lines of balance between the major areas.

This study analyzes the major growth problems of the State of Missouri by (1) considering the structure of the Missouri and U.S. economies and comparing the net change in the structure between 1929 and 1954; (2) comparing the rate of growth of Missouri and the U.S. in the various industrial divisions; (3) analyzing the factors which have caused the growth rate of industries of Missouri to deviate from the national growth rate of comparable industries; and (4) summarizing the growth of the manufacturing division in the state.

Wages and salaries, value added, and sales were used as measures of economic growth. The study's conclusions are (1) the major problem of growth in Missouri seems to be the population loss of the non-metropolitan areas of the state; (2) loss of population from the state will be difficult to replace; (3) stemming this emigration is a complex problem which cannot be solved simply by a statewide program of industrialization which does not consider the problems of the non-metropolitan areas of the state; and (4) if something is not done soon, the problem in many areas of the state may well become insoluble.


This is a historical review of the economic growth and development of Missouri that finds that on a per capita basis four economic sectors of Missouri's economy evidenced faster growth than the national average.— (1) farms, (2) manufacturing, (3) transportation, and (4) communications and public utilities. The growth of Missouri's per capita civilian income from manufacturing over the period 1929-1958 was 118.8 percent as compared to the national growth rate of 85.5 percent. The growth in Missouri's manufacturing sector has been accompanied by a shift from the production of nondurables to durables. The fastest increase in a manufacturing category over the study period was in transportation equipment. Other strong growth categories were fabricated metals, stone, clay, glass, and leather manufacturing. Slow growth categories over the same period were chemicals and electrical machinery.

**Impact of Industrial Development**


The article discusses what benefits a new pulp mill would bring to the local community and the state as a whole, what problems would be entailed, and how
they can best be solved. The article concludes that for a radius within 50 miles of the location of the pulp mill plant there would be a considerable increase in employment, new investment capital, new market opportunities, and greater community growth. A pulp mill could be a strong asset to low-income areas within the state's economy.


This is the first part of a two-part analysis of industrialization in a small community. The objective of this report is to review the impact of industrialization on a small county seat town located in Douglas County in the South Central Ozarks. The study method used was the economic base criterion in which all necessary or available data were patterned and analyzed for some period prior to the occurrence of the event under study. These findings were then compared with a similar inventory collected at a specified date after the study event. Ava began its current industrialization in 1959, so the time period chosen for this study was 1953-64. Data were gathered from United States Government Census Reports, annual banking reports, state sales tax records, the Missouri Division of Employment Security reports, and a survey.

Conclusions as to the impact of the industrialization program included the following points. Both Ava and Douglas County had been experiencing a net decline in population prior to 1959. A special census in 1965 indicated that Ava had gained 240 inhabitants since 1960 while the county population declined by 10 percent. The cost of industrialization was high for both private and public sectors. The direct cost to the public sector for the three new industrial plants was over $400,000 and $574,750 for the private sector, which is largely the investment cost of the plant management in facilities. On a different basis, factory building construction costs alone required an investment of $3,143 per new worker. Factory building costs, equipment, and essential public improvements required an investment of $15,853 per new worker. All public and reported group investments required for industrialization or occurring after and as a result of industrialization required an investment of $25,075 per new worker.

The new industrial employment was associated with an increase in retail sales of taxed items during the period of initial employment, but sales of those items declined during the third and fourth years after the first factories started. Since this decline occurred during years when the agricultural price indexes and parity ratio were declining, it indicates that agriculture still had a strong influence on the strength of the local economy. The amount of "new money" used in local construction did not influence the volume of sales significantly.

There was an improvement in the general business picture with all business buildings in use and five new ones constructed between 1959 and 1964. In 1965 four more business buildings were constructed, four were extensively remodeled,
and two had improvements made in their appearance. Retail sales and bank savings gained in 1965, which were attributed to "new" construction activity and improved agricultural incomes.

Findings of this study indicate that towns considering increasing their efforts to obtain new industrial development should evaluate their activity in these terms:

1. The new industry should be considered primarily on the basis of its use of local resources, particularly local labor.
2. The community should have adequate, efficiently managed public utilities. Excess capacity to meet the needs of new plans is desirable.
3. Industrialization should be the best alternative use of capital invested because a serious evaluation of the costs required in industrialization may lead many small towns to consider other means of maintaining their economic viability. These might include more intensive efforts to increase efficiency of farmers, businessmen, and present industrial plants.


This is the second part of a two-part study dealing with the effects of industrialization on a small community. This study was designed to analyze the changes in local units of government and the business economy that resulted when new industrial plants were located in a rural area. The study centers around the case of Ava, Missouri, a small county seat town located in Douglas County in the South Central Ozarks. Ava began industrialization in 1959, so the time period chosen for the study was 1953-64. Data were gathered from United States Government Census Reports, annual banking reports, state sales tax records, the Missouri Division of Employment Security, and a survey.

In the first part of the study, it was revealed that the initial economic vigor stimulated by the establishment of three major industries was somewhat dampened by the continued loss of population and income from the farm sector. The findings concerning the impact of industrialization on local government concluded that the city benefited much more than the surrounding countryside.

Conclusions on the impact of industrialization on city government were as follows: 1) The ability to pay for services was increased. Property valuation increased by 61.9 percent from 1959 to 1964. 2) The increased ability to pay for services was greater than the demand for new services. The general fund tax rate was lowered from 75 to 60 cents in 1964. 3) Industrialization served as a catalyst to bring about the needed expansion and improvement of the sewer system and other public improvements. 4) Additional employees were hired by the city after industrialization.

Conclusions concerning the impact of industrialization on county government were as follows: 1) The county government did not receive the same bene-
fits from industrialization as did the city. 2) County operating expenses increased more rapidly than did assessed valuation or county receipts. 3) The increases in both receipts and expenses were not generally associated with industrialization. 4) County government is in need of more efficient organization.

Conclusions concerning the impact of industrialization on Ava R-1 School System were as follows: 1) Industrial employment probably slowed the population decline and thus caused larger school enrollments than would have been experienced otherwise. 2) Increased property valuation, especially in the city, increased the ability to pay for education.


This is a study designed to determine the economic factors responsible for the establishment of branch stores by the downtown department stores of St. Louis, Missouri. The major influence was the movement of the population to areas outside the city limits and the resulting decline in retail sales. Specific reasons given by store executives for establishment of branch stores were (1) to tap the growth potential of population and purchasing; (2) to reach areas of potential customers who were previously not purchasing a competitive share of merchandise in the downtown store; (3) to expand the store's total operation; (4) to service customers in an area not presently cared for; and (5) to supplement facilities of the parent store. Research revealed that decisions to establish branch stores were based on well-researched market potential, and the risks involved.


This is the final report to the Midwest Research Institute, Kansas City, Missouri, relating to the National Aeronautics and Space Administration-sponsored project bearing the same title. The purpose of the project was to evaluate the effectiveness of NASA programs in promoting regional economic development, and to provide a better statistical basis for decision-making in the field of economic development.

During a three-year period, a considerable amount of pertinent economic progress data on each of the 564 counties in the six states were generated and analyzed. The nature of this work involved the development of a methodology for making annual population estimates by county. Necessary data inputs were collected, resulting in the development of county personal income and population estimates for the years 1950 through 1962 in the six-state area. Principal investigators obtained cooperation from key professional personnel in the five other states.

A complete survey of the relevant information on plant location and industrial development facilities in Sedalia, Missouri. Included are sections on (1) community data; (2) transportation; (3) utilities; (4) labor; (5) taxes; (6) industrial financing; (7) recreation; (8) plant sites; and (9) miscellaneous information.

This plant location study received a superior rating from the Literature Awards Committee of the American Industrial Development Council at the forty-first annual conference in session at Seattle, Washington, April, 1966.

**Development Reference and Statistics**


A listing of all the available building space for industry and commerce in the State of Missouri. Included is a description of the building and its location as well as the availability of transportation facilities.


This is a brief review of available data essential to economic development in the state. Included are sections on community data, transportation, government, labor, manufacturing, fuel, power and water, education and research, taxes, markets, sites and buildings, raw materials, and miscellaneous.


The Ozark Region in this study encompasses 115 counties in Arkansas, Missouri, and Oklahoma. Employment opportunities have contracted, due to the decline in agricultural and forestry industries. Manufacturing employment has grown, but not fast enough to employ all of those seeking employment. Unfortunately, the manufacturing industries that have been attracted have been of the low-wage variety. Much of the land is not suited to agricultural purposes, except in certain specialized areas, such as poultry, dairy, livestock, and intensive crop areas. Pine trees are plentiful enough to support further expansion in forestry. Recreation centers are rapidly growing. Mining employment has contributed little to the economy and is not likely to expand. Only the larger urban centers are able to provide the public and private services that are needed for growth. Lack of education retards economic development.
Section II

Recreation and Tourism
The purpose of this study was to evaluate the opportunities for enlarging the economic base in the Missouri Ozarks by the use of resources for recreation. Specific objectives were to determine: (1) the importance of the tourist trade in contributing to the incomes of people residing in the area; (2) the proportion of the tourist dollar that goes to the rural people; (3) the characteristics of firms that cater to the tourist trade, whether or not they provide employment for rural people, and opportunities for careers in this type of work; and (4) the changes in types of businesses that have occurred to meet the needs of tourists.

The investigation included 31 counties in the Ozark area. Data were obtained by interviewing about 10 percent of all operators of retail and personal service establishments in the area. These data were supplemented by data from reports of the State Department of Health and Welfare for all motels in the area for the last 10 years and other secondary sources.

The volume of business of retail and service firms in this area was $319,500,000 in 1959; 21 percent of this amount was obtained from tourists. Operators of retail and personal service firms profited most from the tourist trade. Eighty-seven percent of these firms were operated by the owners. Sixty-three percent of the operators were born in the Ozark Region. More than 72 percent of the operators were raised on farms or had operated a farm. The rapid expansion of the tourist trade in recent years has increased the opportunities for local farm youth to become proprietors.

Most retail businesses were relatively small. More than 15 percent of the operators reported gross sales under $10,000 and another 15 percent reported gross sales of $10,000 to $19,999. As the age of the operator increased, gross sales decreased. Apparently, the younger operators, who had more formal training than the older operators, were able to obtain management jobs with the larger concerns or if their own business did not meet their expectations, they were more able to shift into a better paying job.

Operators of retail and personal service firms in the area employed 17,519 workers in 1959. About 97 percent of these people resided in the county in which they were working and had lived there prior to their present employment. As a result of the tourist trade, 5,321 more employees were hired than otherwise would have been employed.

In 1959, approximately $2,509,000 worth of locally produced goods was sold through retail stores to tourists. About 60 percent of this amount was income from food items. The number of retail and personal service firms has increased about 32 percent since 1950.

Approximately 38 percent of the retail and personal service firms in the area
have been established since 1950. The major increase has been in those that cater to the needs of the tourists. For example, the number of motels in the area in 1960 was 143 percent greater than 1950.

The recreational resources of the Ozark area have provided local people with many opportunities for new jobs. In 1959, the operators of retail and personal service firms estimated that about 21 percent of their business came from tourists. The amount of income they attribute to tourists has increased rapidly in recent years. Many new businesses are established each year to meet the needs of a steadily increasing number of visitors. Most of these businesses are relatively small. More than 75 percent of them have been organized by people who live in the area. Farm people have found this field of new industry open to them. Almost 75 percent of the operators of businesses were born on a farm.


This is the second report on the relative importance of the tourist trade to the economy of 31 counties in the Ozark region of Missouri. The first report (Bulletin 799) showed that tourists contributed about 21 percent of the total business done by retail and service firms in the area in 1959.

The purpose of this study was to determine (1) where the tourists come from, (2) which areas they visit while in the Ozarks of Missouri, (3) the kinds and amounts of goods and services they purchase, and (4) to project their impact on the local economy to the year 1970.

A random sample of 10 percent of all motel owners (29 managers) in the Ozark area furnished a list of guests for the first seven days of each month for 1960, showing the number of persons in the party, date of registration, how long they stayed, home address, and other pertinent data. They managed about 5 percent of all rental units in the Ozark area and were distributed throughout the region.

Information was obtained on 5,566 parties who stayed in the motels. Ten percent of all retail and service operators were interviewed. Each was asked to indicate his total volume of business and the share of this he thought was obtained from tourists visiting the area.

Projections to 1970 were made by fitting a trend line to the estimates. Further modification of the 1970 estimates was made by correlating Missouri State Highway Department counts of movements into the area with the volume of business.

The Missouri Ozarks was divided into these four recreational areas:

<table>
<thead>
<tr>
<th>Recreational Area</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake of the Ozarks</td>
<td>Benton, Camden, Hickory, Maries, Miller, and Morgan</td>
</tr>
<tr>
<td>White River</td>
<td>Christian, Douglas, Howell, Ozark, Stone, Taney, and Texas</td>
</tr>
</tbody>
</table>
Central Ozarks  Crawford, Dallas, Laclede, Phelps, Polk, Pulaski, Washington, Webster, and Wright

Big Springs  Carter, Dent, Iron, Madison, Oregon, Reynolds, Ripley, Shannon, and Wayne

Most of the patrons of motels located in various recreation sections of the Ozark Region in 1960 were from Missouri but not from the Ozarks. More than 99, 96, 93 and 88 percent of the guests staying in motels on Lake of the Ozarks, White River, Central Ozarks, and Big Springs sections, respectively, lived outside the 31 counties.

Motels in each of the four recreational areas studied were patronized by guests from different areas and with different family compositions. About half of the people who visited the Lake of the Ozarks area came from the metropolitan areas, St. Louis being the most prominent. Sixty-seven percent of visitors to this area stayed more than one night and 63 percent were in parties of more than two persons.

Most of the guests staying at motels in the various recreational areas were from homes less than 300 miles from the area.

In 1948, it was estimated that tourists spent $26,071,000 in this area, whereas in 1960, they spent $72,413,000. By 1970, this figure may go up to $124,898,000. By this time, tourist expenditures may represent 40 percent of the gross sales of all retail services forms in the area. They may be 10 percent greater than the value of all locally grown farm products. Services to tourists may provide job opportunities for over 85 percent more people than were employed in these services in 1960.


Clawson states that the Ozarks have many natural advantages for outdoor recreation. They are the largest and most rugged mountainous area between the Appalachians to the east and the Rocky mountains to the west.

On the other hand, the Ozarks have some rather major handicaps in seeking to develop a major tourist business. By far the most serious is the fact that no large urban centers are located nearby. St. Louis, Memphis, and Little Rock are fair to large-size cities, more than 100 but less than 200 miles distance by airplane.

In conclusion, Clawson cites the need for accurate, detailed data in present and potential future recreation use for the Ozark region. Who are the visitors, as far as income, residence, and other characteristics are concerned? What do they want in the Ozarks? What other groups of the population are potential customers? How might they be attracted?

This annual report on the tourist industry in Missouri is based largely on traffic checks made at 71 primary and secondary points throughout the year. In 1966 the businesses specifically catering to the traveling public—the major Travel Serving Industry—grew 9.4 percent as measured by gross sales. The 1966 tourist study concentrates on tourist expenditures. It ranks the counties of the state by their ability to draw the tourist dollar. The top five counties are Jackson, St. Louis County, Greene, Buchanan, and Jasper. These counties received 43.51 percent of the $721,738,000 spent by tourists in Missouri in 1966. If the $118,117,000 spent in St. Louis City is added to these five areas, almost 60 percent of all tourist expenditures in Missouri are accounted for.


This study was prepared in an effort to analyze the tourist industry in Missouri and arrive at numerous characteristics regarding the individual tourist visiting the state. The analysis is centered around traffic flow and pattern studies by the Missouri State Highway Department in 1950, 1957, 1959, 1963, and 1964 in conjunction with data from other state agencies. Other findings are reported from the Missouri Division of Commerce tourist questionnaires mailed to persons requesting vacation travel brochures in 1964.

Based on traffic flow studies 9 percent, or 5,491,433, of the motor vehicles entering Missouri were out-state vacation vehicles either destined for Missouri or passing through enroute to final destinations. Slightly less than half of all out-state tourists visiting Missouri originate in Missouri’s eight neighboring states. The state’s geographical location is responsible for most of the remaining half since Missouri may be considered a transit state (77 percent of the tourists spend one day or less in the state). The most important states in terms of the number of man-days contributed to Missouri’s out-state tourist industry are, in rank of their contribution: (1) California; (2) Illinois; (3) Kansas; (4) Texas; (5) Iowa; (6) Oklahoma; (7) Indiana; (8) Arizona; (9) Ohio; and (10) Michigan. Based on a population mobility study prepared by the United States Department of Commerce, 10 percent of all Missourians migrating go to California. Since they make return visits to their home state, the large California visitation figure results.


This publication is a guide to Missouri’s 42 state parks. Each park is described, its facilities and activities are listed, and the costs for services are given (where such exists). The Missouri state park rules and regulations for all activities such as camping, boating, swimming, hunting and fishing, as well as more specific rules on pets, fireworks, speed limits and fires are presented.

The objectives of this study were: (1) to inventory the social economic characteristics of the users of a particular area that were believed to be factors in the demand for water-oriented outdoor recreation and to determine the characteristics of the facilities desired by potential users; and (2) to determine the factors that affect the demand for water-oriented outdoor recreation facilities in the St. Louis area in order to estimate their effect upon the activities of the people.

The data were derived from interviews of 1,000 members of households in St. Louis City and St. Louis County. The factors found to be significant were annual incomes, education, sex, race, age, and occupation.

An economic model was built to predict the annual number of days of water-oriented outdoor recreation for a typical family with specific socio-economic characteristics.


This is a list of 74 public fishing waters managed by the Conservation Commission, either through ownership or other arrangements plus fishing areas managed by the Missouri National Forest Service. The list does not include large federal powers or flood control impoundments, city reservoirs, or other city, county, or private waters.


This study analyzes the economic impact of a new reservoir on the local communities in the Arkansas-White-Red River Basin area. Five areas are examined: (1) contribution of recreation to economic progress; (2) lakeshore development; (3) impact on nearby towns; (4) homesite development; and (5) impact on local government.

The study concludes that the development of recreation around manmade lakes is beneficial to the economy and social structure of the communities involved. Several problems concerning further development of these areas are enumerated, along with possible solutions for each. There is need for a more liberal land acquisition policy and for broadly conceived land-use planning. The effect of new industries on recreation areas should be studied. Local government revenues are inadequate to supply roads and other services related to the rise in recreation. Consideration should be given to a government sponsored loan program to provide concessionaires with capital to start or expand facilities.

This document presents a recreation plan for the Basins. Separate sections are devoted to plans for Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, Arkansas, and Louisiana. For each state discussion applies primarily to areas related to the Basins, though the general scope of the discussion is broad. Existing facilities are examined in detail. The estimated federal costs of proposed facilities are presented.


The major purpose of this study was to determine the present and potential returns from the various types of recreational business ventures that have been developed by Missouri farmers and the management problems that have been encountered in operating them. To obtain an inventory of the extent and kind of recreational enterprises, the county extension agent in each county in the state was asked to list the number of enterprises, by kinds, that were present in his county. The counties were ranked by the number of enterprises in each kind. The two top-ranking counties for each kind of enterprise were selected. Since several counties ranked first or second in number of enterprises for more than one kind of enterprise, only 17 counties were needed. The interviews were made in these counties.

There were 13 kinds of enterprises consisting of privately-owned fish ponds or lakes, fee trout lakes, picnic grounds, and access to fishing, fishing guides, fishing lures, fish bait farms, campgrounds, dude ranches, vacation farms, riding stables, shooting preserves, deer hunting, and summer camps in 1962.

In the analysis each kind of enterprise was analyzed to determine not only how successful the venture was financially, but whether it was a primary or supplementary source of income. Some of the recreational enterprises adopted by farmers in Missouri as a primary source of family income have been financially successful, but many have not. Some reasons for lack of success have included: (1) few of the operators had previous experience with the enterprise before they adopted it; (2) most of the operators had been either misinformed or had misjudged the demand for their facilities; (3) most farmers were catering to less than 30 percent as many patrons as they thought they could handle during the peak recreational season; (4) word-of-mouth advertising was about the only advertising method followed; and (5) little time and money were spent in making the facilities attractive to guests.

Scarcity of credit was not found to be a factor that limited the expansion of the recreational enterprise, for most operators indicated a reluctance to borrow any money.
The successful operations had the following characteristics: (1) the operator had specialized training in the undertaking before he assumed full responsibility for the enterprise; (2) the facility was in good condition; (3) the initial operation was of sufficient size to require the operator's full-time efforts; (4) the enterprise had been in operation more than 10 years; and (5) the operator had correctly forecast the demand for his type of facility.


