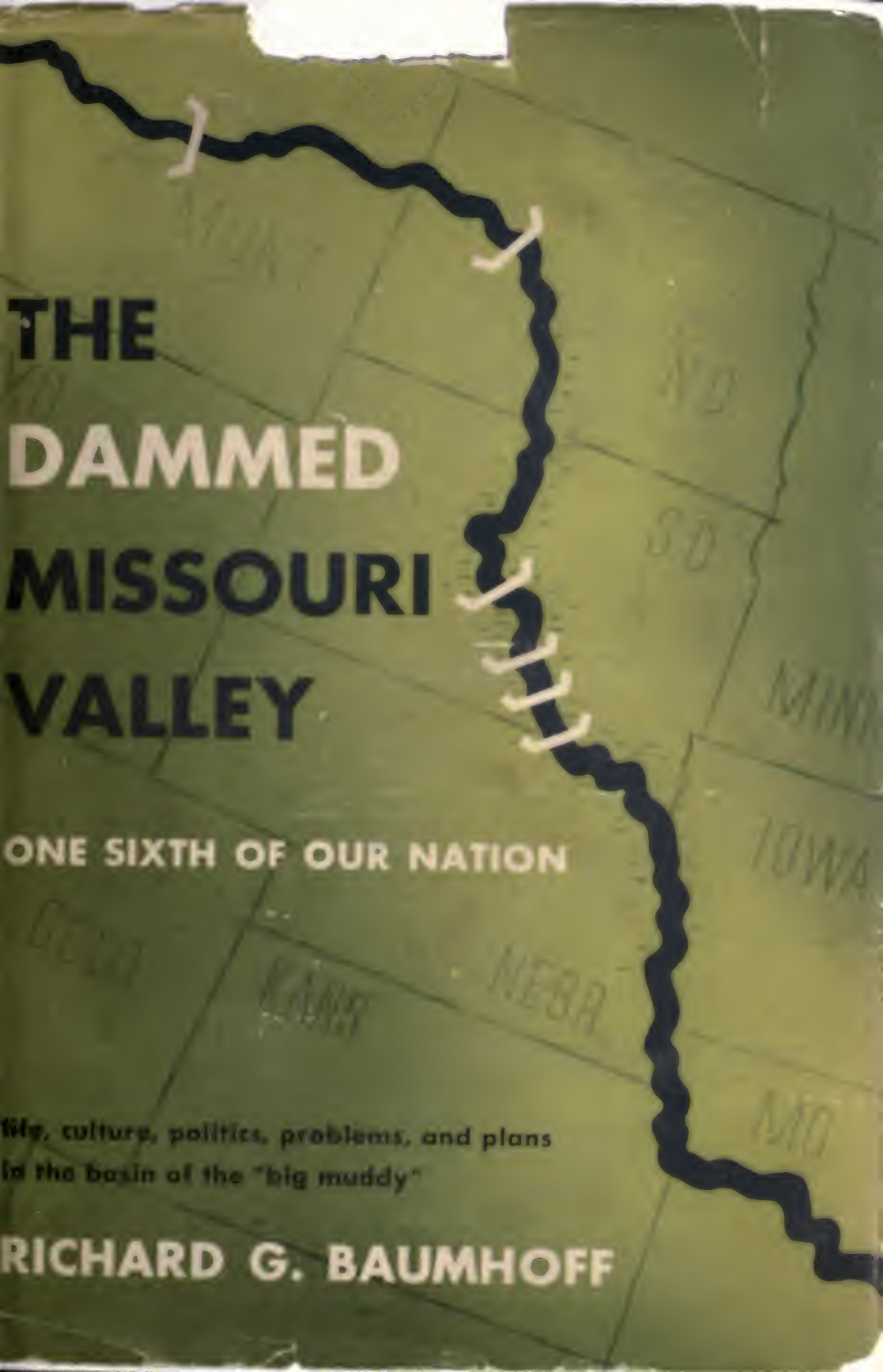
THE
DAMMED
MISSOURI
VALLEY
ONE SIXTH OF OUR NATION
life, culture, politics, problems, and plans
in the basin of the "big muddy"
RICHARD G. BAUMHOFF

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Richard G. Baumhoff

THE DAMMED MISSOURI VALLEY

This rich and living book about the ways of life, the present condition, and the huge problems of Missouri, Nebraska, the Dakotas, Wyoming, Montana, and parts of Iowa, Kansas, Colorado, and Minnesota was written by a star reporter of the *St. Louis Post-Dispatch*. In describing the course of the "Big Muddy" (our longest river), Richard G. Baumhoff, long assigned to cover life and happenings in the block of states within the Missouri Valley, deals authoritatively with the natural forces that have made this area at once a tourist's paradise and a headache for its inhabitants.

This book examines the local, statewide, and federal efforts—some of them gigantic in scope—to pin down topsoil, prevent floods and drought, raise the standard of living, and allow the Missouri Valley to fulfill its great potentialities. Here is a comprehensive and challenging full-length portrait of a vast and fascinating sixth of the United States.

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THE

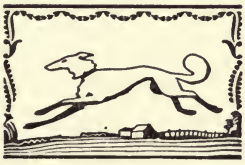
DAMMED MISSOURI VALLEY

THE DAMMED MISSOURI VALLEY

ONE SIXTH OF OUR NATION

BY

RICHARD G. BAUMHOFF



1951

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THIS IS A BORZOI BOOK
PUBLISHED BY ALFRED A. KNOPF, INC.

FIRST EDITION

TO

RUTH, MY WIFE,

WHO, TOO,

LIKES RIVERS

Foreword

A GREAT LEAVEN is working in a big but relatively unknown sector of the United States, the extensive valley of the Missouri River. It has been a comparatively backward region, but much thought and effort and huge sums of money are going into the task of remaking it and bringing it into its own. Thus a new interest in the Missouri basin is growing in the rest of the country. Precedents in regional development are being set there. It is the scene of one of the greatest undertakings the world has ever known, if not indeed the greatest: the improvement and development in entirety of a major watershed. This book is designed to depict life as it is today in the Missouri basin, and to give an objective account of the gigantic program of public works that is under way there, as well as of the inevitable controversies surrounding it. Sincere effort has been exerted to make the account factual and accurate. Statistics are used sparingly, and then generally where they serve to point up the hugeness of the undertakings. This is essentially a journalistic report, not the treatise of an economist or an engineer or a political scientist. A deliberate attempt is made to interlard the items of deeper significance with human sidelights. Chiefly the endeavor is to tell about the people and their problems, their resources, and their aspirations. Since 1945 one of my major assignments, in my capacity as a news reporter for the *St. Louis Post-Dispatch*, has been to "cover" this Missouri Valley program and related topics. I have attended and reported most of the meet-

ings of the Missouri Basin Interagency Committee, which is handling the current program. I have traveled many thousands of miles back and forth in the basin, by airplane, train, boat, automobile, and even horseback, and maybe a mile or two by shanks' mare. This reportorial experience made the book possible.