This thesis investigates the Meramec River Basin of Missouri for the efficiency of alternative dam sights with the objectives of maximizing recreation benefits obtained from the facilities of free-flowing streams and reservoirs. This study considers several guidelines for general water resource planning and applies them to the development of the Meramec River Basin where recreation is the principal use of water. The methodology is based primarily on the benefit cost analysis. The study recommends the construction of a major reservoir at the lower reaches of the Basin near the chief location, the St. Louis area.


The major purpose of the Missouri Comprehensive Outdoor Recreation Plan is to provide guidelines for the allocation of funds and resources for needed recreation facilities. The Plan includes a complete inventory of public and private recreation areas and their facilities in the state, along with the results of a comprehensive survey of 3,674 Missouri family units concerning demand for principal outdoor recreation activities. From these data, recreation facilities needs — by recreation activity, by county, by recreation region, and for the state, as a whole — were identified and projected for 1965, 1980, 2000, and 2020.

At present, there are 3,069 recreation areas in Missouri; most are small, having less than 10 acres available for recreation activities. But in the state, as a whole, there are over 2.8 million acres devoted to recreation.

In 1965, Missourians participated in outdoor recreation about 608 million times. By far the greatest favorite among activities was the playing of outdoor games (163 million occasions), followed in turn by biking (135 million), walking for pleasure (63 million), pleasure driving (54 million), and swimming (52 million).

Of the total demand for outdoor recreation in Missouri, nearly 13 percent is
represented by out-of-state visitors. In terms of participation occasions, residents accounted for nearly 608 million occasions, visitors for 77 million. Visitors spent more than $462 million in the state for all items including transportation. This picture, however, must be balanced by the fact that Missouri residents also satisfied some of their demand for outdoor recreation in other states.

Non-resident visitors are either vacationers—who spend more than two days in the state—or tourists enroute who stay for shorter periods. On a total man-days basis, 18 million visitors to the state spent nearly 31 million days in Missouri. Detailed breakdowns by visitor state of origin are presented in tabular and graphic form at the end of this section. Information on out-of-state visitors was developed by the Missouri Division of Commerce and Industrial Development, based on an annual tourist survey.

Recreation areas, representing the "supply" side of the analysis, fall into two categories—developed and undeveloped areas. On an acreage basis, only about 2 percent of the state's recreation areas fall into the "developed" category.

There are 3,373 recreation areas in the state comprising a total area of nearly 2.8 million acres and slightly more than 154,000 water surface acres. Nearly half of the areas, and 110 new developments were identified, all in the planning stage.

In Missouri, developed recreation facilities account for 2 percent of total acreage, or 59,000 acres. In order of importance, the top ranking facilities are picnic grounds, occupying 11,291 acres, playfields (8,472), golf courses (6,264), group camping (3,438), and swimming beaches (2,644). To the last category must be added 1.4 million square feet of man-made swimming pools—about 32 acres—in order to appreciate the popularity of water sports. (Swimming pools not open to the general public were excluded from this inventory.)

Missouri has natural resources for recreation that are more than adequate to serve its own population, and its visitors. But the record indicates that continuing effort is necessary if these resources are to meet the ever-growing demands of the local residents and out-of-state visitors. Of growing importance, too, is the quality of resources.

The findings of the State Comprehensive Outdoor Recreation Plan focus on a number of problem areas in meeting the present and future needs and demands of both in-state and out-of-state outdoor recreationists. Toward overcoming these problems, the following points are recommended:

- The state (1) expand its programs for acquiring recreation acreages to include sufficient land for at least 50 years of expansion; (2) expand its recreation facilities development programs; and (3) enter into arrangement with other public and private bodies to provide both with high quantities of outdoor recreation resources, convenient to population centers.

- Public agencies acquire and reserve water-oriented acreages, shorelines, and related land resources and construct the greatly needed swimming pools in and near major urban centers.

- Urban areas plan to act to acquire more open space areas and utilize public agency regulatory power to zone areas for recreation development.

35
Legislative actions be taken to create incentives to open private investment in recreation development within the state.

Local governments establish and maintain recreation areas for the blind and other physically and mentally handicapped persons.

The state institute a continuing outdoor recreation planning program. The program should include updating of information on trends in recreation and changes in socio-economic characteristics of the population and a continuing inventory of recreation facilities and areas in Missouri. The program should also incorporate short and long term plans for financing outdoor recreation resource development with an increased emphasis on regional needs.


Two St. Louis county agencies cooperated in surveying the existing park facilities and the need for future expansion. They found that attendance at state and county parks increased from 45 to 267 index points over the five-year period, 1960-65.

The demand for park facilities was found to be increasing. The population of St. Louis County increased 73 percent over the 1950-60 decade and has continued at a rapid rate. Aside from the increase in numbers of people, other social factors, such as increased leisure time, increased family income, and increased spatial mobility, indicate an increasing proportion of the population making use of outdoor natural resources.

In the inventory and analysis of existing recreational facilities, it was found that present capacities are far below accepted standards. The total amount of public recreational land in St. Louis County was 10,689 acres. Based on the St. Louis County Planning Commission population estimate of 840,000 persons on January 1, 1965, the total park land per 1,000 persons in the county is about one-half of what the National Recreation Association recommends as a minimum. The City of St. Louis has a total of 3,116 acres in parks and playgrounds. The city has long been aware of its limited park land assets, but is unable to find the park space needed for expansion.

Based on the standards established for major county parks, and utilizing the 1980 population project of 1,175,000 persons in St. Louis County, the Commission has determined that at least 6,000 acres of major county parks must be established to meet the 1980 needs. However if the needs beyond 1980 are not considered, then as is the present case in the City of St. Louis, the future lands will most assuredly not be available. Utilizing a conservative standard of at least 15 acres of park land for every 1,000 persons, together with an estimate of future needs after 1980, the Commission has determined the need for at least 45,000 acres of regional park land.
The report describes 24 recommended county park sites and makes proposals for the development of the Lower Meramec River Basin and the western St. Louis County lands. Also included are recommendations for a Lewis and Clark Missouri River Parkway and several scenic roadways. These proposals are all indicated in a generalized manner on a map accompanying the report.

The Commission concludes its report as follows: "Acquisition of land for park purposes must be accomplished in the next few years if it is to be accomplished at all. Each year the amount of suitable land left dwindles rapidly, and the land that is left increases in cost proportionate to the rapid urban development. The pattern we establish for outdoor recreation in the next few years in this county will be the destined pattern for all time."

Statistics and Miscellaneous


This is the annual report of the four divisions within the Missouri Conservation Commission—Game Division, Fisheries Division, Forestry Division, and Field Division. The report contains information and statistics on all phases of the work carried out by the individual divisions. Also included are reports on research projects undertaken by the divisions and proposals for new state projects.


This is a state-by-state listing of non-urban public designed recreation areas: federal, state, and local agencies responsible for recreation management; name of area and its acreage; and county within which all or most of its acreage falls are shown also.
Section III

Agriculture
This report describes a sample of 49 farms in the Missouri Ozarks on which gross sales in 1960 were at least $5,000. The counties included are: St. Francois, Madison, Wayne, Ripley, Oregon, Shannon, Reynolds, Iron, Carter, and Dent. Emphasis is on characteristics of the farm operators and how they started in farming and gained control of sufficient resources to yield a gross income of at least $5,000.

The objectives of the study were to determine for the adequate farms the size of units, farm organization, changes made in farm organization since the operator started farming, the sources of capital, and other factors (including family help) which were important in determining their income.

Only younger farmers for whom farming was nearly a full-time job were selected. Three criteria were established to determine who would be interviewed. In 1960, the operator had to (1) be under 45 years of age, (2) have worked less than 100 days a year at a nonfarm job, and (3) have a gross farm sales greater than $5,000. The farmers who received family help had units with higher value per acre, fewer hogs, more beef cattle, more expenses and lower net farm incomes than those without help. Also, they worked more often at nonfarm jobs.

Of the 23 farms in the sample who had net incomes of more than $4,000 in 1960, 19 operated units valued at more than $50,000. Sixteen farms were at least 300 acres in size and nine had over 500 acres. Fifteen had at least 80 animal units of livestock. Of the 49 operators, 40 had a beef cow herd as their major enterprise. Those who had the largest net incomes also produced hogs, usually feeder pigs. Twenty-four operators had farms larger than 175 acres and had not changed their total acreage since they began farming full time. Of the other 25, 15 had enlarged their units to more than 400 acres by 1960.


Evaluates the present situation and projects the 1975 needs in such areas as (1) number of commercial farms, (2) number of adequate income farms, (3) acreage devoted to commercial farms, (4) entry opportunities on adequate income farms, (5) proportions of rural farm males needed to fill needs, and (6) the effects of these projections on vocational agricultural training. These projections are made for each of the eleven different economic areas, and for the state as a unit.
Historically purchasers of feeder pigs have obtained the pigs from farmers in their own locality. By 1956, a substantial number of feeder pigs had begun to move through auction markets and fewer through local and terminal markets outlets. Also, since 1956 the separation of hog production and hog feeding has tended to increase in both relative and absolute terms. The lack of an adequate rating system for feeder pigs in many instances has been a major problem in the feeder pig system. The attainment of a grading system comprehensive enough to at least indicate production performance is needed. A system of production by specification may become necessary in the future. Moves in this direction have been made in recent years in Missouri and other states with an emphasis on quality. Attempts have been made towards a semi-approach to specifications of pig production. Indications are that hog production will move toward fewer but larger units which means that larger size lots of uniform feeder pigs will be demanded by individual buyers. The larger finishing operations will be more concerned in the future with the conversion rates, cost per pound gain, and the rate of gain as methods to lower production costs and are likely to be concerned with uniformity cut out yields and the ratio of lean to fat. Markets handling feeder pigs must adjust in order to keep quality identified. Pooling by quality and uniformity must become more prevalent if the small scale feeder pig is to avoid price discrimination. One way to get uniformity is to first grade pigs on their genetic background and subsequently sort them on the basis of their physical appearance. The backgrounds of the breeding herds could be used to make the genetic distinction. Records and production testing for both the boars and sows used in a breeding herd would be required to make meaningful genetic classifications.

The Missouri feeder pig marketing system generally is believed to be comparable to that of other states and in some respects superior. Most of the markets within the state are showing improvements in their services to buyers and sellers and are working toward developing better methods of grading through encouraging the production of quality pigs. At least one agency is moving toward control of the genetic base of its members’ producing herds.


This bulletin reports the results of a survey of grain merchandising and processing plants undertaken to determine the existing market structure and organization of component industries. First, data are presented on the number, type
of ownership and operation, processing and merchandising volumes, and channels for acquisition and disposition of grain, for plants in Missouri, and other states in the region. Next, data on market share and organization of large firms are shown, where all plants under the same ownership are grouped together.


The purpose of this study was: (1) to determine how different management levels affect farm organization, structure, and income; (2) to ascertain if the degree of differences resulting from various efficiencies invalidates general organizational recommendations made for all management levels. A case farm was developed from survey data obtained from 65 farmers on Marshall soil in Lafayette County, Missouri. Optimum farm organizations were determined by linear programming for 25 management situations with respect to assumed opportunities for buying hay and/or grain. In general, results indicated more similarities than differences in optimal organizational structures for widely varying management levels. Incomes changed considerably with changes in management, but organizational structures remained similar. Under the conditions presented it appears that general recommendations made on the basis of average management would be most feasible and result in a minimum opportunity cost.


This is a report on information collected from 87 livestock auction markets throughout Missouri. The purpose of the report was to develop cost-return relationships for Missouri auctions which would be of value to owners and managers as standards to more accurately evaluate their own operations.

The auctions were divided into four groups based on total gross income. Group I markets were those with an annual gross of less than $20,000; Group II those with a gross income between $20,000 and $40,000; Group III a gross income of more than $40,000 but less than $60,000; and Group IV a gross income in excess of $60,000 annually.

Findings revealed that the number of auction markets in Missouri has been quite stable over the past 20 years; but there has been quite a high rate of turnover in ownership. The study indicates over 50 percent of the markets have changed ownership during the five years before 1962.

A large proportion of the smaller markets were individually owned. Over 82 percent of the markets in Group I and 56 percent in Group II were of single
proprietorship. Corporate ownership accounted for over 53 percent of the markets in Group IV.

Income sources were commissions, yardage, rent from facilities, advertising in arena, sale of veterinary supplies and lunch room services. Most of the income for all groups was from commissions. Commissions and yardage as a percentage of gross sales decreased about 15 percent from Group I to Group IV.

Labor was the largest single item of cost for all markets, accounting for over 50 percent of the costs for the two smaller groups and over 45 percent for the two larger groups. Advertising was the second largest cost in all except Group I, where interest charges exceeded all except those for labor.

The low cost markets had from 20 to 40 percent less costs per $100 gross income than the high cost markets. This indicated that means of decreasing costs provided the best opportunity of increasing net income. All costs and income information is listed by groups in tabular form.


The overall objective of this study was to provide information on the organization, minimum cost resource requirements, and size of farm required to obtain selected levels of income to operator labor and management. The study centered around the Blackwater-Lamine townships of Cooper County, Missouri, as representative of the farming areas commonly found in central and northern Missouri. Linear programming was employed to determine the minimum cost resource requirements for labor and management returns of $5,000 and $7,500 using various input costs.

Two solutions were programmed at each income level and corresponding cost variations. In one, the dairy enterprise was included; the second set excluded dairy. At the $5,000 return level the revenue producing activities were dairy, beef, market hogs, soybeans and wheat. With the dairy enterprise excluded, the only revenue producing activities entered were market hog and beef production. The types of enterprises included at the $7,500 return level were much the same as the $5,000 level, but on a larger scale.

When all the land in the study area was assumed to be variable, the number of farms possible at the $5,000 level exceeded the existing number in the area. At the $7,500 level the number of farms would have to be reduced from the existing level.


Investigates the effect of storing seed cotton in the Delta region of southeast Missouri. If cotton could be stored prior to ginning the length of the ginning
season could be lengthened, thus providing an opportunity to lower ginning costs.

Cotton was stored during 1961 and 1962 for 120 days each season. The stored cotton was sampled and tested each 30 days of storage and, after ginning, was classed, fiber tested and spun in mill tests. The technique was to compare the results of the tests made each 30 days with the results of the tests made from the same cotton source prior to storage.

Results showed that cotton stored for the entire 120 day period performed equally well as that ginned at time of harvest. Variations did occur, in such measures as grade, staple length, and uniformity ratio in the lint and foreign matter and moisture content in the seed. However, these variations could not be explained by, or traced to, storage.

Value of the cotton seed was not different than at harvest time, but changes in the market value of the lint did occur during the storage period. There was a gain of $1.15/bale during the 1961 storage season and a $3.00/bale loss during the 1962 season. Implications were that no loss or gain could be anticipated over a period of time due to storage for ginning. Different types of storage were studied for their effect on fiber and seed quality, and no differences were noted.


The primary purpose of this study was to gain a better understanding of the nature of part-time farming operations and problems associated with the organization and operation of such units. To accomplish this, the first part of the study utilized state and national census data to trace the historical development of part-time farming. Secondly, a complete survey of all farm units in a two-township of Cooper County, Missouri, was conducted.

Results indicated that part-time farming was an important facet of the rural economy even though the area contained no significant industrial base. The adjustment problems of the part-time farmers revolved around the fact that the farm organization had not been planned to utilize the short labor force.

In general part-time farming is becoming a way of life for a growing number of farm families. It was being used by farmers of the study area for a dual purpose: (1) to supplement a declining farm income resulting from the cost-price squeeze in commercial agriculture; (2) as a defense against the rapid commercialization of the family farm which threatens to push many farmers out of agriculture. The success of this strategy is evidenced by the following facts: (1)
27 percent of the classifiable farm units were operated as part-time farms and this percentage has been on the increase on both the state and national level; (2) the level of living of part-time farm families was above that of all commercial farm families with comparable resources. In fact, had the part-time farmers made better use of their farm resources they would have been able to enjoy a level of living favorable to that of the largest commercial farms in the area; (3) part-time farming appears to be a permanent way of life. The average number of years experience in part-time farming for all units was 12.5 years with 65 percent reporting 10 years or more experience.


This study reviews the progress of 62 young farmers who started farming in a 15-county area in North Central Missouri in 1953. Results showed that by 1959, 10 percent had dropped out of farming. The remainder had increased the land and capital under their control materially. Analysis determined the following factors to be most important in contributing to a successful start in farming: (1) Previous farm experience and training; (2) Substantial aid from relatives including both financial and non-financial help; (3) Control of adequate resources for efficient use of the family labor force; and (4) Income from non-farm employment.


This publication is primarily a graphic presentation of the data collected in the 1964 Census of Agriculture in Missouri. Graphs depicting the trends in Missouri agriculture accompanied by brief explanations are presented. However, the majority of the information presented is by counties and shown on a map of Missouri, coded so that the major areas of production, ownership, income, are easily discernable.

Among the factors present in this report were the following: (1) Missouri’s gross farm income in 1964 totaled $1,053,641,770, ranking 8th among the 50 states. Nearly two-thirds (62 percent) of the state’s total farm income was from the sale of livestock and livestock products; (2) Missouri’s agriculture ranked in the top ten states in 23 production categories. Among these categories Missouri ranked 1st in the volume of liquid and frozen eggs and the number of egg drying plants; 3rd in total cheese produced; 4th in hogs marketed; 5th in soybean production; 6th in corn harvested for grain; 7th in grain-sorghum production; 8th in winter wheat produced; and 10th in milk production; (3) while all of Missouri’s 114 counties report over $400,000 in agricultural receipts, two areas
of highly commercialized production stand out—(a) the rolling, productive loess deposits of west central and northwest Missouri, and (b) the black, fertile alluvial flood plain of the Mississippi Delta in southeast Missouri.


This publication is concerned with factors which affect off-farm grain movements and the importance of each of the individual factors such as price, contract selling, the elevator speed of unloading, elevator storage services, elevator sideline services, the elevator management, the grade weight, and the distance to the elevator. A survey conducted by the farmers cooperative service and the University of Missouri in four areas of Missouri concluded that (1) approximately 61 percent of the grain volume in these areas moved off the farm during the harvest of 1956-57, (2) an estimated 78 percent of the grain receipts at local elevators were delivered in loads ranging up to 150 bushels; (3) 96 percent of the farmers said that they would not be willing to accept a price discount to get grain unloaded immediately during harvest season even if they had to wait as much as 15 minutes; (4) approximately 75 percent of the farmers rated price and distance to the nearest elevator important in determining the place of grain delivery, 89 percent of the elevator operators thought that price was important, only 44 percent distance; (5) 66 percent of the farmers and 86 percent of the elevator operators considered speed of unloading as being important in selecting an elevator; (6) almost all elevator operators thought proper grading was one of the most important factors in the minds of farmers in deciding to market grain at a particular elevator but only 53 percent of the farmers indicated this.

**AGRONOMY (SOILS AND CROPS)**


A preliminary report on a cooperative research program between Anheuser-Busch, Inc. of St. Louis and the University of Missouri to study the malting qualities of Missouri grown barley. The tests began in 1961 using existing barley varieties to determine which had the best potential as a malting variety. From these experiments, researchers have been developing a two-row barley-Carsterns which has given most promise.

At present malting barley in Missouri is being produced commercially under contract on a limited basis. If suitable winter hardy varieties can be found, or developed, that meet the quality requirements for malting purposes, an expanded market may develop for malting purposes, and expanded market may develop for malting barley in Missouri.

This study discusses nutrient deficiencies and seasonal changes in the blue-stem (*Andropogan scoparius*) that affect cattle nutrition. It is concluded that little bluestem ranges do not furnish good enough forage for year round grazing, but when used in a ranch operation which includes improved pasture and supplement feeding, they can furnish nutritious forage for several months.


The specific problem considered in this study was the occurrence and variability of drought and the effects of drought on corn yields. The main objectives were: (1) to study methods of measuring the climatic factors affecting corn yields, and to compute indices of these drought measures; (2) to evaluate the usefulness of these drought indices as measures of the climatic factors affecting corn yields by determining their correlation with corn yield data.

The analysis included 48 years of weather and corn yield data from Plot 18, Sanborn Field, University of Missouri - Columbia. Results indicated that weekly observations were the most effective measure of drought. The analysis of weekly rainfall data suggested that rainfall during the last week in June, beginning June 28, and during the early weeks of July has the greatest effect upon corn yields. Drought in July and the first part of August had the greatest negative effect on corn yields.


This study was made to determine the position of the industry at the present time, what conditions have caused Missouri to be in its current position, and what adjustments can be made to improve the position of the industry in the coming years.