R. G. B.

Acknowledgments

I WISH to acknowledge with sincere thanks the help of many persons who, in various ways, have made this book possible. Present and past members of the Missouri Basin Interagency Committee, representing both federal agencies and the states, and many of their assistants, have been of invaluable aid. Journalistic colleagues have helped. So have advocates of various points of view in the valley. The publisher and the various editors of the *St. Louis Post-Dispatch* have indulged and encouraged me in the assignment of reporting news of the Missouri Valley. Names of all those to whom thanks are due are too numerous to be listed here, but two persons should be singled out: Sam Shelton, of the *Post-Dispatch*, who pioneered in the Missouri basin assignment, and my wife, an informed and kindly critic, who checked every word of the manuscript and gave wise counsel.

R. G. B.

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ILLUSTRATIONS

THE
DAMMED MISSOURI VALLEY

"FLOOD BULLETIN"

The lower Missouri River basin was scourged by a disastrous flood in July 1951. Crests approached the record levels of 1844. The twin Kansas Citys of Missouri and Kansas were hardest hit, but many other places, large and small, suffered. Worst of all was the flooding of the Kansas River and its tributaries in Kansas, but there was flooding also in the Osage River and in the Missouri below Kansas City. The high water then moved on down the Mississippi River with severe results at St. Louis and below. Record-breaking deluges of rain in Kansas and adjoining states were the principal cause. Damages in the Missouri basin were estimated at one billion dollars, and at least twenty-two lives were lost. More than half a million inhabitants were displaced, thousands of head of livestock lost or stranded, seventeen major bridges in Kansas destroyed, all transportation disrupted, two million acres of fertile bottomland flooded. Immediately the cry went up for more federal money, quickly and in big sums, to carry out existing flood-control plans, said to have been blocked heretofore by strong local opposition. Simultaneously, demands for a Missouri Valley Authority, or something akin to it, were renewed. This book is designed to give an understanding of the great, strange basin that gave birth to this disaster.

CHAPTER I

One River and Four Pairs of Men

VALLEY of contradictions—that is the far-flung Missouri River basin. It holds one sixth of the area of the United States, but only one twentieth of the nation's people. Land of beef and mutton, of gold and a myriad other buried treasures, it is still a region of absentee domination. Natural resources are abundant, but up to now largely neglected. Minor fortunes accumulate there between seasons, but sometimes are wiped out overnight, while opportunity no longer rattles every cabin door.

Water presents the biggest contradiction of all: here too little, there too much. From early frontier days men have fought for it with fist and bullet; the scrap goes on today, but with different weapons—political wiles, interstate diplomacy, budgets, bureaucratic scheming, organized movements. Water is the key to the whole future of this amazing valley. Torrents of water pour from the glacial snowbanks of the Rocky Mountains, trickle from the coulees of the Great Plains, gush from the limestone springs of the lower valley, through brook, creek, and tributary river into the wildly fluctuating Missouri.

This is a land of contrasts. The lower basin, green and humid, sometimes is swept by heavy rains from Caribbean hurricanes. Brown and arid, the upper basin feels the sting

of the Arctic icebox, watches its snow melt away in the warm chinooks from the mountains.

A land of extremes—boundless space, tall peaks, spectacularly vast sky, intense heat and cold, dust that can destroy whole counties, occasional snow that buries dwellings, almost constant wind, big bronzed people, broad human outlook, measurements on the order of thousands of miles, millions of acres, billions of dollars—and, quite commonly, mere dozens of people.

An embattled region of proud, determined, fearless people. For a century and a half they have stood up against Indians, droughts, floods, hail, grasshoppers, all the tricks of the weather, national neglect, nonresident dominance, and a lexicon of economic and political isms.

For all too many Americans the Missouri basin is an unknown land, an inconsequential hinterland. Most of those who have seen it have no more than the fleeting impressions to be gained from hasty passage by airliner or streamliner. They think of it, perhaps, as flat, dull, and dreary. A sojourner may learn that the plains are not as flat as they seem; towns, lakes, and woods may be hidden within the bounding folds. He will have a chance to feel the vibrant spirit of these people. He may, indeed, come to realize that this vast region has a certain compelling fascination, a peculiar lure.

No other major sector of the United States is so obscure to the rest of the nation as the Missouri Valley. Even the deserts of the Southwest, the mountain fastnesses of the West, are better known. In a real sense this basin, at least its bigger western portion, is our last frontier. It holds rosy promise for the future. Since World War II big stuff has

been going on there in a bold and controversial start at remaking the valley physically and economically.

The Missouri basin is a continental funnel draining into the Mississippi River, a terrain that measures 529,350 square miles. It is roughly 1,300 miles long, and has extreme width of about 700 miles. Its top is a 9,715-square-mile slice of the Canadian Prairie Provinces of Alberta and Saskatchewan. The funnel's spout opens into the Mississippi just above St. Louis, Missouri. The sloping eastern side meanders along an almost imperceptible divide in open country. To the south of this basin lie Pike's Peak, the Sangre de Cristo range, the Panhandle, steaming plains, oil fields, the storied Ozarks, and St. Louis, a geographic and historic crossroads of the nation. Outside the basin, in North Dakota, is the geographic center of North America.

Western boundary of the Missouri basin is the Continental Divide, stretching from the sheep crags of Glacier Park on the north past wind-swept Mount Evans on the south. This line crosses Yellowstone Park, where, as in Montana and Colorado, its location is easily spotted along the ridges and spires of the lofty Rockies. But in much of Wyoming the Divide is far less noticeable, for this is just high country, not ruggedly mountainous.

In fact, there is a good-sized place in central-southern Wyoming, not far from the bustling oil town of Rawlins, where the experts don't even know for sure where the Divide is. This is the Red Desert, an area of perhaps 400 square miles, situated more than a mile above sea level. Men who know the country well declare they cannot say with certainty whether the scant moisture of this lonely spot finds its way into the Missouri or into the Colorado.

This desert never has been adequately mapped, they say. Some old maps indicate several creeks running toward the North Platte, a Missouri tributary; but old-timers maintain that there are no such creeks. Almost a true desert, this area has some sparse sagebrush, enough grass for a few sheep, and an active oil field.

Outward from the perimeter of the Missouri basin, water flows variously to the Pacific, to subarctic Hudson Bay, to the tropical Gulf of Mexico and Gulf of California. The Missouri's chief river neighbors are the Columbia, the Saskatchewan, the Red River of the North, the Mississippi, the Arkansas, and the Colorado. Reversals of the plan of nature are on the federal planning-boards and in one notable instance already in effect. That instance is the under-mountain diversion of Colorado River water into the Missouri Valley; the plans contemplate a similar shifting elsewhere from the Colorado and the Arkansas and, conversely, from the Missouri to the northern Red.