Data collected were for the four major producing areas: (1) the St. Louis area including St. Louis City and St. Louis County; (2) the Kansas City area which includes Kansas City plus Jackson and Clay counties; (3) the Southwestern area which includes Greene, Lawrence, Christian, Barry, and Stone counties; and (4) the Southeastern area which included Cape Girardeau, Scott, Stoddard, New Madrid, Mississippi, and Dunklin counties.

For each producer interviewed the following information was obtained: the type of operation; the ownership of land; the time spent in vegetable farming;
the inventory of assets controlled by the operator; the acreage; the type of area in which the farm was located; the use of irrigation water; how, when, and where the crops were marketed; and the method of sale.

In addition the following information was gathered for each of the production areas in general: (1) topography; (2) rainfall; (3) growing season; (4) land price; (5) transportation; (6) type of crops; (7) facilities for packing and storing; and (8) facilities for marketing produce.

In general, it was found that Missouri’s vegetable industry has declined in importance since 1935. Development of frozen foods has resulted in a reduction in the use of fresh products which had been the type of production and marketing facilities utilized in the state. Physical conditions favor vegetable production in the areas’ studies, but adjustments are needed in the production and marketing facilities to meet the high quality specifications of the present day markets.


This is the fifth year report and five year summary of experiments designed to determine corn yield response to nitrogen applications at different planting rates. These experiments were conducted at University farms located at Spickard, Marshall, Columbia, and Portageville. Seven nitrogen treatment rates (0 to 200 pounds/acre) and four plant populations (9,000 to 24,000 plants/acre) were used to test yield response at the widely separated locations.

Response varied according to the soil type and weather conditions at the different sites. In general the most profitable yield (not to be confused with the maximum yield) at the different locations over the five-year span were as follows: Spickard—100-150 pounds of nitrogen on 14,000 to 16,000 plants/acre; Marshall—low rainfall years 25 pounds of nitrogen on 10,000 to 13,000 plants/acre, and in above average rainfall 75-100 pounds on 14,000 to 17,000 plants/acre; Columbia—conditions and results were so erratic as to preclude generalization; Portageville—Irrigated field-150-200 pounds of nitrogen at 20,000 plants per acre.


This bulletin, and the soil map it contains, gives general information on the soil resources of Missouri. It describes the physical characteristics of the soils in different parts of the state, and defines the significant features that affect use of the land and improvement of the soil.

More detailed information is available in the form of soil maps or reports for 48 of Missouri’s 114 counties, through the Soils Department, University of Missouri.

This is a report by members of the Missouri Cotton Industry who in cooperation with the University of Missouri, College of Agriculture, and Extension Division sought to evaluate the situation in the Missouri Delta. A central steering committee appointed 15 study groups to investigate different facets of the cotton industry. Each study group was to set goals and objectives for this study area, and to make suggestions and recommendations as to what will be needed to accomplish these goals. The report is divided into five parts: (1) farm management; (2) production (including sub-sections on land preparation, soil fertility, cotton varieties, production equipment, land grading and drainage, weed control, insect control, disease control and irrigation); (3) processing (deflation, harvesting, and ginning); (4) marketing; and (5) labor.


Significant loss of nitrogen from the soil occurred, and the extent of the loss was related to soil type and the nitrogen carrier used. Fine clay soils and sandy loams showed the greatest losses. Results indicated that greater efficiency of nitrogen recovery is obtained where the nitrogen salts are mixed in the soil rather than applied to the surface. A deficit in nutrients other than nitrogen limited the recovery of nitrogen.


This report concerns the corn date-of-planting studies conducted at the North Missouri Research Center located near Spickard for the five-year period of 1960 through 1964. Four dates of planting were made on or about April 20, May 10, June 1, and June 20 each of the five years. In addition the experiment sought to determine the reaction of hybrids of different maturities to different dates of planting. Maturity groups of 90, 115, 125, and 140 days were selected.

Results indicated: (1) Highest acre yields can be expected from plantings made between April 20 and May 10, (2) Relative yield response of hybrids of different maturities to the four planting dates was about the same; (3) the earlier planting dates gave the highest average yield in each of the five years the study was conducted.
LIVESTOCK AND POULTRY PRODUCTION


A detailed analysis of production methods, including building requirements, disease problems, and marketing information.


This is a first-year report of a two-year study of feeder pig production and costs in six south central Missouri counties (Dent, Douglas, Laclede, Maries, Oregon, and Texas) in 1962.

The specific objectives of the study were: (1) to determine physical input-output relationships and costs and returns of feeder pig production in South Central Missouri; (2) to determine the extent to which factors such as size of enterprise and level of technology influence the physical and monetary input-output relationships in the production of feeder pigs; (3) to determine the implications of feeder pig production to the farms in the area.

Major findings revealed that it cost farmers an average of $110.09 per litter to produce feeder pigs with a range of $42.50 to $198.30. The variance in costs resulted largely from differences in labor charges. Labor costs per litter declined as the size of the feeder pig enterprise increased, to the extent that the labor cost per litter in the 61-and-over litter class was less than 40 percent of that in the 5-20 litter class. The average net return to labor and management per litter increased steadily as the size of feeder pig enterprise increased. Enterprises in the 5-20 litter class averaged $26 per litter while those in the 61-and-over class averaged $30 per litter. Higher gross returns for farms farrowing more than 40 litters per year resulted in higher net returns and appeared to be the dividing line between small and large producers.


Among the factors studied were (1) different levels of feeding sows during gestation (limited fed sows generally gave a better performance than the more liberal fed sows); (2) Number and weight of the pigs in each litter (the smaller litters tended to weigh more) and the relationship of litter size to mortality rate (the most important factor, regardless of death cause, was birth weight); (3) the
effect of therapeutical levels of antibiotics at breeding time on reproductive performance (antibiotic treated sows farrowed 18.3 percent larger litters and weaned 29.8 percent larger litters).


A progress report on the first-year tests at the University's Weldon Springs experimental feedlots. The primary objectives of the studies were to determine the effects of facilities upon the performance of cattle grown and then finished under a good system of management. All lots were fed the same ration and handled as near alike as possible so that differences in performance would reflect the differences in facilities rather than other factors. First-year tests centered around the amount and kind of protection from the weather and lot conditions caused by the weather (dirt vs. concrete). Differences in rate of gain were not statistically significant but did indicate trends, i.e. those fed under the better system showed higher gains (.22 lbs./day). The weather during the 1965-66 feeding period was very favorable, and researchers expected greater differences under more normal conditions.


In this study researchers found the season of hatch to have a significant influence on egg production and performance. Hatches were set for February, June, and September with the following results: (1) Birds tended to cease to lay from June to November at about the same rate regardless of whether they had been in production four, seven or ten months; (2) Culling rates were much higher with June and September hatches; (3) Labor income for the February hatch was $112.54 per 100 pullets, $110.55 per 100 pullets for June, and $83.41 per 100 pullets for September birds; and (4) The retention of yearling hens (from February or March hatches) for an additional two to four months of production offered the best solution for a source of large eggs at the time of the highest seasonal prices.


This publication reports on feed consumption and costs of farmers operating various sizes of beef cow herds in 17 North Central Missouri counties. These farmers were pre-selected and enrolled in a Farm Business Research Panel for a special study of beef cow systems. Panel members kept detailed records which
are analyzed in this report. Major findings revealed that feed costs represented the largest single production expense. Analysis indicated that as the roughage requirement is increasingly supplied by pasture or stalk fields, the feed costs are significantly reduced. The profit margin per cow was achieved by those farmers who 1) were able to reduce the winter feeding costs, 2) regularly achieved a high percent calf-crop, and 3) produced the heaviest weaning weight calves.


In two summer trials and one spring trial gains of lambs fed rations containing approximately 60 parts concentrate to 40 parts roughage were significantly higher than those fed 40 percent concentrates. They also had higher yields, required less feed per pound of gain, and graded slightly higher in the carcass. Crude protein levels of 14 percent gave significantly faster gains than rations with a 10 percent level of crude protein. Implanting stilbestral or hixestral increased feed utilization and gains, especially at the lower protein levels. In trials between pelleted and meal rations, pellets gave the following advantages; greater feed consumption, faster gains, and superior carcasses. Shearing of lambs fed at warm temperatures increased gains, but decreased gains during cold weather.


Report on a series of experiments with the following objectives and results.

1) To determine what kind of feeds and forms of feeds appeal to suckling lambs. *Results*: the most acceptable single ingredient tried was soybean oilmeal. The most acceptable feed mixture was 60 percent corn, 30 percent soybean oilmeal, and 10 percent bran or alfalfa meal. Pelleting the feeds improved the palatability in all trials, but the addition of sweeteners did not enhance the appeal.

2) To test the theory that a palatable feed results in faster, more efficient gains than one which lambs like less. *Results*: lambs on the more palatable mixtures ate 228 percent more feed, gained 19 percent faster, and graded higher than those on shelled corn alone.

3) To determine the value of adding antibiotics to a creep ration. *Results*: with healthy lambs and ewes, antibiotics gave no advantage.

**CONSERVATION AND IRRIGATION**


The Missouri counties involved in this area are Newton, Barry, Vernon,
Christian, Lawrence, Stone, McDonald, Cedar, and Dade. The area's problems and then opportunities are all listed as well as present activities and interests, coordination of facilities and additional facilities needed and the benefits expected from their proposed plan. Several tables are listed such as conservation needs, land retirement needs, amount of land and various capability classes, average farm income, monthly recipients of welfare, total expenditures for the monthly recipients of welfare, total expenditures for the fiscal year by counties and median family income.


Irrigation practices were found scattered over the entire state, but the heaviest concentration was found in the Southeastern Delta and the Northwestern corner. This report covers the time period from 1921-1959. The largest expansion in irrigation has occurred since 1950. The size of farms on which irrigation was used averaged 494 acres with an average of 338 acres tillable.

Irrigation was found to have been a common practice in the vegetable producing areas concentrated near St. Louis, Kansas City, St. Joseph, and Springfield. The irrigation of field crops proved to be a relatively recent innovation, the majority of which occurred after 1950.

The field crops irrigated were corn, cotton, pasture and hay, grain sorghum, and small grains. Of the specialty crops, vegetables, orchards, nursery stock, flowers, strawberries, and tobacco were irrigated. Corn was the major irrigated crop in terms of the total number of acres irrigated from 1954-58. Pasture and hay crops were second in importance. Cotton was third and vegetable crops were fourth. Vegetables were the only crop for which the total number of acres irrigated increased each year during the 1954-58 period.

Water was used on a wide range of soil types. Twenty-eight percent of the farmers irrigated crops on silt loams; 28 percent on sandy loams; and 11 percent on clay or clay loam soils. The rest were irrigating crops on a combination of soils.

Wells, natural streams or rivers, natural lakes or springs, constructed reservoirs, city water, and drainage ditches were sources of water for irrigation. Wells were the exclusive source for 40 percent of the irrigators and wells in combination with another source for another 8 percent. Natural streams and rivers were the entire or partial source for 37 percent of the irrigators. Constructed ponds or reservoirs were the only source for 8 percent of the irrigation.

Water was applied by sprinklers and by surface methods. Seventy-eight percent used portable pipe and sprinklers exclusively. Water from portable gated pipe or ditches to furrows were the two methods of surface irrigation. Sixty-five percent of the irrigation used internal combustion engines other than farm tractors for pumping water. Twenty percent used farm tractors; 7 percent used elec-
tric motors; and 6 percent used a combination of the three methods. Two percent used city water which did not require pumping.

The investment in irrigation equipment in 1954 ranged from $1,596 per farm on which an average of 4.5 acres were irrigated or a per acre cost of $351, to $10,871 for a 266.8 acre average or $41 cost per acre. The difference in costs per acre was not only due to the number of acres irrigated, but to the size and type of irrigation equipment.

Ninety-two percent of the farmers were satisfied in various degrees with their past experiences with irrigation. The degree of satisfaction was related to the type of crop irrigated. None of the specialty crop irrigators were dissatisfied. Eighteen percent of the cotton producers, 9 percent of the corn growers, and 8 percent of the pasture irrigators were concerned about the costs and returns or the additional work required.

Farmers dissatisfied with irrigation gave the following reasons: (1) irrigation required too much labor, and it was difficult to hire workers to move pipe in tall crops; (2) the extra yields did not cover operating costs; (3) at times, rain immediately after irrigation had harmed the crops on poorly drained soils; (4) irrigation conflicted with other farm work; (5) their present irrigation system did not distribute the water fast enough; and (6) some of the farmers who had graded or “leveled” their land for surface irrigation reported a decrease in crop yields.

While 8 percent of the farmers who had been irrigating stopped the practice, 44 percent expected to increase the number of acres irrigated within the next five years.


This article states that the following seven items are major forces that influence the market value of farm land: (1) In a dynamic society, land moves into the use that yields the highest economic return; (2) land values are determined at the highest level of economic use and then spiral downward to the lower use, and the lower productivity potentials; (3) non-agricultural capital is entering the farm real estate market in another way through the purchase of real estate for investment and to a certain extent for speculative purposes by non-farm people; (4) the role of land as a factor of production in agriculture is changing, for as farms become larger, more commercialized, and more specialized, the value of agricultural land tends to rise because the productivity rises; (5) there is a larger demand by farmers for land to expand their operations; (6) buildings have less influence on market value of land than in the past, as there is a tendency to appraise buildings in terms of replacement less depreciation rather than their present or future values to the farm business; (7) the effects of government programs, such as the federal land bank which has reduced the interest rates on farm mortgages and made them relatively more uniform throughout the county, causing land buyers to lower their capitalization thus increasing land values.
This report involves a comparison of sprinkler and surface methods of application of irrigation water on corn plots. The study was conducted on sharon silt loam at the Soil Conservation Service Plant Center, Elsberry, Missouri, from 1955-1958.

Results were as follows: (1) A mean depth of 1.96 inches of water per application was placed in the root zone by the furrow method as compared with 2.22 inches of water by the sprinkler method. (2) Mean water application efficiencies as indicated by these data were 68 percent for the sprinkler method and 62 percent for the furrow method. (3) Both methods gave significant increases in yield. However, the differences between the two methods were not great, leading to researchers to conclude that under similar soil and topographic conditions the choice between sprinkler or furrow irrigation would depend upon equipment and operational costs.
Section IV

Forestry and Forestry Products
FOREST AREAS


This study sought to determine the contributions of forests to the rural economy in a Missouri county that was 70 percent forested. A random sample of open-country rural households yielded 18 vacant homes, 71 non-farm households and 69 farm households. Total land holdings of the farm households averaged 234 acres and the non-farm households held an average of 71 acres. Approximately 50 percent of the land holdings were forested.

Sawtimber made the greatest contribution to incomes, but the largest single product sales was in the form of fuel wood.

Two factors prevented the area residents from receiving a higher return from their timber resources. First, the quality of timber was generally poor. Seventy-one percent of the gross volume of the forest stock was in trees that would not make logs of sufficient size to meet minimum specifications for standard lumber logs. Secondly, the passive attitude toward the forest resources of the area precluded any attempts for improvements. Householders believed that investment in forestry practices would not earn a satisfactory rate of return. A minor group actively engaged in annual burning of woodlands.

Conclusions indicated that improvement in timber quality offers the best prospect of increasing returns to the landowners. The greatest short term aid to improving timber quality is the development of markets for wood that is not now merchantable. Before any substantial increase in income can be expected it is imperative that desirable timber growing stock be built up by 400 percent or more. Desirable growing stock consists of species that grow rapidly, have few defects, and are readily sold.


Small forests dominate the region and have economic factors which differ from those of large tracts of public land. Though part of this study applies to most forests in the region, the evaluation here aims specifically at the small forest of less than 5,000 acres.

This study describes the economic resources and the land-use problem of the Ozark situation, its forest resource and how it is managed, its timber yields, the market for Ozark timber products, and the cost and returns for forest owners in the future.

The article concludes that the economic potential of small forests in the Missouri Ozarks is good. Managed forests can provide an adequate return over much of the region under conditions common today. Some forests offer outstanding
production opportunities. Improved market conditions would raise potential returns even higher. On sites where timber production is a reasonable alternative to other uses large, long-range investments are clearly justified. One of the best ways to get maximum returns is to manage for high quality and high volume production, beginning early in the life of the timber stand.


This paper reports the findings of the second comprehensive forest inventory of Missouri which was taken between 1958 and 1960. Changes in timber cutting practices and land use and management since 1947 have altered the forest situation. This resurvey reveals the changes that have occurred and the trends that have developed.

Statistics gathered in this inventory show that the timber has improved since the first survey in 1947, mainly because the public attitude toward timber-growing is better and methods of fire protection have been improved.

Efforts to restore pine have paid dividends. Pine is now the major component of 330,000 acres of commercial forests in Missouri. Growing-stock volume increased by 66 percent and sawtimber increased 45 percent in the 12-year period between inventories.

Sawtimber is generally smaller and hence of lower quality than in 1947, but the sawtimber is younger and has a higher quality growth potential. The supply of this young sawtimber is increasing at a rapid rate.

In general the state’s woodlands are still in poor condition and are producing far below their potential. Only 12 percent of the 15,000,000 acres of the productive forest land is well-stocked with merchantable or potentially merchantable trees.

While over-all the actual cut of timber is less than the desired cut, a few important timber species are being over-cut, especially the large trees in which high quality wood is concentrated. As a result, the supply of sawtimber in trees more than 15 inches in diameter has been dwindling at a rate of 56,000,000 board feet per year over the past 12 years.


Most of the forest land in the northwestern Ozarks of Missouri is poorly stocked and produces far below its capacity. Only 30 percent of the standing trees are suitable for future management. Forty percent of the trees are cull, and another 30 percent should be harvested soon because they are old, rough, or defective.

The kind of cutting needed to improve the forests of the northwestern Ozarks has been determined, but unfortunately, is not being practiced. High-quality
trees of preferred species continue to be cut at a faster rate than they are growing, and if this trend continues, traditional forest industries can expect shortages of higher quality timber. The two factors of added fire protection and insufficient commercial markets for small trees means a continuing increase in the volume of small low-grade trees. The addition of any new industry that could utilize this material would benefit both the forest and local economy.

Improving the region's forests is the job of woodland owners, but the impetus must be supplied by forest scientists. Few of the region's woodland owners are managing their forest land for timber crops, and they probably will not invest in timber-growing enterprises until they have been convinced that an investment in forestry will pay dividends. The problem of selling forestry in a region such as the northwestern Ozarks is particularly challenging because the production capacity of much of the forest land is low. More scientific investigation is needed to determine where and how the limited funds available for forestry can be used most efficiently. Recent studies by the Columbia Forest Research Center and the University School of Forestry are expected to shed much light on this problem.


The Missouri Prairie Region is divided into two subregions. The Northern Subregion spans the entire northern third of the state and contains 13 million acres. The Southwestern Prairie Subregion extends south along the western boundary from the Missouri River on the north to Jasper and Lawrence counties on the south, and contains 6.5 million acres.

This Prairie Region is largely farmland with only 15 percent or 2.9 million acres devoted to forest lands. Acreages in sawtimber have doubled since 1947 but stand only at a little over one million acres or 37 percent of the total commercial forests.

The elm-ash-cottonwood combination is the major forest type of the Prairie Region. This combination comprises 48 percent of the commercial forests and 55 percent of the region's sawtimber. Another 30 percent of the commercial forest trees is of the upland oaks and hickory varieties. Site quality is poorer on the average in the Southwestern Subregion than in the Northern due largely to the better soils in the north. As a result the Southwestern Prairie Subregion contains 119,000 acres or 86 percent of the post-blackjack oak type, while the Northern Subregion contains all the region's acreage of lowland oak and 84 percent of the white oak type.

Farmers own 78 percent of the commercial forests in the prairies, private owners possess 21 percent, and the remaining one percent is in public ownership.

Growing-stock volume and volume per acre have increased since 1947, but the growing-stock quality remains low. Estimates indicate a desirable annual har-
vest of 400,000 cords of timber. However, in 1958 only 143,000 cords of growing stock were cut. Better management would greatly enhance the income potential of the timber resources of Missouri’s Prairie Region.


Scientific forest management is needed to improve the woodlands of the border region. Only 44 percent of the present trees are suitable for future management (crop and storage trees). Twenty-nine percent are cull, and 27 percent should be harvested soon because they are too old, rough, or defective to manage for commercial products.

Because markets for small and low-grade growing stock are lacking, there is an ever-increasing excess of this material. Even more important, the large, high-quality trees of preferred species are being over-cut. Unless this trend is halted, local timber-based industries may encounter shortages in the kind of timber they have been accustomed to using.