An hour's travel by air northwest from the Missouri basin leads to the Columbia ice fields, whose outer melt follows, in order, the Athabaska, the Slave, and the Mackenzie to the sea beyond the Arctic Circle. Flight for an hour southeast from the Missouri basin reaches the Tennessee Valley, which impinges on the land of peach and magnolia blossoms. Pivot the Missouri basin on its nozzle near St. Louis: shifted at various angles, the basin would reach to Hudson Bay, the Gaspé Peninsula, beyond Havana, Cuba, below Mérida, Yucatán, out to Boulder Dam, or well into the Mexico of Pancho Villa. Such geographical day-dreaming helps to fix the size and importance of the Missouri Valley.

Ten states share this basin, yet only one of them, Nebraska, is wholly within it. Half of Missouri is in the basin, forming the triangular spout of the funnel. With Missouri in the eastern tier are the whole western edge of Iowa and a little southwestern corner of Minnesota. Next, with Nebraska, are roughly the northern half of Kansas, virtually all of South Dakota, and the southwestern two thirds of North Dakota. The western tier consists of the northeastern quarter of Colorado, most of Wyoming (omitting a large southwestern triangle), the greater part of Montana, and the little bite into Canada.

In such a valley you might expect the principal river to be the central feature, flowing down the middle. Not so with the paradoxical Missouri. It hugs rather closely the northwestern, northern, and eastern fringes of its basin until finally it is centralized in its swirling, mud-laden run as it cuts across the state that is its namesake. As the stream flows, the Missouri is almost twice as long as its basin. The nation's longest river, it twists and bends for 2,465 miles from its source at Three Forks, Montana, to its mouth above St. Louis.

Three Forks, a pleasant spot in a big cup or mountain park, is named for the trio of streams that join there to form the Missouri. These are the Jefferson, the Madison, and the Gallatin. Actually, the Jefferson is a catch-all draining a long, curving, mountainous rim through a series of subsidiaries. Its main course, nearly 400 miles long, takes in also the Beaverhead River and Red Rock Creek, which starts where Idaho is at the southern border of the Missouri basin.

Both the Madison and the Gallatin rise in Yellowstone


ALBERTA
SASKATCHE
MILK R.
MISSOURI RIVER
FORT PECK
Great Falls
HELENA
CANYON FERRY
MONTANA
YELLOWSTONE R.
Billings
BIG HORN R.
BIG HOLE R.
BEAVERHEAD R.
JEFFERSON R.
MADISON R.
GALLATIN R.
RED ROCK CR.
CONTINENTAL DIVIDE
BIG HORN MTS.
BELLE FOURCHE R.
Rapid City
BLACK H
CHEYE
WYOMING
Casper
NORTH PLATT
CHEYENNE
Greeley
SOUTH PLAT
DENVER
IDAHO
UTAH
COLORADO
N.
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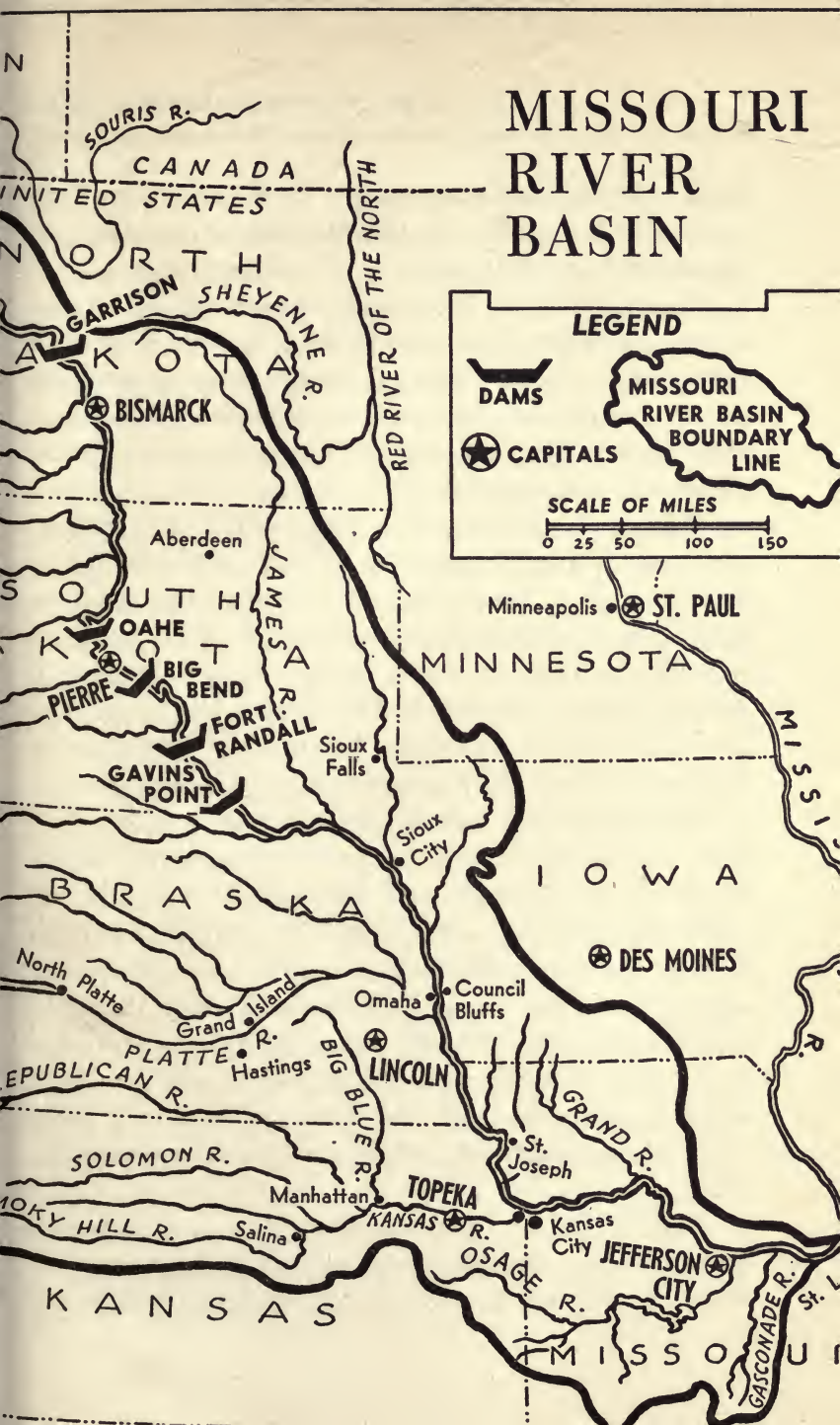
S.