Timber growing opportunities are as favorable in the Riverborder as in any other region of Missouri. Most woodlands are readily accessible, local markets are plentiful, and an excellent road and river system links these markets with the forest resource. The productivity of forest land is generally higher than in other regions of the state, and some of the best timber sites in Missouri are found in the Riverborder Region. These comparative advantages imply that higher returns per unit of labor and capital invested are attainable from forestry in the Riverborder.


Forests occupy 3,214,000 acres or 58 percent of the land in southwestern Ozarks, and the woodland is well distributed. There are some 200 primary-wood-using industries in this area which contribute to employment, income, and recreational well-being of the people. All but 2 percent of the forest is classified as commercial for timber crops. Most of the non-commercial forest is unproductive and incapable of growing crops of industrial wood because of poor site. The remainder is land in state parks, that is reserved from cutting. Hardwoods predominate in more than 95 percent of the commercial forests. About half of the forest is typed as black-scarlet oak, and one-fourth is post-blackjack oak, which typically occurs on poorer forest sites. Softwoods are a major component on only 153,000 acres. The region contains 20 percent pine and 65 percent red cedar.

Since 1947 forest area has increased 84,000 acres or 3 percent. A large amount of forested land area was lost to new water impoundments, urban expansion, and other non-forest developments, but this loss has been offset by land shifting to
forest—mainly through the "soil bank," idle cropland, and pasture that reverted to woodland. Pine acreage has decreased. Most of the nonstocked land is still in the brushy stage of stand development.

About 270,000 cords of growing stock, including 95 million board feet of sawtimber, were cut from southwest Ozarks during 1958. This was more than one-fourth of all the timber cut in Missouri that year. About three-fourths of the cord volume harvested came from sawtimber-size trees. Most of the softwood cut came from trees less than 11 inches d.b.h., while approximately half of the hardwood cut came from trees 15 inches d.b.h., and larger.

The volume of timber that can be harvested annually during the next decade, while maintaining a balanced distribution of age classes and progressively improving the stocking of good trees, has been estimated.

The prospect for good quality timber is bleaker here than anywhere else in Missouri. Only 30 percent of the trees are suitable for future management. Forty percent of the trees are cull and another 30 percent should be harvested soon because they are too old, rough, or defective to manage for commercial products.

The kind of cutting practiced in the region at present is not conducive to sustained-yield timber production. The volume in small trees, which are not thinned when needed, continues to increase. Larger timber of preferred species is being cut at a faster rate than it is growing. As a result, the supply of high quality timber, which already is low, continues to decline. Unless this trend is reversed, local timber industries will face shortages of the kind of timber they have been accustomed to cutting. Only scientific timber management will guarantee the supply of timber expected to be needed in meeting future demand.


Of the total land area of 6,149,800 acres, more than 70 percent is classified as forest land. However, not all of this forest land can be called commercially productive. Commercial forest land in this region occupies 4,332,800 acres. If properly managed, this timber will lead to the establishment of stable wood-using industries and their accompanying financial benefits.

A comparison of the 1947-1959 data reveals that the commercial forest area has been reduced by 100,200 acres. A shift to non-commercial forest land accounted for 5 percent of the reduction. The major portion, 95,200 acres, is the net result of the conversion of forest to non-forest land. Approximately 168,700 acres changed from forest to non-forest use, while 73,500 acres changed from non-forest to forest.

Tree quality throughout the region is low. Only 47 percent of the trees are classified as crop and storage trees. The remaining 53 percent are poor-risk trees which, because of poor form or other defects, should be removed from the stand.

Another measure of the quality of the forest in the region is the grade of the
Almost 70 percent of the sawlog material in standing trees is classified as Tie and Timber grade. Another 22 percent is Grade 3 while only 8 percent is in Grades 1 and 2, the better classes. However, much of the low log quality is a result of size and not necessarily cull or defect. The timber of the Eastern Ozarks can be upgraded tremendously if, for the next decade or two, the sawtimber in the lower diameter classes is allowed to remain in the stand.

The forests of the Eastern Ozark Region can sustain a cut of about 780,000 cords including 150 million board feet of sawtimber annually for the next decade while improving the forests and increasing the growing stock. This cut amounts to approximately 63 percent of the total annual net growth and 3.6 percent of the total growing stock. It is about 49 percent of the sawtimber growth and 4.7 percent of the sawtimber volume.

Almost 50 percent of the cut would come from poletimber-size trees. This is small material for which only limited markets exist at present. Also, the sawtimber cut may be of lower average quality than that presently being cut. The extent to which these problems are met and the silvicultural goals of the desirable cut are achieved in the next decade may determine the economic well-being of forestry in this region.

This forest survey has measured and recorded the development of the timber resource of the Eastern Ozarks during the last 12 years. The survey has revealed deficiencies, areas in which more progress must be made if the Eastern Ozarks is to approach its full capability as a timber-producing region. Restocking idle land, increasing volume in present stands, removing the culls, improving quality, and attaining more complete fire protection are but part of the task set for the future. The opportunity for greater timber production in Eastern Ozarks is apparent.

**Forest Management**


This short study reports many of the characteristics of the typical Missouri Ozark small forest owner. Recorded are such facts as his occupation, age group, general residential area, tenure and size of forest land ownership. The author concludes that if the individuals he interviewed in Wayne County, Missouri, are typical of the Ozark region, managed timber production on small forests in the future is not likely to increase much. More than four-fifths of the owners in the study area do not intend to try actively to increase their timber production at present. But the author is encouraged by the tendency toward concentration of the larger “small” forest areas into the hands of a few owners who show interest in managing their land.

This is a non-technical bulletin covering the greatest single problem facing foresters in Missouri. Burning of the woods is a common practice in the Missouri Ozarks. Traditional belief remains that the woods should be burned yearly to make more grass, to kill chiggers and ticks, to drive out "wolves," and to keep down brush. This bulletin points out how such fires are harmful to timber, soil wildlife, and stream flow. It shows how fires are started, how they burn, and how they can be prevented and extinguished. The State Fire Protection Organization and the State Fire Laws are described as well as procedures for establishing local fire control organizations.


This research was initiated on an eight-year-old stand of Eastern Cottonwood (populus deltoldes) in the Du Pont State Forest at Ashburn, Missouri. This study reports on the results six years after the thinning treatments. Results showed the cubic-foot volume to be about the same on thinned and unthinned plots. However, the thinned plots yielded higher quality lumber at a reduced cost of harvest.

**PRODUCTION AND UTILIZATION**


This is a general report which reviews the forest and wood resources of Missouri, how to increase the yield and quality of the forests, and the value of improved forest management.


The forest area of Missouri in 1956 was 15.2 million acres or 39 percent of total land area. Practically all of this area is classified as commercial forest land. The Ozark Region consists of 10.1 million acres, 67 percent of the commercial
forest area. Ninety percent of the commercial forest area was privately owned, 9 percent federally owned and 1 percent state owned.

Approximately one-third of the gross board-feet volume in all sawtimber sized trees in the forest is in cull trees. This cull timber may be utilized to make charcoal. Blackjack oak is considered as normally not having commercial value, but is very desirable for charcoal. Under good management, Missouri's forest land could probably support five times the present volume of sawtimber.

Of the gross board-foot volume in trees that meet sawtimber specifications, approximately 12 percent are cull material. The cull trees must be removed to make room for trees of better quality before maximum productivity can be reached.

In some areas the receipts for materials salvaged from cull trees for charcoal wood, fuel wood, mine timbers or rough lumber for farm use may cover the costs of recommended improved cuttings. Less than one-third of a sawtimber tree finds its way into the final product as lumber. The cull and scrap wood remaining may be utilized to produce charcoal.

Wood used for pulp in paper manufacturing must be of high quality. After this high quality wood has been removed, the less desirable wood is suitable for charcoal. This practice leaves the best trees to develop for saw logs, while thinnings are used for all woods. The result is a profitable, efficient forestry program.

Missouri forests can never produce maximum returns until the inferior species and badly defective trees are removed and replaced by trees of more desirable grades. Relatively little progress can be made in removing inferior trees until profitable uses for them are developed. The proportion of less desirable materials now being utilized for products of low quality such as fuel wood, rough construction lumber, charcoal and mine timbers could be increased. Yields of charcoal from wood bark may be similar to, or possibly greater than, the amount recovered from the wood.


There are 18 wood preservation plants located in Missouri, as well as two additional plants just across the Mississippi River in Illinois. The two plants in Illinois are included in this directory because they own large acreages of timberlands in Missouri, they draw a good part of their raw material from Missouri, and because they play an important part in the conservation of Missouri forested lands. The Hennisen Wright Corporation is located at Granite City, Illinois, and the T. J. Moss Tie Company, whose treating plant is in Illinois, has its main offices in St. Louis, Missouri.

Complete data of the amount of wood processed with preservations in Missouri during 1963 are not available. However, the 18 plants reporting indicated that they treated over 7,500,000 cubic feet of wood products during 1963.

The Missouri wood preservation industry provided direct employment for more than 460 men in these plants.

This folder was published to advise Missouri woodland owners of financial and technical assistance available through the Agricultural Conservation Program for carrying out certain forestry practices.

Forestry practices that will qualify for A.C.P. Forestry Assistance in Missouri include: *Practice 9 (A-7)* Establishment of a stand of trees on farmland for purposes than the prevention of wind or water erosion.

This practice provides for tree planting of locally adapted species for general forestry purposes and also for direct seeding of shortleaf pine on adapted sites. All plantations must be protected from destructive fire and grazing. Plantings for Christmas trees, orchards, or ornamental purposes are not eligible.

Planting stock or pine seed should be ordered separately from the County Extension Director or Farm Forester.

Federal cost share rates are established by County A.S.C. Committees. Generally they are 50 percent or more of the average cost of completion of the practice. Cost sharing for replanting in the following year may be allowed for failures due to causes beyond the control of the participant.

*Practice 11 (B-10)*. Improvement of a Stand of Forest Trees on Farmland. This practice provides for improving permanent woodlands by girdling, cutting, or otherwise eliminating cull, diseased, or undesirable trees which are overtopped or crowding good trees. Thinning of over-crowded stands and pruning crop trees will also be considered as stand improvements. To qualify, the area must be adequately protected from destructive fire and grazing.

No Federal cost sharing will be allowed for areas from which merchantable products are harvested in the process of carrying out the practice. However, stand improvement work can follow or precede a timber harvest.

Cost share rates vary between counties. Rates are 50 percent or more of average costs of completing the practice.


This publication contains the complete minutes of the Governor's Conference on Wood-Plastic Irradiation held in Jefferson City, Missouri, and sponsored by the Missouri Division of Commerce and Industrial Development, the Missouri Conservation Commission, the University of Missouri, and the United States Forest Service in cooperation with the Southern Interstate Nuclear Board, an organization of 18 states located in the southeastern part of the United States (Missouri being the northernmost member). This organization was established under Public Law 87563 (1961) to enable the member states to regulate and control the use of fissionable materials.
The conference centers around the development of a wood-plastic material produced by the impregnation of wood with a liquid plastic chemical, a monomer, and then irradiating it with gamma rays from a cobalt source. The resulting product has all the aesthetic properties of wood with many of the desirable characteristics of plastic.


The fact that seeded trees survived and grew better than planted trees may be due partially to their better establishment since transplanting results in loss of some roots during planting. When more than one seedling develops in a spot, the chances are good that the spot will remain stocked. If seedlings that develop from a direct seeding can get by the critical first growing season, they will survive better and grow faster than planted seedlings the same age on areas where overstory hardwoods have been removed.


Since 1950, increasing numbers of Missourians have been planting evergreens for the production of Christmas trees. Results are ranging from abject failures to enthusiastic and mounting successes. The principal cause of failure has been the unrealistic attitude of some would-be growers. Their viewpoint of a Christmas tree operation was overly simplified: "Plant some trees, wait a few years, harvest the crop." This approach has led to a considerable number of unprotected and otherwise unmanaged plantations. Needless to say, such ventures are foredoomed to a disappointing end.

Individuals who study production techniques learn what species are most suited to their locality, what is a suitable planting site, and other necessary information and are now selling an annual crop of good trees.

The steady rise in population brings more customers into the market each year. The ratio of Christmas trees to people has narrowed. Americans have become more urbanized and relatively few are cutting the family tree. Moreover, there has been a further infusion of the Christmas tree tradition. In most homes the yuletide focal point has shifted from the no longer common family hearth to the family Christmas tree.

An important and steady trend of significance to the grower is the increase in the number of trees being sold from plantations. In 1962, plantations were yielding 38 percent of the nation's Christmas tree harvest. Natural stands of satisfactory quality are increasingly difficult to find. Production rates have kept pace with demand only through the cutting of vast numbers of low-grade trees. Thus, although there has been no shortage of trees as such, and local markets may be flooded some years, good trees are scarce.
From all indications, good trees will continue to be in short supply and will continue to move readily at premium prices. In a series of Missouri marketing tests conducted over a period of years, high-quality trees have consistently sold quickly. Average to poor trees were selling slowly, if at all, at about half price. The trees still on retail yards Christmas day are characteristically of low grade.

Quality has become the primary basis for pricing Christmas trees. Accordingly, the successful grower must gear his operation toward quality production. To do this, decisions in the over-all process must rest on an ability to evaluate traits that affect the grade of a Christmas tree. The Christmas tree grower, like the grower of any crop, must know the kind of product he is trying to produce.


This booklet describes experimentally proven methods for successful direct seeding of shortleaf pine in the Missouri Ozarks. The authors state that shortleaf pine stands can be established in the areas by sowing pine seed as a farmer sows oats and at only one-third to one-half the total cost of planting nursery-grown seedlings.


This bulletin presents the results of a study by the North Central Woodland Products Marketing Committee representing the 13 agricultural experiment stations and the Agricultural Research Service, U.S. Department of Agriculture. The purpose of the study was to find ways to utilize oak timber of low quality. The use of sawtimber-sized oak for paneling gave considerable promise, and is the subject addressed in this report.

**STATISTICS AND MISCELLANEOUS**


This report contains statistics relating to the timber resources of Missouri in 1959. The tables list the volume of growing stock and sawtimber on commercial forest land for the state and by counties. Volume of sawtimber is also listed by species for the state, subregions, and counties.
In a review of the statistics, the author listed the following facts: Missouri's 15 million acres of commercial forest land were supporting 58.6 million cords of growing stock in 1959. Hard hardwood species account for 49.1 million cords or 84 percent of this total. Soft hardwoods present another 10 percent, and softwoods the remainder.

Included in the 58.6 million cords of total growing stock are 12.1 billion board feet of sawlog material. The oaks, led by white oak and black oak, account for two-thirds of the state's sawtimber volume. Elms account for more than half of the soft hardwood sawtimber volume. Softwoods, mostly shortleaf pine, represent only 6 percent of the sawtimber total. Five individual species—white oak, black oak, post oak, northern red oak, and shortleaf pine—comprise 7.2 million board feet or three-fifths of Missouri's timber.

Though accounting for only 14 percent of the total land area in the state, the 14-county Eastern Ozarks Region contains 37 percent of the sawtimber. Timber volume per county in the Eastern Ozarks averages 1,540 thousand cords of total growing stock including 235 million board feet of sawtimber. In contrast to the Eastern Ozarks are the sparsely forested northern and southern western prairie areas which contain only 19 percent of the state's total growing stock and 25 percent of the sawtimber. The average prairie county contains 206 thousand cords of total growing stock which includes 58 million board feet of sawtimber.


This study was undertaken to develop models for economic analysis of selected land use alternatives commonly available to Dent County, Missouri, farmers and other landholders of small woodlands in the Ozark region. These uses were considered to be growing pine timber, converting oak to pine and converting oak to grass.

Analyses were made of a wide range of possible input-output combinations for each land use alternative. A Fortran 2-IBM 620 program was devised to determine the rate of return for the wide range of timber and grass input-output combinations presented in several tables and graphs which should cover all feasible input-output combinations for areas where similar timber and grass types occur.
Section V

Natural Resources

After reviewing the development and composition of the formations, the writer closes his review as follows:

"Oil production from the Kimmswick Limestone is associated with anticlinal structures which have thin limestone cover. Several such anticlinal structures, bearing promise for future petroleum production are described, mainly in northeastern Missouri and southeastern Iowa."


This publication is concerned with the common problems that beset the states which are substantially influenced by the Missouri River. Information is presented for each state relating to personal income, population changes, and employment in major occupational groups for all the states in the Missouri river basin.


This report is a collection of data on floods, flood frequency, elevation, and flood duration for Jefferson County. It is to be used as a guide for identifying areas that are subject to flooding. There is a section on each of the following: Glaize Creek, Dry Creek, Sandy Creek, Plattin Creek, Mississippi River, Rock Creek, Big River-Summer report, Big River-technical report, Meramec River-summer report, Meramec River-technical report, Joacham Creek, and Joacham Creek-technical appendix.

The technical reports are concerned with a more detailed description of the flood plain area, flood warning and forecasting services, flood fighting and emergency evacuation plans, average rain fall, typical storms, and guide lines to be used in flood plains for minimizing future flood damage.


This study was undertaken to determine demand for water fowl hunting op-
opportunities and income derived from water fowl hunting in the vicinity of the Swan Lake National Wildlife Refuge in Chariton County, Missouri, which harbors one of the largest concentrations of Canadian geese in the United States.

The study was divided into three major areas of inquiry:

(1) Determination of the amount of income generated from the water fowl hunting in the Swan Lake area;
(2) Analysis of the degree of water fowl hunting; and
(3) Determination of the degree to which fowl hunting benefits have been capitalized into land uses.

The largest single category of expenditures was for blind fees with farmers being the primary recipients. Restaurant purchases was the second largest category, followed by transportation expenditures. An additional $124,176 was spent annually by federal and state agencies and personnel in 1964. The total economic impact in the 1964 water fowl hunting season was slightly over $600,000.

The effort to determine the extent of capitalization of water fowl hunting benefits and land values was not successful. Maximum and minimum additional values to land surrounding the Swan Lake National Wildlife Refuge attributed to water fowl hunting was estimated to be $200 to $500 per acre; however, these findings were not verified by record in the courthouse.


This publication reports the existing law of Missouri related to water-use. The study upon which the report is based was limited to an investigation of the Missouri court decisions and general legislation affecting rights to use waters within the state.


This bulletin reports the procedures employed to acquire land and relocate people who lived in the Wappapello area in Wayne County, Missouri, and describes and measures the economic and social impact of the Wappapello Reservoir upon the immediate community.

Findings of the study included the following: (1) The people of the area did not receive adequate information about the plans for the reservoir; the result was difficulty in planning for modification of community organizations. (2) The condemnation procedure was costly in both time and money. (3) A large number of landowners expressed greater dissatisfaction with the method of land acquisition than with the final price received for their property. (4) Local people were not compensated for “disturbance costs.” (5) Opportunities for quick re-
location of landowners were hampered by a long delay in receipt of payment, a steady rise in land prices, and an abrupt increase in number of buyers of land around the immediate Wappapello area. (6) Relocation of the urban sector was handled rather efficiently. (7) The removal of privately-owned lands from tax rolls cut school and county funds. (8) There was a considerable increase in the use of the reservoir for recreation.


The Meramec River Basin is located to the southwest of the St. Louis metropolitan area and includes all or part of 15 counties covering 3,980 square miles.

The purpose of this report is threefold: (1) to review the plans proposed for the Meramec River Basin; (2) to identify some of the problems, needs, and opportunities associated with the development of the water resources in the Basin; and (3) to discuss alternative courses of action insofar as possible, on the problems that require action or decisions by public bodies.

The Corps of Engineers revised its plans during 1960-64 with its final recommendations including five reservoirs and 19 angler-use sites in the Meramec Basin. These projects were to be designed “to meet the immediate and near future needs of the basin for flood control, recreation, water supply, water quantity control, and fish and wildlife conservation.”

Other agencies which presented development plans for resources in the Meramec Basin included the United States Forest Service, the United States Department of Agriculture, and the Missouri Conservation Department. The Forest Service was concerned because any development would have its impact on the Clark National Forest which covers one-sixth of the Basin area.

The U.S.D.A. submitted a plan that would help improve agriculture in the development area. The Department concluded that small structures were needed on headwater and tributary streams and recommended that 60 reservoirs be built. The Missouri Conservation Department in surveying recreational needs found the St. Louis metropolitan area to be in need of 30,000 additional acres of recreational lands by 1980. They concluded that the development of the Meramec Basin offered the greatest recreational potential for the St. Louis area. Although flood control and water supply are important, recreation occupies the major role in potential use and benefits. The impact of recreational development on the area would be large because more than two million people live within and just outside the Basin.