MISSOURI RIVER BASIN
LEGEND
DAMS
CAPITALS
MISSOURI RIVER BASIN BOUNDARY LINE
SCALE OF MILES
0 25 50 100 150
SOURIS R.
CANADA
UNITED STATES
NORTH DAKOTA
GARRISON
SHEYENNE R.
BISMARCK
RED RIVER OF THE NORTH
Aberdeen
JAMES R.
SOUTH DAKOTA
OAHE
BIG BEND
PIERRE
FORT RANDALL
GAVINS POINT
Sioux Falls
Sioux City
Minneapolis
ST. PAUL
MINNESOTA
MISSI
IOWA
DES MOINES
NEBRASKA
North Platte
Grand Island
PLATTE R.
Hastings
Omaha
Council Bluffs
LINCOLN
BIG BLUE R.
REPUBLICAN R.
SOLOMON R.
Manhattan
TOPEKA
KANSAS R.
St. Joseph
GRAND R.
Kansas City
JEFFERSON CITY
OSAGE R.
SMOKY HILL R.
Salina
KANSAS
MISSOURI
GASCONADE R.

Park, in Wyoming. Oddly enough, not far away from their sources the Missouri's main tributary, the Yellowstone, cuts spectacularly across the park.

Tributaries of the Missouri, as a whole, are like a transcontinental ladder, for most of them flow from west to east across the basin. There are not very many of them, for so vast a terrain—an indication of its aridity. In Montana there are only three branches of importance other than the Yellowstone; their names will be foreign to many readers: the Marias, the Milk, and the Musselshell. The Yellowstone, which actually enters the Missouri just inside North Dakota, picks up the Big Horn, the Tongue, and the Powder. Below it in both of the broad Dakotas the list consists only of the Little Missouri, Knife, Heart, Cannonball, Grand, Moreau, Cheyenne, Bad, White, Big Sioux, and James. The James is the only tributary of importance on the eastern side of the Missouri in the upper basin.

Nebraska puts in just two important streams, the Niobrara and the Platte, whose upper branches come, respectively, out of Colorado and Wyoming. Iowa gives the Little Sioux and the Nishnabotna. From Kansas comes the river named after it, familiarly called the Kaw, which is an aggregation of the Smoky Hill, Saline, Solomon, Republican, and Blue. Missouri adds to the main stem chiefly the Grand and the Chariton from the north, and the Osage and the Gasconade from the south and west; but these often carry far more water than many of the western tributaries.

Most of the water that nourishes, plagues, or tantalizes the basin comes from the melting snows of the mountains. Some comes from the snowfall on the plains, usually not

very heavy. The terrific blizzards that buried a vast chunk of the plains country early in 1949 were one of those rule-proving exceptions. Much of the rather sparse rainfall frequently occurs in concentrated doses. The fact remains that the mountains produce most of the water that eventually works its way across the valley and into the Mississippi.

From the last snow of spring until the first of fall, the deep piles of snow high on the mountain ranges slowly trickle away. The drops plunge down the mountainsides, often in miniature falls, charge over the rocks of the high, steep brooks and creeks, and gather in the rivers. Under the blazing sun it would seem as if the winter's snowpiles must disappear in a hurry. But up there above timberline, often between 11,000 and 14,000 feet above sea level, there are cold winds and short days, and the snowbanks are many feet thick. So the melting goes slowly on. Hundreds of miles to the east the gathered waters may make or break man's puny efforts.

Properly controlled, that water can irrigate more farms to grow more food for the increasing population of the country and to meet the rising demand on Uncle Sam to help feed the world. It can generate electricity in huge blocks to light the farms and towns and to power the new industries that might transform the economy of the basin. It can fill the water-consumption demands of the cities and the factories; it can serve the needs of downstream towns now faced with sanitary problems. It may aid navigation in the Missouri and even in the lower Mississippi. In short, this water can help make the valley of contradictions into a rich and useful land.

Along with the water, the soil and the forests must be preserved. Too much of the fruitful topsoil has vanished under the onslaught of wind and uncontrolled water and has been jeopardized by unwise grazing of cattle and sheep. Too much forest has been ruined by wanton cutting. Below the thin life-giving surface of topsoil lies a rich and varied storehouse of base and fine minerals which, surprisingly, man has exploited so far only in rather limited fashion.

Outside the few cities and the relatively few larger towns the population of the Missouri basin averages only about nine persons per square mile. Indeed, over the greater part of the lonely state of Wyoming there is less than one person per square mile. By way of contrast, the most crowded neighborhoods of New York City probably have more than 30,000 persons per square mile.

Another idea of the vastness and the loneliness of the Missouri basin may be conveyed by a check of the bridges crossing the big river itself. From the mouth back to the precipitous falls in the Missouri near Great Falls, Montana, there are just 66 bridges over a distance of almost 1,900 miles. Two thirds of these are in the first 760 miles, between the mouth and the present head of navigation, Sioux City, Iowa. There are only 16 in the Dakotas, and 5 in Montana. Of all these crossings, 37 are for highways, 24 for railroads, 2 for pipe lines. That leaves 3 others. One is the contractors' work bridge at Garrison Dam, North Dakota. Another is Fort Peck Dam, Montana—but when you cross it from the north you come to a dead end at the south, with nothing but many miles of wheat fields and dirt trails ahead. The third belongs to the Department of Justice,

connecting Leavenworth Prison, in Kansas, with a prison farm in Missouri.

In the Dakotas and Montana the bridges lie, on an average, more than 50 miles apart, in contrast with the numerous crossings of rivers like the Connecticut, Hudson, Delaware, upper Mississippi, or Sacramento.

Discovery of the Missouri River is among the earliest records of the white man in the vast intermountain country between the Atlantic and Pacific seaboards. It occurred in 1673, or 181 years after Columbus came to America. Yet another 131-year period was to elapse before there was any real effort to explore or develop the Missouri basin. Thus the real history of the valley has been less than a century and a half in the making.

Four pairs of men have figured prominently in the history of the Missouri basin: Marquette and Joliet, Jefferson and Napoleon, Lewis and Clark, Pick and Sloan. In the summer of 1673 two Canadian explorers came down the Mississippi from the north. They were Father Jacques Marquette, Jesuit missionary, and Louis Joliet, trader. Suddenly, round a bend, they came upon a roaring torrent joining the Father of Waters. It was the Missouri, muddy and evidently in flood.

Marquette set down in his journal: "I have seen nothing more frightful. A mass of large trees—real floating islands. They came rushing so impetuously that we could not, without great danger, expose ourselves to pass across."

St. Louis, first outpost of the West, was founded in 1764 by a French merchant who came up the Mississippi from New Orleans. In the years since Marquette and Joliet, adventurous French fur traders had worked their way up

the Missouri by boat, but their exploration had been limited and they made no real impact on the development of the beautiful and terrifying wilderness that engulfed them, or on the roving Indian tribes scattered over it. They were significant as forerunners of the great fur trade on the Missouri which lured the Chouteaus, the Sublettes, and others from St. Louis, the Astors from the East.

It was Thomas Jefferson, third President and far-sighted statesman, who acquired the Missouri Valley for the nation. He sent his representatives to the ministers of Napoleon, thinking only to buy the lower Mississippi region to assure a Gulf coast outlet. Napoleon, ever in need of funds, made a deal instead to sell the whole Louisiana Territory to the United States for about two cents an acre. This was in 1803, the first territorial accession to the original thirteen colonies, and the biggest addition ever made to the country. The Missouri basin constituted not quite two thirds of the entire Louisiana Purchase. The other third consisted of the land to the south, bordering the Mississippi, the rest of Iowa, and a considerable part of Minnesota.

Now was the time for exploration of the new land, a challenge to the adventurer, the entrepreneur, the patriot, and him who was merely restless, a lover of the wide-open spaces. Jefferson obtained from Congress an appropriation of $2,500 for an expedition to the Northwest. Two early captains in the Army Corps of Engineers were assigned to the task: Meriwether Lewis and William Clark. They organized a force and set out in May 1804 from a point near the Missouri's mouth. Their journey led to the upper Missouri, across other parts of the basin, and on out to the

Pacific coast. They returned to St. Louis in September 1806 laden with facts and stories about this newest outpost of civilization, which they reported in writing in great detail.

By 1821 Missouri had been admitted to the Union. Next came Iowa in 1846, Minnesota in 1858, and Kansas, on the hot breath of civil war, in 1861. Nebraska was established after the war, in 1867; Colorado, the "centennial state," in 1876. Both Dakotas became states on the same day in 1889, Montana six days later. The last of the basin states, Wyoming, was created in 1890.

Three quarters of the nineteenth century was spent in wresting much of the Missouri basin from the Indians, who, oddly, clung to the old-fashioned notion that the land was theirs and the white man an invader. Alexander Graham Bell had already patented the telephone and Captain James B. Eads had opened his famous bridge across the Mississippi at St. Louis when Custer's Last Stand occurred. This was the Battle of the Little Big Horn in southern Montana between the Big Horn and the Tongue rivers.

Slowly over the years progress has been achieved, but in many ways it has advanced less far in the valley of contradictions than elsewhere. True, the airplane, the electric eye, the slot machine, and the unicameral legislature all have moved into the basin, along with a lot of other things good, bad, and indifferent. As World War II was brewing, people of the basin realized the necessity of composing historic differences over the treatment and use of their fundamental resource, water. It was then that the fourth pair of men came onto the scene.

Lewis A. Pick, then a colonel heading a division office of

the Corps of Engineers at Omaha, Nebraska, drew up a relatively short study and report for the basin, dealing particularly with navigation and flood control, of interest especially in the lower part of the valley. Meanwhile, William Glenn Sloan, at that time an assistant regional director of the Federal Bureau of Reclamation at Billings, Montana, had been working on a long, elaborate study, dealing essentially with irrigation and kindred matters in the upper valley. Mr. Sloan hastened to issue his report after the Pick report was filed. The result, frequently called a "shotgun wedding," was the Pick-Sloan plan, signed into law by President Franklin D. Roosevelt late in 1944. This has grown into the even larger and more ambitious so-called Interagency plan, a multi-billion-dollar undertaking to conserve the water and the soil and make the basin over. Among other things, the plan calls for more than a hundred dams of varied purpose on the Missouri proper and its many tributaries, from one end of the valley to the other. Inevitably, it is a controversial enterprise, for in one way or another it touches on most of the major facets of life and many of the minor ones throughout the basin.

This is the second big development in the nation to be initiated with a major river basin as the unit. The first, of course, is the successful Tennessee Valley Authority, which has transformed its relatively small region. TVA was the outgrowth of years of urging by the late Senator George W. Norris of Nebraska. It was created in 1933 as one of the early steps in President Roosevelt's New Deal.

An interagency setup similar to the one in the Missouri basin has been in existence for several years in the Columbia valley. In opposition to this plan, there has been an abor-

1. *Three Forks, Montana, source of the Missouri River. Jefferson River (foreground) here joins the Madison and the Gallatin, which come from the Yellowstone peaks of Wyoming. The Missouri begins its long career in the upper left hand corner of this picture.* Paul Berg, *St. Louis Post-Dispatch* PICTURES.

2. *Missouri Point. Here the Missouri (lower righthand corner) flows into the Mississippi. Beyond the Mississippi lies Illinois.*
Lloyd Spainhower, *St. Louis Post-Dispatch.*

tive push, with strong backing in Washington, to establish a Columbia Valley Authority. Meanwhile the movement for a Missouri Valley Authority, which was lively in the 1940's, has simmered down. Recently a third federal interagency scheme has been started in the Arkansas River basin, and a fourth in New England. An interstate compact is dealing with the knotty problems of the Colorado River. Incodel, a co-operative interstate movement, is working on the Delaware River. There have been perennial tentative moves in Congress to divide the nation into nine major valleys for purposes of resource management.

While there are those who fear that any type of federal agency dealing with a valley region is a serious threat to states' rights, it seems clear that the watershed of a great river is a logical basis for dealing with the fundamental resource of water and with related resources. This point of view was backed by many of the findings of the Hoover Commission on Governmental Reorganization and by President Truman's Water Resources Policy Commission. It has been espoused repeatedly by President Truman in his speeches. Now war and the threat of war have lent urgency to the demand for continued development of the Missouri Valley.

It is a striking thought that the river, which, next to fire, made probably the greatest imprint on the rise of culture from prehistoric times, persists today, in the age of the atomic bomb and the jet plane, as a leading factor in man's destiny.

CHAPTER II

Tobacco Root to Missouri Point

ALTHOUGH it springs from the nation's rugged mountain backbone and drops to the Midwestern trough of the continent, the Missouri River itself is not precipitous. At Three Forks, its source, the Missouri is at an altitude of just over 4,000 feet above sea level; at its mouth, near St. Louis, it is just under 400 feet. Thus the average drop is not quite one foot and one half per mile for the entire distance; it is less than one foot for the lower end. There is a series of low, rocky falls in the stream near Great Falls, Montana, which marked the upper end of early-day navigation.