Construction of reservoirs and subsequent development of the area would provide opportunities, but also create problems for individuals, special districts, municipalities, county and state governments. In addition, a portion of the construction costs and the annual operation and maintenance costs of dams and other structures must be assumed by responsible *non-federal* groups. Thus, a major
problem of developing the water resources of the Meramec Basin concerns the ability of the Basin to finance its share of the projects. Private organizations and municipal, county, and state governments were evaluated in an effort to ascertain their capabilities of financing projects in the Basin.

A second challenging problem is the establishment of policies that will encourage orderly and desirable development of areas near the reservoirs; that is, commercial, residential, and private recreational developments over a wide area, as well as provide necessary roads, police protection, public services and utilities, and prevent water pollution.

At the time different development plans were evaluated, few means were available for formal control. The Corps has no means of controlling the use of privately owned land outside that which they have acquired. The Soil Conservation Service has no control over the land around the impoundments built under its program. The Forest Service would control the land around impoundments built on Forest Service land but has no authority over nearby privately owned land. The capabilities of private organizations and local and state governments to effectively influence the orderly development of the area were examined, also.


This publication is a detailed analysis of the AWRBIAC experience. The area includes the entire state of Oklahoma, most of Arkansas, and parts of Colorado, Kansas, Louisiana, Missouri, New Mexico, and Texas. The core problem of the AWRBIAC was a lack of a well-defined accepted concept of comprehensive river basin planning. Some of the limitations of the plan and the achievements of the study are pointed out. Two reasons are given for the ineffective organizational structure of the AWRBIAC. The first was the nature of the duties and responsibilities given to the participants by law. Second was the full protection of the vested interests of each organization participating.

**WATER**


The Spring River Watershed area covers approximately 1,336,900 acres in eight counties of Missouri: Barton, Dale, Jasper, Lawrence, Newton, Barry, Christian,
and Stone. Data were obtained from field observation, geological service technicians, soil service maps, U.S. Geological Survey maps, and U.S. Weather Bureau records.

The article consists primarily of a description of the topography of the watershed; soil types in the watershed; economic data for the area, consisting of the various types of crops and livestock grown; soil and water problems in the area; and programs needed for improvement of the area.

**MINERAL**


This dissertation describes 51 minerals found in tri-state ores and analyzes the trace element distribution of silver in galena, and cadmium, gallium, gormannium, and indium in sphalerite.


This reference is valuable because of its historical significance to the mining industry of Missouri.

In the southeast district of Missouri, the average grade of the crude ores has gradually decreased as improved mining and smelting methods have lowered production costs, making it feasible to work lower grade or marginal ore bodies. At present, the average lead content of the ore is probably less than 3 percent. Practically the entire production at present comes from the disseminated deposits in the lower part of the Bonne Terre formation.

At present the bulk of Missouri iron ore comes from Iron Mountain which has produced a total of more than 7,000,000 tons. The brown iron ore or limonite deposits on the southeast and south slopes of the Ozark uplift are also being utilized, but the tonnage produced is relatively small. The bedded specular hematite deposits on Pilot Knob have been exhausted, and no production of hematite from the filled sinks has been reported for several years.

For many years an appreciable quantity of zinc concentrates has been recovered from the lead concentrates by selective flotation. Zinc is not present in recoverable quantity in all the ore, and only the output from certain sections of the mines is treated to recover it.

Cadmium compounds, especially in sulphide greenockite, are commonly associated with ores of zinc and lead. Cadmium is recovered as a by-product from
the processing of lead-zinc ore at the St. Joseph Lead Company smelter at Herculeanum, Missouri. The crude ore contains only a small fraction of 1 percent of cadmium. No statistics on cadmium production in Missouri are available.

Missouri is not a large producer of copper, but in 1950 nearly 3,000 tons of copper were recovered in the refining of copper-bearing lead ore from the Lead Belt.

A report on the manganese deposits of Missouri by Grawe was published in 1943. Also references are made to various locations of manganese oxide minerals in the reports of the State Geological Survey.

Along with the manganiferous chert breccias, nodules of manganese oxides occur in the residual clay. Replacements of volcanic tuffs by manganese oxides and vein deposits in the porphyry are known in Iron and Reynolds counties. A vein deposit at Thorny Mountain has been worked at intervals since 1940.

The vein ore is of good quality but has to be hand sorted to avoid excessive silica content. The chert breccia deposits are variable but as a rule do not carry more than 15 to 20 percent manganese. In addition they contain from a trace to as much as 0.74 percent cobalt. The tuff deposits are small and probably of no commercial importance. Total production in the state has been about 2,700 tons valued at $50,000.

Although no deposits of this metal have ever been found, Missouri has produced nearly 7,000,000 ounces of silver as a by-product of lead refining. The pig lead produced at the smelter contains an average of one-half ounce of silver per ton and to produce pure lead, this must be removed even though the cost of removal is actually greater than the value of silver.

Tungsten minerals occur sparingly in a quartz-pegmatite vein at the Einstein Mine, southwest of Fredericktown, in Madison County. The mine was originally worked for the silver-bearing galena which occurred in the same vein, but as a silver mine it never was profitable. When the price of tungsten increased, the old dump at the Einstein Mine was reworked from 1916 to 1918. Since then the old dump at the Apex Mines nearby has also been reworked, and attempts have been made to reopen the old shafts. About 125 tons of tungsten concentrates valued at $160,000 have been produced.


Various aspects of sulfur production and distribution in the seven above-mentioned states are discussed. The authors predict a favorable outlook for sulfur during the next decade, but this outlook is somewhat clouded by what the authors call "short-run upheavals of economic factors."
Statistics and Miscellaneous


This bibliography, which is concerned with literature pertaining to the geology of Missouri, lists published and unpublished works which have appeared since 1945. It also contains several titles which were not included in the cumulative bibliography published by the survey in 1945. This volume supplements and expands the bibliography edited and published under Clark’s direction in 1945 as Volume 31.
Section VI

Human Resources
OCCUPATION CHARACTERISTICS


This publication lists areas of substantial unemployment by state and indicates which federal programs each area is eligible for, such as public works grants under Title I of that act. Whether unemployment is persistent or not is also indicated.


This study attempted to learn more about the background and community participation of physicians who chose to practice in non-metropolitan areas. An underlying assumption was that decisions to practice in rural areas were somehow related to past experiences. In converting "past experience" to researchable dimensions, two main topics were considered: family occupational background and the place history of physicians. Data were obtained from personal interviews with physicians in a 20-county non-metropolitan area and from physicians in a metropolitan center. The non-metropolitan area included ten counties north of the Missouri River and ten counties south of the Missouri River.

The fathers of metropolitan physicians were more likely to have lower status white collar occupations or blue collar occupations than were the fathers of rural medical doctors. Rural doctors had predominately rural backgrounds and metropolitan doctors had predominately urban locations during their youth; young men from rural areas entering the medical profession often went to the city for their medical training. Both rural and metropolitan doctors participated equally in professional organizations. Rural doctors were more deeply involved in community life than metropolitan physicians.


Population and per capita income projections are given to 1976. Employment projections by industry and state are also given to 1976.

ECONOMIC CHARACTERISTICS AND TRAITS OF BUSINESS MANAGEMENT

Discussion and analysis of socio-economic characteristics related to poverty, e.g., income per household, unemployment, formal education completed, age of head of household, ratio of racial groups, unemployed and employed by occupations are presented. Statistical tables presented include poverty index of Missouri counties in 1960, occupation and median earnings, occupations of employed males in Missouri, 1960.


This paper inquires into the causes of population loss from the non-metropolitan areas of the state, along with the causes in the increases of population in some of the more urban areas. The hypothesis is that changes in the population of counties of Missouri are primarily related to 1) the amount of absolute increase in the county's median family income and 2) the proportion of families in a county whose incomes exceed the minimum family income required for a reasonably respectable family existence.

The study concludes that there is a high degree of correlation between the degree of family economic welfare, absolute change in median family income and population change. Also, the idea that any type of industry (even low wage paying ones) will stop population out-migration is found to be invalid.


This report is published monthly.

It includes statistical information on labor force, employment, unemployment, turnover, hours, earnings, area trends, and county trends.

The findings of the September, 1964, monthly report included in the general discussion are: 1) Civilian labor experienced a slight decrease from mid-July, but is still significantly higher than one year ago; 2) Average hours for manufacturing production workers increased to 40.6 per week for month of July; 3) U.S. Department of Labor listed 14 areas of Missouri as having substantial unemployment in August.


Various articles included discuss such topics as: unemployment compensation—Missouri and the nation; hiring the handicapped; employment trends; non-agricultural employment; diploma time is hiring time; unemployment insurance; women workers; demand exceeds supply; taxable payroll; and labor getting tight.

The author projects numbers of service workers in the state by 1970 and compares this with the number being trained in 14 different occupational groups. The need for service training and the need for awareness of this fact by counselors and vocational educators is stressed.


The purpose of this report was to make public the finding of a survey conducted to discover the number, location and needs of persons who would be eligible for benefits under the Economic Opportunity Act of 1964 and succeeding amendments.

The geographic area covered by the West Central Missouri Rural Development Corporation includes the counties of Bates, Cedar, Cass, Henry, St. Clair, and Vernon. The 1960 census indicated that 102,979 persons lived in this area. The survey revealed that 25,122 persons live on a standard below that established by the Economic Opportunity Act of 1964 as the poverty criteria. Of this number, 5,569 were children under age 15; 2,548 were youths between ages 14 and 24; 11,437 were in the vital, productive age range 25-64; and 5,568 were over 65 years of age.

These wide ranges in ages within the poverty group indicate that the cause and effect of poverty—lack of education, poor health, lack of skills, unemployment, underemployment, lack of work opportunities and domestic problems—are taking their heaviest toll among those who have the greatest productive possibilities, and who must bear the responsibility of correcting the situation. It also indicates the wide variety of programs necessary to meet the needs of the various age groups.

OTHER POPULATION CHARACTERISTICS: ATTRIBUTES, FAMILY SIZE, OTHER STATISTICS


Data presented in this article indicate that a major highway may have considerable influence upon population changes in rural areas. However, it should be emphasized that highways are only one of several factors which influence population.
This bulletin examines where the people who are natives of Missouri have gone, that is, where they were residing in 1960. The majority of the movements of the people have been westward with the exception of the states bordering Missouri. Movement into the state has been basically a northern movement from the southern and southeastern states except Florida. An important result of this movement is the exporting of resources. The people moving in have lower education than those moving out.


The purpose of this report is to provide data for people who do not have the U.S. Census material available but desire to know general changes that have occurred in Missouri's population. The 1940 and 1960 population counts are used considerably.

The first section of this bulletin presents the general social and demographic changes that occurred in Missouri between 1940 and 1960. The data are presented for the state and contrasted with national figures. In the second section, the same data are examined for eight "core" counties to indicate changes that have accrued across the state. The data, including birth rates, death rates, age distributions, sex ratios and educational achievements are examined for 1940 and 1960 and contrasted with state data. The eight counties were selected because they approximated the average social and economic conditions. They were: Atchison, Caldwell, Knox, Henry, Webster, Warren, Ripley and Mississippi.

A list of place names, counties and population by decades is presented. The source of the data was the United States Census of Population for each decade from 1890 to 1960.


In the past decades, Missouri has fallen behind the nation's rate of increase in population. In 1960, Missouri was the 13th most populous state in the U.S., in 1950—11th, 1940—10th, 1930—9th, and it was the 5th in 1900. Slower growth
rates for Missouri than for the nation are indicated in the projections to 1980.

Urbanization will continue. The nine highly urbanized counties adjoining St. Louis and Kansas City constitute 59 percent of the total population of the state; this percentage should rise in the future as the proportion of people in urbanized areas continues to increase. Population projection figures show that these urbanized counties may be expected to increase 30 percent over the next 20 years, while the balance of the state may show only an 18 percent gain.

A belt of counties across Missouri from St. Louis to Kansas City will account for nearly 80 percent of the projected state population by 1980.

STATISTICS AND MISCELLANEOUS


This is an annual report of statistical data on the state of Missouri; primary headings of the table of contents are:
1. Births, deaths, infant deaths
2. Accidents
3. Deaths, infant deaths, maternal deaths
4. Marriages
5. Divorces


These data are published annually. Statistics are provided on juvenile delinquency, dependency and neglect, adoptions, and special proceeding cases—functions of the juvenile courts of Missouri. Statistics contained in these reports show the extent to which the juvenile courts are utilized within a given area.


This report is published every two years with separate data given for each year. Statistics on manufacturing are broken down for cities and counties of Missouri as of a specific year. Topics for which statistics are provided include health and safety of employees, employment of minors, employment agencies, salaries, hours of female employees, number of employees and proprietors of specific industries and counties.

Statistics are broken down for each county of Missouri on population trends, age distribution, employment, manufacturers, finance, housing units, local governments, assessed valuation, income characteristics, transportation, education, retail trade, wholesale trade, social characteristics, and economic characteristics in this publication.
Section VII

Public Education and Vocational Training

The purposes included 1) determining the individual who assumes responsibility for recruitment and selection of potential employees in Missouri Public School Districts; 2) determining practices used in (1); 3) making recommendations for improvement of recruitment and selection programs. A normative survey technique, involving pre-arranged interviews with forty-seven selected school superintendents, was utilized. Conclusions included 1) some variations were found in practices of the administrators; 2) all administrators regarded recruitment and selection as a personal responsibility; 3) differences in school size were found to be irrelevant.


This is a discussion of integration from a historical and also a comparative viewpoint. The various events leading to specific relevant court rulings and comparison of school populations of various districts are discussed. Although discussion concerns the entire state, there is much focus on schools in the St. Louis area. These are the conclusions: 1) the Board of Education in August, 1963, announced a general policy of maximum racial desegregation so long as no destruction occurred to the school as a major service unit of its neighborhood; 2) Missouri's problems and limited success in integration are similar to those of other border states.


The purpose of this study was to predict the need for teachers in the St. Louis Public Schools for 1963-1964. A descriptive method was used, with data taken from records and reports of the Board of Education, Bureau of Vital Statistics, City Plan Commission, St. Louis Public School System, etc. The conclusions are: 1) the percentage of teachers retiring was higher for secondary than for elementary levels; 2) teacher resignation was the main reason for termination of services; 3) the secondary level will be most affected by death and retirement in the near future. Recommendations included the establishment of a state-wide cooperative teacher recruitment program and continuous study of future teacher needs of St. Louis Public Schools.

In addition to the purpose stated in the title, this study compares high schools of graduating classes over 100 to those below 100. Records of Missouri State Department of Education and United States Census reports were utilized. A questionnaire was submitted to the 285 high schools in Missouri with enrollments of over 200. It was concluded that 1) larger high schools provided for the academically gifted, vocationally oriented, and slow learners to a greater degree than those which failed to meet Conant’s criterion for size and 2) that the combination of new high schools in Missouri has not been progressing at a rapid enough pace to insure proper size of such for the youth of Missouri by 1974. It was recommended that those public high schools not large enough for a minimum graduating class of 100 investigate the possibility of sending their students to larger schools of adjacent counties.


This study attempts to obtain objective descriptions of new public school teachers employed in 1958-59 and descriptions of the remainder of the population of teachers employed 1958-59 and to compare the former with the total population of such. Sources of data include IBM teacher data cards, annual Application for Classification of the State Department of Education, and IBM cards of the Public School Retirement System of Missouri. It was concluded that: 1) male teachers in Missouri are generally better qualified and prepared than female teachers; 2) new male teachers are better qualified and prepared than those already in the profession; 3) a minimum of 1 percent more teaching jobs will be available annually to new teachers in the forthcoming ten years; 4) salaries of over one-half of the teachers of Missouri are below those suggested by Missouri State Teachers’ Association; 5) deficient planning for the bachelor’s and master’s degrees has rested in college and university guidance programs.


This is a discussion of professional negotiation in the state of Missouri as
it involves "recognition, written procedures, plus a provision in writing to resolve a disagreement between teachers' representatives and boards of education," (page 14). Significant points of the study include 1) professional negotiation, as herein defined, has not been practiced by Missouri school districts; 2) seven Missouri school districts have recognized a local teachers' organization to represent the professional staff in regard to written school board policy; 3) many school districts with high school enrollments of over 150 have failed to officially recognize the local teachers' organizations in matters of mutual concern; 4) the role of school superintendents in teacher-board relationships is uncertain; 5) in school districts with formal statements of teacher-board relationships, the superintendent pursued a role of close cooperation with the teacher; 6) the most common approach to developing proposals or recommendations by teachers was for teacher committees of the specific district to present such to the superintendent of the school, who would then present it to the board of education. It was recommended that those Missouri school districts planning to adopt a formal policy of teacher-board relationships make an objective analysis of all alternatives, including that of professional negotiation.


The past enrollments of schools were studied to predict trends in the enrollment of grades one and two in the future. Survival ratio and incidence of exceptional children were among the measures utilized.

The significant problem raised was: How many special teachers will be needed in the public schools in Missouri during the period 1960-61 through 1970-71 for the mentally retarded, the deaf, the speech defective, the blind, and the crippled?

Significant conclusions reached were enrollments will increase about 1 to 1½ percent per year; the total enrollment in the public schools of Missouri will increase approximately 111,000 during the period of study; more children are in need of special education services. In 1970-71, there will be about 11,000 more children who will need such services than in 1960-61. Approximately 300 more special teachers will be needed during the 1970-71 school year.


The purpose of this study was to ascertain the strengths and weaknesses of various organizational patterns in the administration of instruction for 20 Missouri school districts. The method included a survey of pertinent literature, structured interviews with the chief school officer of each district, and questionnaires sent to teachers. Conclusions indicate that 1) working relationships among posi-
tions within school districts are not specified in the Missouri school districts studied; 2) there are better communications of school district needs, policies, and procedures to the public than within the school system; 3) there is no uniformity in the assignment of duties and districts; 4) the performance of department heads contributes more to administration than to curriculum development and improvement of instruction.


Questionnaires were mailed to male high school students in Missouri. The sample was chosen from three small towns.

One purpose of the study was to determine how to set up the design for a state-wide study investigating occupational and geographical distribution of Missouri male high school students. The ultimate purpose was to supply data for a study of employment opportunities for redundant rural population in Missouri.

The study provides some insight into the patterns of occupational and geographical distribution which might be found in a state-wide study. It gives detailed bibliographical material for use in preparation for additional research in this field. In addition, it provides a vehicle for research in occupational and geographical mobility which gives a depth in time not ordinarily found in such studies.


The purpose of this study was to identify administrative conditions involved in the use of specific community resources for instructional purpose and to determine its relationship to the utilization of such resources by teachers working under these conditions. A descriptive survey was used with data obtained by means of structured interviews with superintendents and principals in 15 selected school districts. The findings indicated that 1) encouragement by school officials is indirect in regard to the use of community resources rather than through specific policies or procedures; 2) lack of certain school facilities and equipment is not a limiting factor; 3) skills for utilization of such resources are inadequately emphasized during professional training for teachers.


This is a presentation and discussion of policies and procedures, which became effective in July, 1961, in the area of teacher certification in Missouri. The purpose of the procedures discussed is to facilitate the certification of teachers and reduce, in number, the types of teaching certificates issued.
The proposed changes are: 1) the immediate elimination of all two and five-year administrative certificates; 2) as of July, 1961, all certificates will be issued through the individual college; 3) colleges should recommend issue of extended certificates to individuals possessing 15-hours minimum in subject matter field— if the applicant qualifies; 4) for a "life elementary" certificate, three years of experience is no longer required for those holding a degree.

VOCATIONAL TRAINING


Information forms were mailed to 50 state directors of vocational education. Another information form was sent to 465 local directors of area vocational-technical schools and programs in 42 states.

The major problem raised was this: What are the conditions, principles, and practices under which area vocational-technical programs have been established and operated in the United States and how do these findings apply to Missouri? Significant conclusions reached were these:

1) A study should be made of the employment opportunities, employer support, student interest, and voter approval when establishing a program;
2) The program should be integrated with a junior college if there is one nearby;
3) The three main problems are financing, building space, and securing qualified teachers;
4) A qualified director should handle administrative policy;
5) State legislation should allow district changes for some pupils who wish to attend;
6) In Missouri, 22 areas could be served by a vocational-technical program within a junior college.


The purpose of this study was to compare the probable supply of and demand for technicians in Missouri from 1960 through 1970 and to interpret the implications of these findings for the state’s program of vocational-technical education data obtained from The Missouri Division of Employment Security, National Science Foundation, Bureau of Census, Department of Labor, Missouri State Department of Education, American Medical Association, and information forms sent to a sample of industrial firms in the state.
Employment opportunities for technicians in Missouri may be expected to continue at a high level throughout the decade.