The Bay of Fundy, in Canada just beyond Maine, is noted for its remarkable tide, which has been reported to fluctuate as much as 62 feet. But the Missouri River has a record range in level of 39 feet at Kansas City, without tide —just the difference between a superabundance of water in flood time and a dearth in dry season. Offhand, a vertical distance of 39 feet does not seem to be an impressive statistic. Yet translated to horizontal and volumetric terms, it represents the difference between an almost insignificant trickle of water in a muddy stream bed and a vast, destructive flood spread across miles of bottomland and swirling through the buildings of city and town.

The trickle at low stage may be only a few feet wide. In contrast, General Pick has told of standing on the bluff at

Arrow Rock, Missouri, in one of the big floods of the middle 1940's, when the river seemed to him to extend for ten miles across the fertile bottoms. At Bismarck, North Dakota, in the drought times of the 1930's, residents told of riding bicycles across the dry river bottom. When an ice jam broke at a later date, the Missouri burst out of its earthen gorge at Bismarck with a rush of water.

Army engineers have estimated that the greatest flow of water in the Missouri River was at the rate of 892,000 cubic feet per second, at Hermann, in eastern Missouri, in the great flood of June 1844. This form of measurement means that water flowed past a given point in the volume stated within the tick of a second. Put another way, it means that water passed Hermann at the height of this inundation at the rate of 34½ trillion gallons daily. Cut the estimate in half and it is still a fearful lot of water—New York City was consuming only 1⅕ billion gallons daily at the time of its recent shortage scare.

The lowest flow of record at Hermann was 4,200 cubic feet per second in January 1940. This was less than one half of one per cent of the estimated maximum, yet it was at the rate of almost 163 billion gallons per day, enough for 135 New York Cities. The contrast in flow is relatively just as great on the Missouri's tributaries. An Army Engineers tabulation shows a string of zeros for the minimum flow recorded on some of these. A notable contrast can be found for one tributary, the Republican River, at Bloomington, on the southern Nebraska border. Maximum flow of record there was 260,000 cubic feet per second in June 1935; minimum was seven cubic feet per second in October 1937.

Naturally, volume affects speed. In the presently navi-

gable lower Missouri the current ranges from two miles per hour at time of low water to seven miles in flood time. In this automotive era a seven-mile speed sounds like something from horse-and-buggy days. Just try breasting that current, however, with oar, outboard motor, or even the Diesel-powered screw propeller of a modern towboat. Or ride it downstream in a launch for exhilaration.

The normal volume of the Missouri builds up bit by bit as branch after branch joins the parent stream. River by river, all the way down the basin, the Missouri collects its torrent. Flood volume may show up at any section along the whole course. Floods may be highly localized or they may extend for hundreds of miles, rolling inexorably down the valley. They may be caused by chinooks or other sudden thaws or by heavy rains, unusual snows, or the breakup of ice jams. One of the curses of this valley of contradictions is that in the areas of limited precipitation much of the rain that does come often descends in concentrated deluges, rather than in nicely timed showers—none of that gentle and timely rain from heaven; too often heaven sends gully-washers when what this country needs is sod-soakers.

The finest way to see the Missouri River is to fly its tortuous route. The aerial view gives an excellent picture, helping the onlooker to grasp the significance and problems of the stream and its basin. Few persons, of course, have had the opportunity to fly this roundabout course. Even many of the federal engineers assigned to deal with the river have seen it from the air only in piecemeal fashion.

Three Forks, where the Jefferson, the Madison, and the Gallatin come close to having a common confluence to form the Missouri, is a pleasant, broad, sheltered cup in the

Rocky Mountains. The irregular lowlands bordering the streams are verdant. Around them the higher ground may be patched alternately with the pale gold of wheat and the brown of grassland. Some of the surrounding mountains are barren, but the slopes of the Continental Divide to the west and south are forested thickly with lodgepole pine and other growth. Circling this cup, the summertime aerial visitor is likely to pass close to snow-topped peaks of the Tobacco Root range in a temperature that may be below freezing at that altitude in spite of brilliant sunshine. These Tobacco Root Mountains, northwest of Yellowstone Park, rise prominently to the south of Three Forks. Dotted among them and the adjacent ranges are numerous pretty lakes in rocky holes and typical mountain "parks," pleasant clearings among the crags.

At its outset the Missouri flows north, leaving the valley of its source through a defile. For a hundred miles or so it cuts through mountain country; to its west the Divide curves between Helena, which is in the Missouri basin, and Butte, the copper city, outside it on the western slope; to its east lie the Big Belt Mountains, a wild, rough, rather low range. Here the Missouri is a clear, clean river winding through lightly wooded hills that run to 7,000 or 8,000 feet. In this stretch are to be found one local irrigation dam that is hardly more than a weir, three old private power dams, and, rising in a gorge, the construction work of Canyon Ferry Dam, one of the new federal projects.

At the Gates of the Mountains the river slips out of the rocky land whence it sprang, zigzagging, between high, rocky cliffs, marked here and there with imprints of an earlier race of man. As you look back upstream, you can

see why the first explorers called this place the Gates of the Mountains, for suddenly there is an illusion that the rock does unhinge to let the river through.

Then there is a startling change. The river emerges onto a plateau, where it follows an exaggerated serpentine pattern for miles between gentle, low banks whose immediate vicinity is green and pleasant. From the air you are reminded of pictured scenes along quiet English brooks, until the eye grasps the hundreds of thousands of acres of the plateau, used to a great extent for raising wheat.

The wheat fields form a geometric pattern of huge stripes. This reflects a practice widespread in Montana, followed to some extent in the Dakotas and Wyoming, but not extensively used elsewhere in this country, which is said to have originated in Canada more than thirty years ago. The practice is wind-stripping, whereby alternate strips of equal width are laid out to defeat the erosive effect of wind. One strip lies fallow for a year, while the next one is planted to wheat, and so on; the next year this usage is reversed. The effect tends to hold the thin, vital layer of topsoil in place and, agricultural specialists contend, to yield more grain in the long run than if the entire area were planted simultaneously. On this plateau the strips are 20 rods (330 feet) wide, and their length, which may be well in excess of a mile, is limited only by ownership or topography. A single wheatgrower may own thousands of acres.

The red brick smokestack of a metal mill at Great Falls looms big in spite of the Gargantuan landscape. It is almost big enough to slip like a mailing tube over the Washington Monument. Next you see, in succession, Black Eagle Falls,

Crooked Falls, Rainbow Falls, and the 96-foot Great Falls, for which the city is named. Here, some hydroelectric power is generated. The falls are gradual rocky drops rather than spectacular plunges of water, and they are in a gorge whose coarse, gravelly soil has eroded in great fissures back into the plains. Soon, in the flight downstream, you see how silt is beginning to discolor the river: the start of the Big Muddy. In the dry season, when the power dams are storing much of the river's flow, the stream may degenerate into slimy green stretches of shallow, stagnant water streaked with sandbars.

Across north-central Montana the path of the Missouri is a big gully in the badly eroded plains, which seem from aloft to be vast, lonely, and forbidding. The reservoir of Fort Peck Dam, an Army project dating from the public works program sired by the depression of the thirties, is another of the basin's sharp contrasts. It is a deep man-made lake over one hundred miles long which can be in turn shimmering and blue or green, white-capped from the wind, or frozen in thick, rough ice. The dam is a four-mile-long pile of earth flung up by dredges. Its rock-faced upstream side has been known to teem with rattlesnakes. Excess water released from the reservoir runs through a mile-long concrete spillway.

Beyond the dam the river twists through a more inviting and agricultural terrain. The lowland appears gentle and green in summer. The billowing plains all around are in green, gray, tan, and gold. In this sector can be seen a fine example of a special twist in soil conservation: contour wind-stripping, in which the alternating stripes of the wheat fields make a crazy-quilt design because they bend to fol-

low the varying levels of the land. Sometimes the river here may look like coffee-and-milk; at other times it may assume a blackish cast.

Just after the Missouri crosses into North Dakota, it is joined by the Yellowstone, which at this point normally carries a greater volume of water than the Missouri itself. Nature has given the Yellowstone's mouth an unusual form: it points back upstream against the Missouri. Nature also has played the Yellowstone a dirty trick by filling it with silt. In its upper reaches the Yellowstone is a sparkling, tumbling, crystal-clear mountain stream, but its lower end carries churned-up soil of Wyoming and Montana in great volume. In fact, at the juncture of the Yellowstone and the Missouri the Yellowstone's silt load appears heavier than the Missouri's. From the air the two muddy streaks are seen to mix slowly together; for a little way they look almost like two separate flows within a single channel. This phenomenon is not unique, being duplicated where the Big Horn enters the Yellowstone and where the Missouri joins the Mississippi.

In both northeastern Montana and northwestern North Dakota the Missouri crosses long stretches of rather flat land, where it can spread out placidly in broad reaches and lazy bends. Come high water, the banks may cave in, producing new silt. The river may even change its course markedly in terrain like this. Indeed, it is a surprise to see from your plane the vestiges of old oxbow loops in these corners of Western states. You may have thought that such loops occurred only in the alluvial bottoms of the lower Missouri and the lower Mississippi. Yet the pattern here is the same as you are to see later in profusion as you fly along

the Missouri River in Iowa, Nebraska, Kansas, and Missouri: an elliptical lake or swamp, or maybe just a tracing on the ground. Viewed from above, these places stand out like the proverbial sore thumb as former courses of the river. The shifted and usually shortened and straightened stream has left them stranded anywhere from a few yards to a mile or more from the present bank.

The oxbows occur mainly between the "gorge country" and the "bluff country"; that is, between the mouth of the Niobrara in northeastern Nebraska and the mouth of the Grand in western Missouri. They are to be found, however, a few miles northwest of St. Louis, where they form a once popular suburban lake and two duck-hunting marshes. Some of the notable oxbows below Sioux City, Iowa, were formed before Army Engineer records were started about 1880.

The Missouri and its surroundings are relatively devoid of colorful detail across North Dakota. The countryside is a mixture of grain fields and rough grazing land. The river's banks are rather low, but the stream pursues a definite declivity in the rolling plains. The river bottoms in general are heavily wooded, running strongly to the familiar cottonwood tree. Near the center of North Dakota a huge operation has passed the halfway mark: the ten-year job of building Garrison Dam, at a cost already estimated as likely to be at least $268,000,000.

In South Dakota the surroundings of the river are rougher and wilder. Along the northwestern quadrant the country is barren. At low stage many sandbars show up in the river. Here, and in fact all the way from the mountains to western Missouri, the tributary streams, almost without

exception, have cut sinuous courses, as in geologic time they have sought out the softest and easiest way in their blind groping for the distant sea. The Missouri itself has carved a deep gorge through shale and other materials in much of southern South Dakota.

Now in flat and semi-humid country, the Missouri for a hundred miles or so constitutes the eastern border of South Dakota and Nebraska. Here the stream is uncontrolled and shifts at will. You can see where the channel has bitten off a chunk of good farmland from one bank, while on the other side a sandbar starts in the erstwhile path of the channel. Soon it will be an island and some day it will join the mainland. Such shifting can be stopped by man, but not through puny measures or local action. It calls for federal work costing many millions of dollars, plus constant maintenance, for the Missouri, like the jungle, can revert to natural state in a hurry.

The Missouri has been pretty well stabilized from Sioux City, Iowa, at the bottom corner of South Dakota, to the mouth. This stabilization is a notable by-product of the Army's long efforts to establish a navigation channel in this stretch. But during World War II both initial improvements and annual maintenance were thrust aside. One day after the war an Army engineer was flying over the mouth of the Little Sioux River, where the banks were caving and both streams were running wild. "Isn't that a hell of a sight!" he exclaimed in the tones of a man who likes his rivers neat and tidy.

All the way from Sioux City to Kansas City the Missouri is a boundary between states, Nebraska and Kansas on the west, Iowa and Missouri on the east. It wanders over a

flood plain between low, wooded bluffs that sometimes are several miles apart. In northern Iowa these hills have odd conical shapes, as they are of loess, "an æolian deposit"—that is, fine wind-borne earth. These bluffs of Iowa may once have been the topsoil of the Great Plains. Between the highlands, as the oxbows testify, the river often has changed its route.

Sometimes when that has happened the Missouri has assailed state sovereignty and cut off normal access to land, to say nothing of playing hob with county taxable values. For the great river cares naught for political boundaries. As recently as August 4, 1950, President Truman signed a bill giving the consent of Congress to the rectification of an ancient boundary dispute between Kansas and Missouri. The *St. Joseph Gazette* reported that Missouri got the big end of the bargain, by which 10,000 acres changed states. Kansas relinquished 5,000 acres of land on the east side of the river in one spot and 1,800 acres in each of two other spots; it gained in return only 1,400 acres on the west side. The compact fixed the interstate boundary as the center of the river from the Nebraska-Kansas line at the fortieth parallel to the mouth of the Kaw at Kansas City. Barring an act of God and allowing for regular appropriating acts of Congress to keep the stream of maintenance funds flowing, the solemnly arrived-at boundary should remain fixed for a while.

Pigeon Creek Bend is a broad curve in the Missouri above Omaha, Nebraska. There you can see from aloft that the river has had five distinct channels within fairly recent times. Three of the old chutes, now tree-covered sloughs, are on the Iowa side. The 1947 flood poured over a dike

at the head of a chute on the Nebraska side and reopened that course. The main channel, for a wonder, stayed put that time. As a result of this wandering, a sizable chunk of river bottom belongs to the willows and the marshes and their wild denizens.