In-service technical training is needed in most of Missouri's industries. The imbalance between pre-employment technical training programs and the technical occupations found in the state is sufficient to warrant considerable expansion of the technical curriculums in the public schools in the state.


The purpose of this study was to determine the status of industrial arts programs and industrial arts teachers in public schools with implications for developing such a program at Central Missouri State College. Records of the Missouri State Department of Education and information forms from 633 industrial arts secondary school teachers of Missouri provided the majority of the data. The conclusions were as follows: 1) there is much variation in such programs in Missouri public schools; 2) community and school support for such is strong; 3) a more adequate and better balanced program is needed; 4) there is need for standardization and updating of the contents of industrial arts courses. It was recommended that Missouri State certification requirements for such teachers be examined and revised.

Higher Education


This study is a survey of selective admission and retention policies and practices of state-supported institutions in Missouri. Data were secured from information forms sent to the registrars of the eight state-supported institutions of Missouri, to those in states adjacent to Missouri, and to specific state-supported institutions throughout the United States.

The findings indicate that: 1) selective admission policies are found in all state-supported institutions of higher education in Missouri; 2) six of the eight institutions studied used a program of selective retention; 3) reasons of withdrawal were similar to those found in nation-wide studies; 4) admission and retention policies of non-Missouri state-supported institutions were more diverse than those of Missouri institutions; 5) interest existed in Missouri state institutions for the establishment of a basic grading system; 6) all institutions have or favor adoption of "persuasive counseling" in admission program; 7) the need for
a uniform basic admission and retention policy is recognized by a majority of the institutions of Missouri.


Subjects of this study were taken from an area 40 miles either side of Highway 40 from Kansas City to St. Louis. Only those within 40 miles of a college were used. A sample of 868 was obtained. Questionnaires were sent to parents of the subjects to learn the amount of federal income tax paid by the parents which was then used as an index of financial ability. Data were also obtained from Missouri Statewide Testing Service and from the high schools attended by the subjects.

The intent of this study was to ascertain the relationships of family tax-paying power to the college-going behavior of 1962 Missouri high school graduates in two ability groups. Other selected variables (sex, ability, parental education) were also investigated.

Family financial power appeared to be a significant factor in college attendance when only sex and ability were controlled. However, when other factors related to college attendance were considered, the importance of financial power as a decisive factor was substantially reduced.

**ADULT EDUCATION**


The purpose of this report is to bring to the attention of management, in the process of expanding or relocating their plant facilities, certain details in connection with securing trained workers under state and federal programs in Missouri. There are two methods of training industrial workers in operation in Missouri: (1) the Manpower Development Training Act system operated by the Missouri Division of Employment Security; and (2) the Vocational Education system operated by the Missouri Department of Education.

The primary difference between the two systems is that the Manpower Development Training Act System is initiated in response to an economically depressed labor situation, while the Vocational Education Program is identified as a basic part of a high school or post-high school curriculum. The Manpower Development Training Act System is directed toward unemployment and underemployment, incorporates on-the-job training as an important part of the overall program, and is 100 percent federally financed. The institutional training program cannot be set up for a single manufacturer unless the needs of the manufacturer are sufficient in absolute numbers of workers and there is unemployment in the
area of workers that could be trained; then the "local need" would justify an application to either the local school system or the Office of Employment Security.

Vocational Education Programs in Missouri can be set up for local individual firms and are known as "type C" programs. Type C training programs under the Vocational Education System allow federal financing only up to 75 percent of total training expense. The remaining 25 percent of training costs comes from local sources. The Vocational Education Training Program can be conducted by the local high school, a junior college, or a private vocational education school.

This report describes the procedures necessary for establishing either training method on the local level and lists the schools where such programs were in operation in 1966.


In 1963 a bench-mark study was made in the Carr-Square Housing Development to provide information for program determination and adjustment, and a base for evaluation of the home economics extension program. In 1966 a second study was made to serve as a base for program adjustment, evaluation of accomplishments of the program, and to determine the methods most effective with given segments of the population. This report is the result of the 1966 survey made in the public housing developments of the central city of St. Louis, Missouri.

A relatively small core of extension workers was assigned to serve the central city of St. Louis with an educational program. Under such circumstances the program personnel need to be aware of two variables: (1) the most effective means of making the population aware that such a program is available; and (2) the time span necessary to bring about acceptance of the program and, finally, desirable changes in the population.

The evaluation study indicated that much work remains to be done in making the population aware of the program. There were many acknowledgments by the homemakers that they had seen, heard, and used information from the program. However, when asked the source of information, many replied "my own idea" or "from my experience." Even 35 percent of those who had attended classes gave this response. This may be "protective coloring" for many in a population which feels itself looked down upon—they may be very reluctant to admit that they learned what now seems to be common knowledge (once learned) or simply that they did not know or could not remember.

Data available indicate that small neighborhood group meetings are most likely to be effective with this population for certain phases of the program. Such meetings supported by literature suited to the educational level of the homemakers will reach those who can be induced to attend gatherings of some kind in which selected kinds of information can be taught directly. Data also indicate that all phases of the program need to be approached through mass media. This media will strengthen the educational effort made in meetings with persons who
will attend, and it will reach a considerable proportion of the population who
will not attend meetings.

Homemakers at a very low educational and/or economic level will need in­
dividual attention to bring them to the level where they may become active par­
ticipants in an educational program. This will require development of a large
body of non-professional workers, whether they are recognized by homemakers
as "neighbors and friends," non-professional aides, local leaders, etc. The avail­
ability of such help will determine largely the time span necessary to create aware­
ness in these homemakers of a program in densely populated areas such as the
central city of St. Louis. Trained professional workers to carry out programs of
this kind in the major cities of the country are not available; they will have to
be supplemented by non-professional workers if a change is to be brought about
in densely populated areas in the foreseeable future.

The elderly (60 years of age and over) need help; however, an educational
program is less likely to improve their circumstances than material assistance. In
addition, since resources for an educational program are scarce, it seems more
justifiable to use them for improving circumstances of families with growing
children who will be able to utilize the education to a greater advantage. Tie-ins
should be made with other programs in the area which will stress job training in
order to upgrade occupations to enable wage earners to earn enough to support
their families under present social and economic conditions.

STATISTICS AND MISCELLANEOUS

Greenfield, William E., et. al., Mississippi County Manpower Development,
An Experimental Demonstration Project (July 1, 1965-December 31, 1966).
Final Report on the Mississippi County Manpower Development Project.
United States Department of Labor and University of Missouri, Extension

The adoption of new technology by Missouri farmers has caused numerous
adjustment problems in the rural communities of the state, particularly with re­
spect to the labor market. Mississippi County in the Missouri Delta represented
an area where unemployment and underemployment were major problems. Al­
mot 700 families out of 4,900 in the county reported an income of less than
$1,000 in 1959. About 300 families were on general relief in 1965. About 60 per­
cent of the rural population over 25 years of age had completed less than eight
years of schooling.

With the definite need for an assistance program designed to serve the low
income workers in a rural setting, an experiment and demonstration project was
set up with two major purposes: (1) to demonstrate new methods of identifying
and describing the unemployed and underemployed rural families, and (2) to
demonstrate methods whereby the low income rural persons might be successfully enrolled in training under the Manpower Development and Training Act.

This project became a part of the educational program sponsored by the University of Missouri Extension Council of Mississippi County. The council in turn appointed an advisory committee composed predominantly of middle income persons with its main purpose to serve in an advisory capacity to the project staff. The advisory committee also helped to create an awareness of the program throughout the county. The first objective of the program was to contact and identify the "hard core" unemployed and underemployed rural people. The identification was accomplished primarily by the use of lay interviewers hired by the project to conduct a personal house-to-house canvas of pre-determined areas of the county. The interviewers were given the following criteria as guide lines to use in identifying the target group within their assigned geographic areas of responsibility:

1) unemployed or underemployed head of household,
2) unemployed or underemployed single person, 22 years or older,
3) less than nine years of school completed, and
4) less than $1,200 work income per year.

A major problem apparent to lay interviewers and professional staff members was the difficulty encountered in securing accurate data from the target group. The two questions causing the most trouble were those related to work experience and income. It was believed that many did not actually have this information and that others gave a response which they thought would help their eligibility.

In general, it was felt that lay interviewers from the low income group were able to function satisfactorily in the role of interviewers. The project demonstrated that people within the target group can be motivated for training in institutional and on-the-job training programs. Furthermore, these people can be motivated to participate in training programs without payment.

The on-the-job training (OJT) program as outlined in the manpower training contract was not an effective means of providing rural employers with trained labor. It does not fit rural areas unless there is a population center and the associated non-farm jobs, within a short commuting distance. Many of the underemployed and unemployed agricultural workers were unable to move to employment for various reasons outlined in this report. Economic forces are major obstacles in implementing OJT programs in strictly rural areas. Surplus labor exerts downward pressure on wages. Consequently, it is difficult, if not impossible, to locate jobs either on or off farms which adhere to the hourly wages and overtime pay provisions of the OJT contract.

Two procedures used in the home economics training program were group meetings and individual training. The group meeting approach did not prove satisfactory because of transportation and other problems. Individual home visits were a successful method for training homemakers in the target group. Indivi-
dual training should be done prior to any attempt at group meetings. As rapport is established with the people, group training may be satisfactory as a method of training.


This statistical report is published annually. Its table of contents is as follows:
- Report of Superintendent—
  - Comparative Statistics
  - Taxation for School Purposes
  - Report by School Officers
  - School Records, Registers, Etc.
  - School Funds and School Lands
  - Report of School Fund
- Report from Various State Institutions
  - Report of Board of Curators
  - Report of Missouri Institution for the Education of the Blind
  - Report of Institution of the Deaf and Dumb
- Reports from County Superintendents
- Statistical Tables
- County Statistics
- Abstracts from County Superintendents’ and County Clerks’ Reports.
- Name and Post-Office Address of County Superintendents.
Section VIII

Community Facilities and Services
CHURCHES


A sample of several contiguous townships in six selected areas deemed typical of rural Missouri was taken to study spatial relationships, attendance, village business services, and lay leadership. Geographic areas of concern in this study were northwest Missouri, northeast Missouri, Plains area, Ozark area, southeast Missouri, and the St. Louis rural-urban fringe area.

Findings include the following:
1) Attendance rates decline for both church-type and sect-type groups as one proceeds from open country to large village.
2) Approximately one out of five people of rural Missouri attends Sunday school on any given Sunday.
3) Of the 919 church leaders residing in the open country, 63.7 percent held a position in an open-country church.
4) A greater proportion of men than women participate in both church and non-church leadership positions.


A sample of the total adult rural population of Missouri (not merely church members) was taken to determine the attitudes and opinions of rural people concerning churches and clergymen. Attempts were made to compare the actual situation in rural Missouri with the preferences of rural people in regard to churches and clergymen.

Church-type respondents consistently demonstrated different opinions more than sect-type respondents. Recent and/or regular attendance at Sunday worship services did not alter the aforementioned fact. There was found to be considerable consensus among all respondents, whether church-type or sect-type, and member or non-member, in opinions concerning rural churches and clergymen. Investigation findings were strongly influenced by the proportions of church-type and sect-type groups.

HEALTH FACILITIES

Hassinger, Edward W., *What's Happening to Rural Doctors and Health Facilities*. Rural Health Series No. 21, Agricultural Experiment Station Bul-
The study encompassed 20 counties of Missouri of which ten are in the northern section of the state and ten are south of the Missouri River. The purpose was to determine the situation at certain points in time and also to observe changes that have taken place through time.

The findings were as follows:
1) Most of the losses of physicians occurred from either death or retirement rather than from movement out of the area; 2) future losses of doctors of osteopathy and also dentists are expected due to death and retirement; 3) over time there has not been a movement of medical doctors from smaller to larger towns within the area, but those entering the area are more likely to locate in large towns; 4) osteopathic doctors were not as likely as medical doctors to be located in the largest towns in the counties; 5) dentists were highly concentrated in the 20 largest centers of the respective counties; 6) only three of the 20 counties had county public health departments; 7) hospitals are playing an increasing role in the maintenance of health.


This is a study of the local public health nurse of Missouri within the context of the social structure in which she works. Data are presented to show the norms of such individuals to be intermediate between the two aforementioned systems. Data were obtained from local public health nurses in non-metropolitan counties of Missouri, county court members in counties with local nurses, board of trustee members in non-metropolitan areas, physicians, the population of selected counties, and supervisory personnel in the State Division of Health.

The findings included the following: 1) the local public health nurse was found to encompass norms intermediate to local and central positions; 2) the aim of such individuals may be to bring normative content of positions closer together; 3) incumbents of linking position can better operate in such a role when there is no complete identification with either position.


This is a study of changes in distribution of professional health services in Missouri, including that of medical doctors, doctors of osteopathy, dentists, general hospital beds, and medical service centers. Data were obtained from relevant
issues of the *American Medical Dictionary*, *American Dental Dictionary*, *Directory of Osteopathic Physicians*, *Hospital Directory of the Division of Health of Missouri*, *Health Manpower Source Book*, etc. Findings include: 1) there is much interdependence of medical service centers; 2) specialization in medical practice is one of the most important trends taking place in recent years, with 36.4 percent of the medical doctors in private practice in 1965 board certified in specialty; 3) there is a concentration of osteopaths in northwest Missouri near Kirksville, the site of the original school of osteopathy; 4) there is approximately one dentist for every 2,000 people in Missouri; 5) there are 4.3 general hospital beds per 1,000 people in Missouri; 6) in the southwestern part of Missouri, the level of service available from medical service centers is more complex, with the centers themselves closer together geographically, etc. Tables are provided with data for each county in Missouri on a) number of medical doctors by type of practice, 1965; b) number of osteopathic doctors by type of practice, 1966; c) number of dentists by type of practice, 1965; d) medical doctors per 100,000 population, 1965; e) osteopathic doctors per 100,000 population, 1966; f) dentists per 100,000 population, 1965; g) beds in general non-federal hospitals, per 1,000 population, 1966; and h) actual and predicted specialized health services and population density and income by county.


This article contains summary statements and references to details of surveys of health behavior in two Missouri counties representing two very different social areas: Harrison County—high standard of living; value of achievement stressed, and Laclede County where the people have retained the folk culture generally characteristic of early American society.

The rate of illness in Laclede County exceeded that in Harrison County. A larger proportion of the people had visited a dentist at least once a year in Harrison than in Laclede. In total incidence and pattern of relationship, the family doctor relationship appeared similar in the two counties. In both counties there was a wide discrepancy between stated opinion and actual practice for certain selected health behavior.

Rural sociologists in the field of health need to integrate their work with the work of others and to strike out into new areas.


This is a report on the facilities (and their location) for the physically handicapped. Recommendations for additional services are given.
WELFARE PROGRAMS


Statistics are broken down by county and city.
Table of contents contains the following:

I. Programs
   A. Matching Funds
   B. Surplus Property
   C. Emergency Hospitals
   D. Radiological Defense Program
   E. Civil Defense Auxiliary Police
   F. Communications

II. Flood Disaster Coordination

III. Information and Education

IV. Special Activities

V. State Survival Plan

VI. Budget


This report is published annually.
Selected portions of the table of contents are:
—Missouri’s Interagency Committee on Mental Retardation
—Missouri’s Mental Health Program
   Community Mental Health
   State Hospital Programs
   Emotionally Disturbed Children
   Family Care Program
—Mental Health Centers
—State Hospitals

Statistical data are presented on:
—Biennial Appropriations for Division of Mental Diseases
—Earnings Fund Collections
—Personnel
—Average Daily Resident In-Patient Population
—Movement of Patient Population in State Mental Hospitals
—Movement of Population on Leave from State Mental Hospitals
—Mental Disorders of Patients in Hospitals for Mentally Ill (age and sex)
—Mental Disorders of First Admissions to Hospitals for Mentally Ill (age and sex)
—Mental Disorders of Patients in Hospitals for Mentally Ill
—Movement of Patients Under 18 years of age
—Summary of Out Patients and Traveling Clinic Activities
—County Residence of Patients in Missouri State Schools and Hospitals
—Patients in Missouri State Schools and Hospitals


This article contains information on facilities available for the aged in Missouri and examples of services available in Michigan and Minnesota.

TRANSPORTATION AND COMMUNICATION


This publication is a summary of the survey of the state’s urban and rural needs including primary and supplementary state highways, local rural roads, state highway extension, arteries, business and residential streets.


Researchers interviewed 1,416 homemakers in five counties (Perry, Dallas, Moniteau, Marion, and Bates) to determine how consumers acquire knowledge about food as measured by level of knowledge scores. Sources of information under study were radio, newspapers, television, and home economics clubs. Data indicated that the contribution of each source of information was not great in respect to total knowledge about foods, but the collective contribution was significant.


This publication points out that Rockwell-Standard Corporation financed a study covering 1,363 companies that had recently erected new plants. These companies were asked to name the five factors they considered the most important in their location decisions. The table below shows the ranking of plant location factors based on the frequency with which they were mentioned by the companies.
<table>
<thead>
<tr>
<th>Ranking</th>
<th>Percent of Total Mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proximity to good highways</td>
</tr>
<tr>
<td>2</td>
<td>Abundant labor supply</td>
</tr>
<tr>
<td>3</td>
<td>Availability of suitable land</td>
</tr>
<tr>
<td>4</td>
<td>Proximity to markets</td>
</tr>
<tr>
<td>5</td>
<td>Availability to rail service</td>
</tr>
<tr>
<td>6</td>
<td>Availability to raw materials</td>
</tr>
<tr>
<td>7</td>
<td>Favorable tax structure</td>
</tr>
<tr>
<td>8</td>
<td>Favorable leasing or financing</td>
</tr>
<tr>
<td>9</td>
<td>Abundant water supply</td>
</tr>
<tr>
<td>10</td>
<td>Proximity of related industry</td>
</tr>
<tr>
<td>11</td>
<td>Existence of building sites</td>
</tr>
<tr>
<td>12</td>
<td>Community, cultural—recreational</td>
</tr>
<tr>
<td>13</td>
<td>Nearby vocational training facilities</td>
</tr>
</tbody>
</table>


This booklet is designed to show the size of the trucking industry in the Missouri Ozarks and the importance of trucking to the progress and prosperity of 19 counties: Barry, Barton, Cedar, Christian, Dade, Dallas, Douglas, Greene, Jasper, Laclede, Lawrence, McDonald, Newton, Ozark, Polk, Stone, Taney, Webster, and Wright.

Eighty percent of all the communities in these counties of southwest Missouri have no rail or air service. Therefore, their future growth and development depend upon the ability of trucks and buses to meet their needs.

Trucking is the Ozarks' biggest employer, paying 1 paycheck in every 7 in the 19-county area.


This is a statistical report on the road systems of Missouri for the state and by counties. Statistics are given by the type of road (surface material and width of lanes). Miles for each, as well as cost, are included.

The objective of this research is to test the methodology of forecasting population growth and economic activity in a development of a balanced program of highway planning.

The report is intended to serve as a guide to those who find it necessary to forecast the demand for highways. This is an evaluation of techniques that have been used in forecasting and should be of value to researchers and planners generally.

**STATISTICS AND MISCELLANEOUS**


This is a 62-page circular containing a chronological record of industrial development and community activity for Douglas County, Missouri, 1944-1964. Activities of 1957-1964 represent efforts of committees composed of local citizens which have enlisted the aid of local, state, and federal agencies, as well as private organizations and corporations in order to bring about a higher standard of living for residents of the area.


This is a discussion of past surveys of public library developments in Missouri. Discussed are such topics as the New Missouri Plan Under the Library Service and Construction Act, the Library District Method, the Cooperative Method, and grants-in-aid.

Significant points of the article are as follows: 1) objectives of state library program include the development of permanent and adequate public library service, the use of federal funds, the encouragement of libraries which fail to meet adequate standards, and the promotion of public understanding of good public library service; 2) local projects for which federal funds may be utilized include library service system demonstrations conducted by the state library and strengthening major resource libraries; 3) one major achievement of the new state plan is the establishment of library systems by means of joining currently existing county, regional, and municipal libraries; 4) effective library service will become a reality only when all types of libraries attain minimum service standards.

Published annually, it contains statistical data on 1) the effect of population trends on need for public welfare, 2) the review of the year, 3) the legislative developments, 4) the public assistance programs, 5) the service to the blind, 6) the child welfare services, 7) the Federal Soldiers Home at St. James, 8) the expenditures and sources of funds.


This is a statistical data sheet containing basic community information for individual cities. There are such data sheets available on 230 communities in Missouri. Information is included on location, population, municipal services, educational facilities, community services, transportation services, utilities, labor, local manufacturing, health facilities, recreation, tax structure, industrial sites, local industrial development organizations, and miscellaneous. These data sheets can be obtained through the Missouri Division of Commerce and Industrial Development, Industrial Division, Jefferson City, Missouri.
Section IX

Governmental Programs,

Plans, and Services
This is the official organization handbook of the federal government. It contains sections describing the agencies of the legislative, judicial, and executive branches. It also contains brief descriptions of quasi-official agencies and of selected international organizations. Included as supplemental information are charts of some of the more complex agencies, brief histories of agencies abolished or transferred since 1933, and references showing where agency rules are published in the Code of Federal Regulations.

Perhaps of greatest interest is Appendix B which contains an extensive bibliography of current publications of departments and agencies of the federal government. These representative listings cover almost any phase of economic or social development in which one might have an interest.


This study is directed toward the problems of community development in urban areas. The author finds the coordination of development programs to be less than satisfactory and recommends that the federal government should make better use of its conditional grants and federal aids to (1) create a new focus on comprehensive environmental policy, especially in metropolitan areas; (2) encourage the development of metropolitan councils of governments as the most feasible vehicle for metropolitan coordination of community development programs, and (3) encourage the states to take a more active and progressive part in the administration of federal aids for community development.


Title I provides financial assistance to strengthen community service programs of colleges and universities "for the purpose of assisting the people of the United States in the solution of community problems such as housing, poverty, government, recreation, employment, youth opportunities, transportation, health, and land use." To be eligible for funds under Title I, a state must designate or create a state agency or institution which has special qualifications for solving
community problems and which is broadly representative of institutions of higher education in the state which are competent to offer community service programs. Each state must also submit to the Commissioner of Education, Department of Health, Education, and Welfare, a state plan which meets certain prescribed criteria for administering funds available under Title I.


The act provides grants and loans to public and other non-profit institutions of higher education to construct, rehabilitate, and improve buildings to house classrooms, libraries, and laboratories needed to expand enrollment. Public and nonprofit private institutions of higher education are eligible under the specific provision that the construction will result in urgently needed and substantial expansion of the institution's student enrollment capacity or, in the case of a new institution, result in creating urgently needed enrollment capacity.


The purpose of this act is to promote commerce and encourage economic growth by supporting state and interstate programs to make the findings of science readily available and useful to American enterprise. The Act authorizes financial assistance for various technical services including funds for sponsoring industrial workshops, seminars, training programs, Extension courses, demonstrations, and field visits designed to encourage the more effective application of scientific and engineering information.

The governor of any state wishing to receive federal funds to support existing or planned technical service programs shall designate an institution or agency to administer and coordinate the program and to prepare and submit a five-year plan and an annual program to the Secretary of Commerce for approval under this act. Annual grants for State Technical Services programs require matching by non-federal funds.

A "qualified institution" under the provisions of the act is: (1) an accredited institution of higher learning; (2) a state agency or a private, nonprofit institution which meets criteria of competence established by the Secretary of Commerce.
The nature of the Overall Economic Development Program is described, and
guidelines for preparing a plan are provided. How to submit a plan for approval
is described also.

U.S. Office of Economic Opportunity, *Catalog of Federal Programs for
414 pp.

This catalog was published in order to provide a basis for understanding the
social and economic legislation enacted by the 89th Congress, 1st Session. It is
intended to help individuals and communities meet their own goals for economic
and social development. It answers the basic questions of what federal programs
are available for individual and community improvement, what the eligibility re­
quirements are, where to apply, and where to get additional information.

U.S. Office of Economic Opportunity, *Poverty Program Information as of

This two-volume report is a quarterly summary of all programs initiated un­
der the Economic Opportunity Act of 1964. It contains information on grants,
projects, and participants from the date of the enactment of the Act through
December 31, 1965. Data are broken down on state, county and lower level gov­
ernmental units.

Bartholomew and Associates, *A Prospectus of a Plan for the State of Mis­
souri*. Prepared for the Planning Section, Division of Commerce and In­

A review of the needs for state planning revealed the following needs:

1. A *centralized data and research center*—Each state agency has voluminous
data regarding its respective facilities and responsibilities, but other agencies are
seldom familiar with the details of such information and may have duplicated
data.

2. A *general plan of physical facilities*—A long-range plan delineating the
general location, extent, and character of the many physical facilities is essential.
The agencies responsible for such facilities now devote considerable study to the
probable future needs of their respective facilities. However, in the past, no prac­
tical means has prevailed where the needs and plans of the individual agencies
could be developed and translated into a comprehensive overall plan.

3. A *plan for use and conservation of natural resources*—This plan should focus
on physical resources which the state does not own, but which are of basic im­
portance to its economy and welfare.
A plan for improving human resources—In this area of most vital importance, studies should be initiated to serve as informational guides for planning state assistance.

In implementing these recommendations it was found essential that a separate agency and staff be available that could devote full-time to guiding and coordinating the development of a state plan. Because of limited personnel and the fact that each department or agency is completely independent, it would be impractical to attempt to prepare a state plan for Missouri by use of personnel from existing departments and agencies. The program can best be developed by making all possible use of state agencies, substantially enlarging the present state planning staff, engaging competent planning consultants, and contracting with other public and private agencies for special studies and analyses.

The report then discusses methods of developing the state plan, and presents a budget for the state plan. Appendix “A” of this report is a summary discussion of the data and information that will be compiled and analyzed, the general types of recommendations and the objectives, and how each phase would be developed. The latter comments are especially directed to the public and private agencies that may be engaged to provide special services, since the planning staff will have primary responsibility for insuring that the entire plan will be satisfactorily completed.


The author suggests that, in broad terms, the new strength of the executive branch of state governments came about as a result of governors’ political (and hence legislative) power. Since World War II, there have been new constitutions in Georgia, New Jersey, and Missouri. Missouri’s big change developed more from “popular initiative” than from party leaders in the legislature or the governor’s office. Perhaps for that reason, gubernatorial powers were not increased by the new Missouri Constitution as much as they were in New Jersey. Therefore, Missouri still has the long ballot with many elective positions having strictly executive duties instead of those positions being appointive ones. The new constitution did, however, attempt to limit the duties and powers of these elected officers.


The purpose of this report is to present a statistical review of the influence of the state and federal revenue assistance on local government financing in the
major metropolitan areas of Missouri. The four Standard Metropolitan Statistical Areas (SMSA) of Missouri were analyzed to determine the amount and percentage of state financial assistance made available to urban Missouri in 1965. The four areas, based on the 1960 decennial census, are:

- St. Louis: St. Louis City and County, St. Charles and Jefferson Counties
- Kansas City: Jackson and Clay Counties
- St. Joseph: Buchanan County
- Springfield: Greene County

The state provided 201.8 million dollars to these metropolitan areas in 1965. This amounted to slightly less than 38 percent of total state expenditures, yet these four areas comprise 59 percent of the population of the state, and contributed 46 percent of the state revenue from six major taxes. The state furnishes financial assistance to local governments in the form of grants in aid and shared taxes. However these revenues are provided for a specific purpose, such as highways, education, hospitals, and welfare.

The study attributes a large part of the financial problems facing metropolitan areas to a lack of understanding of the funding process generated by rapid urban growth. In this respect, one particular area of expenditure deserving attention and possible implementation in Missouri is the category termed "general local governmental support." This category is defined by the U.S. Census to mean those monies distributed by the state to local governments without restrictions as to the purpose or function to which the monies would be applicable by the receiving government. In this category, Missouri ranked 33rd among the states in 1964, with a per capita expenditure of $1.09.

Missouri Division of Commerce and Industrial Development, *This is Missouri Community Betterment*, and *The A B C’s of Missouri Community Betterment*. Information Pamphlets of the Community Betterment Section, Missouri Division of Commerce and Industrial Development. Jefferson City, Missouri: Undated. Unnumbered.

These pamphlets explain the activities of the Missouri Community Betterment Program. The program is essentially a community self-improvement activity, with three phases. Phase A or Community Analysis is a process of self-analysis for improvement so that the community will have an idea of its status and capabilities. There are five major areas with appropriate subdivisions that a community may elect to use for self-appraisal. These areas are: (1) economic development; (2) social development; (3) beautification; (4) awareness (publicity); and (5) governmental services. Aids furnished to each community include a handbook designed to outline the program; two copies of a workbook, which is a guide for the community to follow throughout the program year; a reference book, which includes information helpful to various committees of the program; and a scrapbook for the community to record accomplishments for the year.
Phase B is the Awards phase. Each community may select one or more projects and submit their efforts in the Annual Awards Competition. Prize money is awarded in state-wide judging and categories are based on population. Phase C is the Five Star Program which revolves around planning and accomplishment. In this phase, the community plans and compares its work with established standards that are set up by such organizations as the State Department of Education, the State Division of Health, the Water Pollution Board, the University of Missouri Extension Service, the Missouri Good Roads Association, utility companies, and other professional people in related fields. The five stars represent the following five areas:

1) Education
2) Utilities
   - water
   - sewer
   - street lighting
3) Transportation
   - streets
   - air marking
4) Community Planning
   - planning and zoning
   - industrial program
5) Community Services
   - health services
   - fire protection
   - police protection
   - leisure time activities

As a community meets the qualifications in a particular category and these qualifications have been confirmed by the evaluators, it is awarded a star to be displayed on signs at the entrances to the community. The stars will remain on the signs as long as the community is a part of the Community Betterment Program and meets the established standards.


The bill creates a state planning office (under the Governor of Missouri), which will give assistance to traditional units of local government, and authorizes regional planning commissions. These new regional commissions may be created without referendum. The major purpose of the commission is to produce an agreed-upon plan and to foster inter-local cooperation. Furthermore, the bill is designed to satisfy many federal program requirements for comprehensive planning.

The regional planning commission will be primarily advisory and will be
financed by the local governmental units plus any federal funds available for planning purposes. Regions are not defined in the bill, but factors taken into consideration for determining a region include: homogeneity; topographic and geographic conformations; extent of urban development; the existence of special or acute agricultural, forestry, conservation or other rural problems; uniformity of social or economic interests and values; park and recreational needs; civil defense; and the existence of physical, social and economic problems of regional character.

Office of State and Regional Planning and Community Development, Executive Department, Guides and Informational Materials for the Formation and Operation of Regional Planning Commissions in Missouri. Jefferson City, Missouri: 1966. 70 pp.

This publication is designed to explain the State and Regional Planning and Community Development Act passed by the Missouri Legislature in 1966. In essence, the Act provides the legal framework for local governments to handle planning for growth and development problems having little relationship with city or county lines. The law provides that any single city, county, or number of counties can petition the governor to establish the boundaries for a regional planning commission. The governor, guided by the requirements in the state law, and after public hearings, designates the boundaries of a region. The local governments within that region then make their decision to join. Those who join then decide how to compose the membership and organization. In this respect the publication lists a step by step guide for organizing a Regional Planning Commission and suggestions for organization of the commission, including first meetings and early business.

Aid and assistance are available to any regional commission from the Office of State and Regional Planning. This agency is the official state planning body in charge of developing a state plan and therefore has a staff of professional planners to assist regional commissions upon request. The regional planning commission has only advisory power with no authority to enforce or compel compliance with its regional plan. For example, the regional plan will have a land-use component, but it is the responsibility of the local government to establish zoning ordinances to make the plan effective.

The law provides that a regional commission may contract for, receive, and utilize grants or other financial assistance from the state or federal government or from any other source, public or private, to carry out its duties. The biggest item of financial assistance comes from federal planning grants.


This is the most recent of the biennial series of "Bluebooks" published under the direction of the Missouri Secretary of State. These publications contain a wide variety of information on Missouri. Part of the information including assessed valuation, county officials and election returns is provided on a county
basis. It also provides a description of the organization and function of the various state agencies.


This publication sets forth the central goal of the Missouri Office of State and Regional Planning and Community Development as "The Betterment of Man." Within this generalized framework the functional process is viewed as that of planning and developing by: (1) Changing the environment for the betterment of man (physical planning and development); (2) Adapt man so he can better cope with his environment (social planning and development); and (3) Provide the resources needed to meet the goal (the investment required for social and physical development).

In examining the current problems of the state in terms of economic and social development the staff sees two alternatives: (1) improve the present location; or (2) create new locations. The report suggests that it might be more advantageous to create a few completely new industrial cities than to correct the complex economic and social ills of cities built for the previous era. The report describes the general procedure for planning and developing a new city at the intersection of Missouri River and Interstate 70 west of Columbia. Also discussed are transportation (turnpikes and rapid transit) and slum problems. Finally the report proposes a State Planning Advisory Board to be made up of the directors of state agencies with limited legislative representation. The board would serve as a means of getting the key personnel involved in state planning, keep the individuals better informed of different programs and needs, as well as providing a basis for better coordination of state-wide programs.

**LOCAL**

County or Area Development Council(s), *Overall Economic Development Programs* (OEDP's). Prepared for U.S. Department of Commerce, Area Redevelopment Administration. Dates vary.

The basic format followed in all of these studies is: (1) redevelopment area organization (consisting of the title, history, board members, legal authority, and accomplishments of the organization); (2) the redevelopment area and its economy (consisting of a general description of the area with respect to location, topography, climate, population, cities and towns, economic characteristics and unemployment problems, the characteristics of the leading industries, major employers' products produced, the potential of the area, and the area's past efforts to solve its problems); (3) bases for economic growth (consisting of mineral resources and their potential, the agricultural situation and problems, forest products and their potential, historical significance of area, potential industrial sites, vacant industrial and commercial buildings available for use, training and educa-
tion for youth and adults); (4) problems and needed adjustments of the county; and (5) area goals and programs.

The following counties have participated in an Overall Economic Development Program (O.E.D.P.) of the Area Redevelopment Administration of the U.S. Department of Commerce on a county or multi-county basis:

- Pemiscot
- Butler
- Ripley
- Carter
- Franklin
- Washington
- Ste. Genevieve
- St. Francois
- Bollinger
- New Madrid
- Dallas
- Douglas
- Ozark
- Putnam
- Sullivan
- Wayne
- Madison
- Iron
- Reynolds
- Dent
- Livingston
- Miller
- Mississippi
- Grundy
- Lafayette
- Hickory
- Shannon
- Oregon
- Perry
- Texas
- Howell
- Taney
- Stone
- Wright


The purpose of this manual is to familiarize elected municipal officials with the place of local government in the federal system, the basic legal structures of local government, their duties and responsibilities, and the various agencies and organizations which provide information and aid to local governments.

The areas of municipal activities considered in the manual are: (1) the Place of Local Government in the Federal System; (2) Municipal Government in Missouri, (3) Municipal General Law and Charters; (4) Municipal Home Rule; (5) Constitutional Charters; (6) Special Charters in Missouri; (7) Forms of Government in Missouri; (8) General Duties and Responsibilities of Councils; (9) Conduct of Council Meetings; (10) Conflicts of Interest; (11) Duties and Responsibilities of Mayors; and (12) Municipal Employer-Employee Relations.

Important information included in the appendixes covers: (1) A glossary of terms; (2) federal aids for local governments; (3) A listing of state officers, departments, agencies, and directors; and (4) A listing of state and national professional and service organizations serving local governments.


This study was designed to determine whether local agencies were effective
economic agents for dealing with problems of land reclamation by drainage. The reclamation of southeast Missouri low-lands was chosen for the case study of local reclamation decisions. The two general tests of these agencies were: (1) did they provide the organizational basis for efficient engineering solutions for the water control problem of the low lands and (2) were the benefits resulting from their operation in excess of the costs associated with them. The land reclaimed was generally very productive and well adapted for profitable cash crop agriculture. Reclamation in southeast Missouri contributed to improved land use, but many of the potential benefits were not realized and the costs were greater than necessary. Local districts could have been adapted to provide efficient reclamation planning, but decisions by the state and federal governments precluded it.


This report reviews recent legislation in Missouri which makes it possible for second, third and fourth class counties to engage in planning and/or zoning under what is called the "alternative method." Class two and three counties were authorized to establish planning and zoning under earlier law, but class four counties were not permitted to do so until passage of the legislation described in this study.

The County Court initiates the action to determine whether a county adopts planning and/or zoning. They may initiate the procedure by calling for the citizens to vote on the adoption of (1) county planning, (2) county zoning, or (3) both planning and zoning. This may be done at either a special or general election. A majority vote is required for adoption.

If only county planning is voted upon and if a favorable vote is received, the County Court is directed by law to create a County Planning Commission. The County Planning Commission is directed by law to prepare a master plan for all areas of the county outside the corporate limits of municipalities which have adopted a city plan according to law. The overall purpose of the master plan is to coordinate the physical development in accordance with present and future needs. Specific objectives are (1) to conserve the natural resources, (2) to insure efficient expenditures of public funds, and (3) to promote the health, safety, convenience, prosperity and general welfare of the inhabitants.

Once the comprehensive master plan is prepared the County Court has the authority to either adopt it in the form recommended by the planning commission, or to modify it as they see fit. However, before they do either, they are required to hold a public hearing at which the views of citizens can be presented. After the master plan has been adopted and recorded it cannot be changed by the County Court without first securing, in writing, the approval or recommendations of the County Planning Commission.
If county zoning is voted upon, and if a favorable vote is cast, the County Court is authorized to regulate, in the unincorporated areas of the county, the height and size of buildings, the density of buildings and population, and the location and use of buildings and land, with certain exceptions (farming). It is also permissible for the court to establish zoning districts throughout the county. This means that certain areas would be designated for agricultural, residential, industrial, commercial, or other use. However non-conforming uses existing at the time the district was established are allowed to continue under Missouri law.

If a planning commission exists, the county court must request it to recommend both the boundaries and zoning regulations for the different districts. If the county does not have a planning commission, the County Court is directed to appoint a County Zoning Commission. The zoning commission is directed to prepare a proposed zoning order and hold a public hearing in each of the townships affected by the proposed order. Within 90 days after final adjournment of the hearings the commission must make a report and submit a proposed zoning order to the County Court for adoption. The court may either adopt, modify, or refer this proposed order back to the zoning commission for further study.

The third alternative on which the citizens may vote is for both planning and zoning. If a majority of the votes are favorable then the County Court may proceed under the provisions of the act relating to both planning and zoning as set forth above.

Whether a county has (1) planning, (2) zoning, or (3) planning and zoning, it may be terminated if a majority of the voters vote for termination. Then the county must discharge any commission established, and void all regulations and ordinances.


This handbook is designed to inform local governmental officials on the laws of Missouri regarding the extension of city boundaries, or annexation. The text explores the different annexation procedures outlining differences as well as similarities.

Annexation in Missouri involves both a legislative and judicial process. The legislative portion is the determination, by the local municipal legislative body, that an annexation is necessary and the extent of the proposed limits of the municipality. The judicial function is the determination by the courts of the reasonableness and necessity of the annexation. Reasonableness is viewed both from the point of view of residents and landowners in the area to be annexed as well as from the city extending its limits. Necessity is viewed from the present and reasonably foreseeable requirements for the proper development of the annexing city.
In regard to the spectrum of laws of the various states relating to annexation, Missouri might be considered to be divided. Outside of the constitutional charter county of St. Louis, the laws relating to municipal annexation could be considered nearer the more liberal side with simple majority voter ratification needed only within the annexing city, with the first class cities and towns and villages requiring no voter approval. In St. Louis County, however, the law is highly restrictive, requiring voter approval not only within the annexing city, but also from within the area sought to be annexed.

First class cities annex by ordinance of the mayor and council; second, third, and fourth class cities annex by ordinance of the mayor and council together with the ratification of a majority of electors voting on the question; and towns and villages annex by filing a petition with the county court and securing its order without any voter approval. Since 1953 all municipalities other than constitutional charter cities and towns and villages (except towns and villages within St. Louis County) must secure a declaratory judgment of the Circuit Court authorizing annexation prior to proceeding to annex.


This document is a summary of the findings and recommendations of the St. Louis County Planning Commission on physical development policy, or more specifically, the land-use plan. The general objectives, principles, and standards set forth in this publication are the basis upon which the St. Louis County Comprehensive Development Plan is based. In addition to the six objectives listed below the commission lists county development standards, gives examples of desirable development patterns, and lists various "rules" to help obtain the objectives.

*Residential objectives*—To preserve and create living areas that are compact and identifiable, offering overall security and affording the possibility of freedom of choice of residential dwelling type, social intercourse, and creative individual living.

*Commercial objectives*—To locate commercial facilities according to the function served by the particular type of facility.

*Industrial objectives*—To provide locations and facilities for diversified industrial activities at many accessible and convenient places within the county.

*Open Space objectives*—To preserve, restore, and enhance the natural areas or man-made features of the county as a means of satisfying the psychological needs of the people for recreational, cultural, and aesthetic pleasures; to preclude urban development in areas generally unsuitable for such development; and to delimit the urban areas into meaningful forms.

*Rural objectives*—To prevent urban development from expanding beyond an area of demand in the interests of efficient and economic land-use and the conservation of land resource.
Circulation objective—To provide an adequate means of carrying people and goods quickly and efficiently, meeting the existing and future needs of the county and the metropolitan area.


This study was designed to explore local cooperation in the rural, non-metropolitan portions of five states—Alabama, Indiana, Nebraska, Pennsylvania, and Wisconsin. These states were selected as representatives of those with a variety of systems of local government.


These three reports follow essentially the same format. They are designed to present the findings and detailed recommendations appropriate to local governments that have been, in essence, overwhelmed by the rapid urbanization of St. Louis County. The inter-governmental, governmental, and administrative problems generated by this growth and development went beyond the resources of the local governmental units to resolve them. These reports originated out of a request made by the Lafayette Area Inter-City Action Committee to the University of Missouri, St. Louis County Extension Center, for assistance in analyzing the problems.

Through joint efforts of the committee, the Extension Center, and the local government consultant, local governmental participation was invited. Resolutions were passed by the boards of aldermen of each city, except Ellisville, expressing their willingness to cooperate in all phases of the appraisal and granting access to the city halls and their records for the purpose of carrying out the necessary research.

These reports are divided into six parts. Part I contains a summary of recommendations. Part II contains the introduction. Part III describes the local governmental environmental system as to its impacts and influences on local government. Part IV describes and appraises the local governmental system and the services furnished to the citizens. Findings are presented as to the governmental effectiveness and the adequacy of the services furnished to the citizens with conclusions, recommendations, and actions to be taken. Part V describes intergovernmental, special district, and private services. Part VI sets forth overall governmental appraisal, conclusions, and recommendations.

In this speech Senator Vanlandingham traces the history of Missouri county government and points out the changes made under pressure of increasing or decreasing population, and improved transportation and communications. The cost of the present system of county government is increasing each year. It is pointed out that if many counties were forced to pay the prosecuting attorney a living wage, instead of allowing him to practice civil law for a living, they would be unable financially to do so.

Senator Vanlandingham sees for the future the formation of mega-counties—large counties of geographical proximity and like interests organized by doing away with present county lines. It is pointed out that this change may not be far away because already many counties are banding together for county planning, zoning, and economic development. School districts have been combined into consolidated schools for economy and still provide better education.

The division of the state into 25 to 30 mega-counties probably would be on a population basis. The seat of government would be centrally located, and all governmental functions of the area would be carried on from that central location. Such a governmental unit would provide the tax base to enable local government to hire the best trained people to administer county government. Electronic computers could be used to economically and efficiently replace outdated accounting systems.
Section X

Finance and Taxation
The purpose of this study was to determine what effects urban expansion has had on a specific rural urban fringe area in St. Louis County, Missouri. It considers the effects on assessment, taxation, land-ownership and land use. In this research data were assembled on 267 tracts and a complete subdivision in the Florissant section of St. Louis County. Dissatisfaction with taxes on farm land in rural fringe areas is widespread because farmers cannot pay real estate taxes based on urban values out of earnings from the land when it is in agricultural use. Often the land is sold to real estate interests years in advance of its need for urban development and non-use or under-utilization results.

Some states have had preferential assessment on farmland in these areas. Other times authorized local government units have purchased land or development rights in these fringe areas. A third possibility of deferred taxation would appear to present fewer difficulties and encounter less opposition because it avoids granting special privileges to land owners as under preferential assessment. It also avoids the necessity of local government entering the real estate market and competing with private enterprise. Under this system, title to the land would remain with the present owner and it would be assessed based on its present use. When the land was sold at a price in excess of its use value, all deferred taxes would be collected from capital gains.


This is an analysis and evaluation of various business taxes in St. Louis.


This article discusses the effect of the corporate income tax, sales tax, industrial property tax, miscellaneous business tax, and entrance taxes on new businesses and their effect upon plant location within the state.

The article concludes that the effect of state and local tax differentials on industrial developments yields no consistent relationship between state and local tax differentials and industrial growth. The article suggests that this lack of correlation exists for the reasons that (1) taxes from most companies represent a
small portion of total cost, (2) any difference in tax cost which may exist between alternative locations can very well be offset by differences in government services provided.

Missouri probably offers tax advantages over other Midwestern states which compete with Missouri for industrial development, such as Illinois, Indiana, and Nebraska.


This article reviews the investment credit section of the Revenue Act of 1962 and explains how its provisions apply to farm businesses. In general, property which is depreciable and has a useful life of four years or more will qualify for the investment credit if it is within the definition of any of the three allowable categories of the 1962 Act. For example, the typical farmer will usually have many items of tangible property that will qualify for investment credit treatment, the most obvious being machinery and equipment. Other examples are given on more complex claims such as corn cribs or terraces.


This report indicates that substantial federal estate tax savings can be accomplished by controlling the form of asset disposition. An individual's particular circumstances will determine whether maximum savings can be accomplished by a will, inter vivas (lifetime) or testamentary (after death) trust, gift, sale, family annuity, co-ownership of assets, or other form of disposition. Alternatives are discussed.

Governmental Research Institute, Local Government Revenues in St. Louis County and Other Suburban Counties. St. Louis, Missouri: November, 1964. 29 pp.

This is a statistical survey of local government revenue patterns in St. Louis County in 1963. Comparisons with other comparable counties are made.


This publication contains a complete listing and discussion of all taxes and fees of direct interest to manufacturers. Information included covers the following on major taxes:

- Corporate franchise tax
- Income tax (individual and corporation)
Intangible property tax
Unemployment insurance tax
Workman's compensation tax
Workman's compensation second injury fund tax
Local property tax
State property tax
   - Real estate
   - Personal property
   - Merchant's inventories
   - Manufacturer's materials, products, and equipment
   - Sales use tax

The following information is presented for each of the taxes:
Authorization
Basis of tax
Assessment and collection
Rate
Returns and payment due dates
Exemptions


This report compares state and local taxation practices in Missouri with those in the other 49 states; to 19 selected states in the Midwest, Northeast, and South; and to the eight states adjoining Missouri. A summary of the 50 state comparisons revealed that Missouri ranked: 49th in the amount of state and local government revenue collected per $1,000 of personal income; 49th in per capita state tax revenue and state tax revenue per $1,000 of personal income; 37th according to per capita property tax in state and local tax structure; 25th according to the rates of assessed value to sales price for all types of real property involved in measurable sales during a six-month period, 1961; 45th according to per capita net long-term state debt outstanding at the end of 1965 fiscal year; and lowest in adjusted maximum rate of state corporation income tax of the 37 states levying such a tax.

Statistics presented in the two other comparisons (19 competitive and eight adjoining states) also show Missouri to rank low in the "tax bite" taken for state revenue. In spite of the restraint in taxation policy Missouri ranks 6th in direct expenditure for public welfare; 9th in gross state expenditure for highways; 18th in state expenditures for state hospitals and institutions for the handicapped; 22nd in total direct expenditures for higher education; 23rd in gross state expenditures for education; and 24th in total expenditures for correctional work for incarcerated persons.

This publication is concerned with: (1) Income tax management—topics covered in this section include managing capital gains and losses, managing depreciable property, managing property transfers and spreading income losses between years. (2) Tax management of livestock—this section discusses the sale of livestock, planning for capital gains in livestock, livestock inventories, depreciation of livestock, and dealing in livestock futures exchanges. (3) Tax aspects of machinery and equipment—this section discusses investment credits and ordinary depreciation schedules, fast depreciation, capital gains and losses, tax-free trade-in, involuntary and reinvestment and losses on machinery, and equipment. (4) Tax planning of real estate—this section discusses selling the farm, selling on an installment method, unharvested crops sold with the land, personal residency, condemnation and reinvestment, exchanges on farms, seller’s tax recapture, purchasing a new farm and developing a new farm.


A survey of the assessed values and real property taxes on forest and agricultural lands in 26 counties of south Missouri, 1954-63. The study found that inequity in assessing forest land was reduced slightly during the 10-year period, but forest land-owners, on the average, were still taxed higher than owners of other rural lands. Taxes in 1963 consumed 28.5 percent of the annual value growth of timber and 4.1 percent of the gross income from agriculture. It is concluded that the greatest need in administration of the real property tax is more equitable assessment for forest land owners.

**Financing Industrial Development**


This study is designed to determine if the credit needs of Missouri were adequately met and what role the development corporations played in industrial financing. Chapter 2 involves a discussion of commercial bank lending in Missouri. Primarily the discussion centers around two factors: the size of Missouri with the resulting legal lending limitations, and bank lending policy as indicated by a survey of Missouri bankers. The third chapter is a discussion of the general aspects of life insurance lending with emphasis on how legal regulations and lending
policy affect loans to small manufacturers. Chapter 4 discusses the minor role of savings and loan associations in lending to small manufacturers.

Lending practices of the Small Business Administration are presented in Chapter 5 followed by details on Small Business Investment Companies in Chapter 6. The seventh chapter discusses the use of municipal bonds for industrial development purposes in Missouri. Chapter 8, "Local Industrial Development Corporations," describes the usefulness and limitations of these corporations. Chapter 9 briefly mentions the Economic Development Administration, pension funds, and finance companies as sources of credit. The final chapter describes the activities of development finance corporations in other states, especially Kansas; the regulations contained in the Missouri law; and the advantages and limitations of these corporations.

This report's findings indicate that credit-worthy manufacturers in a significant number of Missouri communities are unable to obtain needed funds, funds which would be available to some of these if a development finance corporation did exist. The lending practices of existing institutions reveal a gap in the extension of credit of roughly the 5-to-15 year maturity range.

In general, the 5-to-15 year period is too short for industrial development bonds, life insurance mortgage lending, and pension funds. The Small Business Associations cannot make loans for more than 10 years, and the Small Business Investment Companies have not filled the gap. Although loans from the Economic Development Administration can be obtained in this maturity range, most Missouri counties are not eligible for assistance. Finance companies prefer the shorter maturity loans. Those local industrial development corporations which have access to sufficient resources show a preference for providing facilities to companies moving into the community.

Thus, the extent of the gap to a large measure depends upon the practices and capabilities of the manufacturer's commercial bank. Consequently, there may be no gap at all for credit-worthy manufacturers which have a good relationship with certain large Missouri banks. However, a significant percent of Missouri banks will not make long-term development loans, and legal lending limits will not permit a great many small banks in the state to meet the credit needs of such borrowers (except through participating with other banks).

That conventional lending institutions are unable for one reason or another to meet the demand for credit is also suggested by the fact that unconventional sources of funds have found a relatively high degree of acceptance among smaller Missouri companies. In only a few states has the Small Business Association made more business loans than in Missouri. Also, the number of Missouri companies obtaining Small Business Investment Company assistance is higher than one would expect considering the fact that there are so few such companies in Missouri. Furthermore when compared with other states a significant number of the state's manufacturers have financed expansion through industrial development bonds. These facts also indicate that manufacturers in the state would not be particularly reluctant to seek funds from a development corporation.

A study of the deeds of trust in seven Missouri counties (Atchison, Clark, Livingston, Audrain, Polk, Dent, and Pemiscot.)

The deed of trust was found to be in general use as a security device in financing Missouri farm land transfers. It is used primarily in transfers where a low down-payment is made, but was found to be used when 35 percent or more of the purchase price is secured by down-payment. The deed of trust was used by both institutional and non-institutional lenders. The popularity of the deed of trust is due, especially in low down-payment transactions, to the legality of a nonjudicial foreclosure sale under Missouri law.


This report is an explanation of the statutory provisions relating to Industrial Development Bonds as contained in the 1965 Supplement to the 1959 Missouri Revised Statutes and in Article VI of the Constitution as amended August 17, 1965. This legislation makes Missouri competitive with some 38 other states having similar legislation. Simply defined, industrial development bonds are bonds issued by the municipality to obtain funds for acquiring, constructing, or improving industrial plants including plant sites, machinery and equipment. These in turn are leased to a private industrial enterprise for the conduct of its business.

The bonds are either (1) general obligations, secured by the taxing power of the municipality or (2) revenue bonds, secured solely by the income from the property procured under the terms of the lease contract. Where the industrial project has been created by the use of revenue bonds it is mandatory that the lease provide adequate revenue for payment of the bonds and the interest thereon. Under both general obligation and revenue bond programs, the title to the property specified in the lease vests in the municipality until the bonds have been retired and all of the terms of the lease fulfilled. At such time, and under the above conditions, the property may then be sold or otherwise disposed of pursuant to law.

General obligation bonds may be issued by any municipality, no part of which is located in a county of more than 400,000 population. However, the amount which may be issued is limited to 10 percent of the assessed valuation of the taxable tangible property of the municipality. This is over and above any amounts issued for purposes other than industrial development. Generally speaking, the interest rate on general obligation bonds is lower than that of revenue bonds. In addition, the general obligation bonds may be issued for a period not
to exceed 20 years. On the other hand, revenue bonds may be issued for a longer period, and limited only by what the market will bear.

A municipality may combine both general obligation and revenue bonds to cover one industrial project. By terms of the lease either type of bond may be retired before the other. No municipality may combine both general obligation or revenue bonds for industrial projects without first approving the plan for the project by majority vote of the governing body of the municipality; securing approval of the plan from the Division of Commerce and Industrial Development; and receiving affirmative votes of the qualified voters voting, at a regular or special election, approving the project as follows: (1) Two-thirds of the qualified voters voting if the project is to be financed by general obligation bonds; (2) Four-sevenths of the qualified voters if the project is to be financed by revenue bonds.


This publication contains cost information on 22 industrial buildings constructed during 1965 or 1966. The information includes total costs and subcosts for the total building as well as for such items as plumbing, electrical, site work, structure and finish, heating and ventilation. These costs are also given on a per square foot basis and as a percent of total costs. It also provides basic construction information, descriptions of special features and the size of the building in square feet as well as the space devoted to manufacturing, storage, office, shipping, and other uses. The data is divided into two sections: (1) multi-purpose buildings; and (2) special purpose buildings.

Part two of the publication contains information on methods of financing building costs. Included are brief discussions on: (a) municipal bonding; (b) local industrial development corporations; (c) private financing; (d) Small Business Administration loans; (e) Economic Development Administration loans.


This report is based on data obtained from 15 farm supply cooperatives within a 75-mile radius of Columbia, Missouri. The objectives were to obtain information on retail credit administration, and to develop some guidelines that would reduce credit costs. Results indicated that most credit managers have a coordinated credit plan, or understand all the costs involved.

In associations where credit programs were well advertised, credit sales were
higher, yet year-end accounts receivable were considerably lower than in the other associations. This was considered an indication that thorough information about credit policies not only brings greater use of credit sales but results in better compliance with those policies.

In this study, associations that gave cash discounts had 27 percent smaller year-end accounts receivable in respect to total sales in 1963 and 30 percent smaller ones in 1962 than those associations not giving cash discounts. Also those associations that charged for their credit had 31 percent (1963) and 30 percent (1962) smaller accounts receivable than those who did not charge for credit.


This publication contains numerous statistical tables dealing with all aspects of financing Missouri’s public schools including salaries, income sources and potentials, state and local taxes, school facility costs and methods of state disbursement of funds. In addition, a discussion of the School Foundation Program is presented. This program is Missouri’s plan for financing schools by the joint action of the state and local school districts. State funds are based on average daily attendance, the number of teachers employed and the level of their preparation, the assessed valuation of the school district and the amount the district receives from county and township funds, railroads, utilities, and intangible taxes.

The school foundation program was developed by a special committee of the General Assembly in 1953-54, submitted to the voters as a referendum proposal by the General Assembly and approved by the voters in every county of the state and St. Louis City in a special election on October 4, 1955. The formula was revised by the General Assembly to provide more state funds for schools in 1959, 1963, and 1965.

An equalization quota is provided for school districts which receive less than $134 per pupil in average daily attendance from the following: a tax levy of $1.00 on each $100 assessed valuation, the amount received from county and township funds, and the sum received for school purposes from railroad, telegraph, utility and intangible and all other taxes based on assessments distributed by the state tax commission. The attendance of the district’s pupils in its own schools as well as in schools of other districts for which the home district pays tuition may be counted for equalization. Thus, under equalization, a base of $134 is established for each pupil in average daily attendance. A very poor school district with an assessed valuation of less than $2,000 per pupil in average daily attendance would receive as much as $114 per pupil in state funds as an equalization payment while providing $20 locally toward the $134 guaranteed at this level. Approximately one-half of the school districts in Missouri receive some amount on equalization. A second level of equalization was added to the school foundation program by the 1963 General Assembly. Under this provision a district which levies a prop-
erty tax that produces an amount not less than the product of a $2.75 tax on the property of the district assessed at 30 percent of true value as determined by the state tax commission may qualify for an additional equalization amount of $13 per pupil in average daily attendance. The effect of this is to provide for districts that qualify a level of equalization of $147 per pupil in average daily attendance. A payment based on the number of teachers employed by the school district having 120 or more college semester hours is the second part of the state payment under the foundation program. For each teacher employed who has 120 to 149 semester hours credit, $295 is paid. For teachers with 150 or more semester hours credit, the amount is $455 per teacher. No state payment is made on teacher preparation of less than 120 hours. The third payment under the foundation program is an amount of $113 per pupil in average daily attendance, usually referred to as flat-grant payment. This payment is made to all school districts meeting the requirements for participation in the foundation program. The average daily attendance of resident pupils and non-resident pupils attending schools in the district whose tuition the home district is required to pay, is counted for this payment. For the non-resident pupils this payment is deducted from the tuition that may be collected from the home district. If the number of teachers employed either in the elementary or high school does not average a full-time teacher for each 30 pupils in average daily attendance, no payment is made for any pupils in excess of this 1 to 30 ratio. Not less than 80 percent of the state funds received on equalization, teacher preparation and the flat-grant must be placed in the teachers’ fund. For 1965-66, the three parts of the program taken together, assuming a school district qualifying for second level equalization and a teacher with 120 college hours and an average daily attendance of 24 pupils per teacher, guarantee $272.29 per pupil from state and local sources. The state funds per pupil in average daily attendance range from approximately $252 per pupil in a very poor district to approximately $125.29 in districts not receiving equalization. At the time of the annual apportionment of state school monies, certain special aids are included for eligible districts. These include transportation aid, aid for handicapped children, orphan aid and building abandonment aid. For the 1965-66 school year Missouri will provide on the average $156 per pupil from state sources. For the nation as a whole the average amount per pupil provided from state sources is $221.


This article describes the role of banks in industrial development by saying that the bank is the logical hub of the community’s development efforts because of the banker’s intimate knowledge of the community and its economic aspects. Therefore, he can give advice and make judgments concerning location better than anyone else.

This report points out the problems of financing and operating the 20 local school districts in Henry County. Statistical data are presented to support the proposal for reorganization into a single district. It is asserted that the following would be the major benefits accomplished by a comprehensive reorganization: allow a more reasonable pupil-teacher ratio, enable financing new building facilities, and provide good teaching media, as well as a quality professional staff. It would provide a tax base broad enough to allow expansion of such programs as kindergarten, vocational training, and guidance counseling.


This extensive report was a part of the application presented to the U.S. Department of Housing and Urban Development requesting $1,245,900 for a Neighborhood Facilities Grant as provided in Section 703 of the Housing and Urban Development Act of 1965.

The preparation of this application involved some 25 agencies, 10 neighborhood organizations, and over 700 residents. The planning activities were coordinated by the University of Missouri Extension Division, City of St. Louis Extension Center. Planning committees included representatives of state and local agencies. Federal agency representatives were consulted periodically in the final stages of preparation.

The primary areas to be served by the neighborhood facility are the West-End and Union-Sarah Neighborhoods, containing 60,500 persons. These neighborhoods have been designated as poverty areas with the population suffering from sub-standard incomes, housing, education, and public facilities.

The report contains a summary of the views and services requested by the local residents and organizations. Also included are the various proposals made by the different local, state, and federal agencies for providing aid and services through the facility as well as plans for handling the neighborhood facility and services.


This is an analysis of revenues, expenditures and methods of financing Missouri road needs; projected to 1980. The discussion is structured according to the 10 highway districts of Missouri.
Two six-county areas in the state of Missouri were surveyed to analyze the credit system as it functions in relation to rural housing. The areas were located in North Central Missouri (a rural section) and Central Missouri (a rural-urban sector). Objectives were: (1) to determine the general characteristics of credit for rural housing in selected areas of Missouri with respect to cost, terms, and availability; (2) to compare these characteristics with those of credit for urban housing; and (3) to ascertain the reasons for differences, if any.