The only large cities of the whole Missouri basin which are on the Missouri River are Omaha, the twin Kansas Citys, Sioux City, and St. Joseph. They are among the eight largest cities of the valley. Army flood walls and levees at Omaha and the Kansas Citys clearly delineate the means of confining the river in populous centers. The most striking showing of the Missouri's straitjacket, however, is to be seen looking down on open country along the lower river. There you can observe how the system of pile dikes—curving fences of stout timber pilings—stone revetments, willow mattresses, and short "wing" dikes succeeds in pinning down the channel and giving permanence to the banks. This is a fascinating sight, for it discloses uncanny precision in converting blueprints into reality with simple weapons and the power of a little floating machinery against the relentless river.

Even so, nature is still boss. You can spot heavy piles that have been sheared off, as by a giant knife, where an ice gorge broke loose and shot downstream. That happened, for instance, at Iatan Bend, Kansas, in 1949, when the ice swept like a glacier for a distance of more than five miles along a path half a mile to one mile wide in the rich bottomland of two counties. Several thousand acres of wheat were laid waste.

With their channel work, the Army Engineers can put the stream where they want it. Not many years ago a mod-

ern highway bridge was erected at South Omaha largely on dry land. Then the engineers diverted the river to run under it. They decided to eliminate Liberty Bend, a long loop below Kansas City, so that flood waters could move out faster and they could therefore reduce the height of the protective works needed in the city. There again a new bridge was constructed on dry land. If you could have been in one of the circling airplanes the spring day when a levee plug was blown up, you would have seen the brown water trickle, then spurt, then race greedily through the straight new channel. Every time you flew past in the next few months you would have seen the new route widened still more, the old one gradually disappearing. Now you cannot be too sure at first glance that the river ever did move through the old channel. Silt has filtered through the constricting works and created fresh land along the loop.

There is a long series of S-shaped bends in the river at St. Joseph. Some of the Army Engineers would like to knock out one of the loops at the northern edge of the city. This would shorten that stretch from nine miles to two and one half miles. It also would be equivalent to tossing the St. Joseph airport and surrounding farmland into Kansas. St. Joseph is not likely to stand for this without a loud, anguished howl that would be heard as far away as Washington. The school favoring the change suggests that reduced maintenance costs would pay for the work in thirty or forty years. On the other hand, one Army man looked lovingly at the meandering river as he flew across the bends, and growled: "We spent fifty years putting in the revetments to hold those curves. Wouldn't it be kind of foolish to knock them out now?"

At Kansas City the Missouri turns east again and bisects its namesake state. The normal channel widens to a quarter of a mile or more as additional tributaries pour in. Now the river is in the middle of its broad flood plain, now at the northern bluff, now at the southern bulwark. In the western part of the state Sunshine Lake stands out as a reminder of the biggest shift of the river within the memory of man. Many years ago the river hugged the little town of Camden, on the north side. It got into one of its wild, wandering moods and wound up five miles south, alongside the village of Napoleon.

You look for the mouth of the Chariton River, coming down from Iowa across north-central Missouri. It is hard to find. An Army man explains: "That mouth wanders all over." For years now the Army has been seeking to control the Chariton, but Congress has concluded repeatedly that this was one little job that could be put off. You see the mouth of the Osage, which flows parallel to the Missouri for many yards, separated only by a narrow strip of low land from the main stem, before they actually converge. The Osage—which starts in Kansas as the Marais des Cygnes, or Swan Marsh, River and gathers much water in the Ozarks—used to enter the Missouri at a right angle. About 1933 it changed this contact by some riparian quirk.

Through central and eastern Missouri the bluffs rise taller and the scenic grandeur increases. This stretch rivals the palisades of the Hudson or the upper Mississippi. The vegetation changes, too: now the cedar, the hawthorn, the oak, the dogwood, and the redbud, the hickory and the walnut, the elm, and other trees clothe the hillsides in seasonal splendor.

As the suburbs of St. Louis come into view, you see modern houses, even mansions, on the hilltops. In western St. Louis County only an eight-mile neck of high ground separates the Missouri from the Meramec River, which flows into the Mississippi. The continental funnel is tapering into its spout. Only a fringe of this county is in the Missouri basin. The city of St. Louis, which is at least the historic capital of the basin, actually is outside it, though it reaches within three miles of the basin's edge.

Now, at last, you see Missouri Point, a long, narrow tip of St. Charles County, Missouri, between the Mississippi and the Missouri. In Indian days this was the Portage des Sioux, where nomad bands carried their canoes overland about two miles to save paddling perhaps thirty-five miles. Repeatedly in modern times Missouri Point has been inundated when the two rivers joined in flood across it. You might expect to find something especially spectacular at the normal confluence of the country's two greatest rivers. If so, you will be disappointed. It is entirely within an area of flat, low land, partly wooded, but also dotted with farm fields. Only as seen from the air does it approach the character of a notable scene. Although it is well within a great metropolitan district, with big power plants and factories not far away, the confluence is virtually inaccessible by land. No decent road goes near it. The very tip of Missouri Point is a tiny, squat island—a far cry from the majesty of the Tobacco Root range.

CHAPTER III

High, Lonely, Wind-swept Land

As you travel west from Kansas City or Omaha or Sioux Falls or Fargo, whether you go by automobile or train or plane, but especially if you are motoring, you sense gradual, subtle changes. The great bowl of the sky becomes bigger, more real. The sun, the moon, the stars all shine brighter. Storms are more intense and awe-inspiring, sunsets more brilliant. The earth spreads out in ever increasing panoramas. Cities and towns are fewer and smaller, but they have in common the advantage of wide streets and a sort of self-sufficient air. The grain elevator and the water tank on a tower are the skyline landmarks of most towns. Step by step the vegetation changes, grows more sparse. An all-pervading sense of loneliness, of the smallness of man, may fill your soul. The whistling wind, a vast black cloud, or a sudden chilliness may induce a foreboding of unknown dangers. Soon, however, you learn to glorify the solitude and to find a strange grandeur in the wide-open spaces.

One subtle change that may take you by surprise is the steady rise in altitude. The prairies and plains are seldom truly flat. They undulate. Your westbound car or train goes downhill frequently, but the chances are the next upgrade will be twice as long. Every hour's travel takes you to a little higher level. The earth has another trick in its repertory in large western and northern portions of the Missouri

basin. There it often is piled in a series of two or three or more levels—a sort of stack of plateaus. Each level is called a bench. From some vantage point you may survey a chunk of countryside and think that you have seen it all. Not so. The trick is that the benches seem to run together and envelop a landmark, a ranch, a lake, or even a town. Everything does not meet the eye. You can get lost among these folds of land in Montana, Wyoming, and parts of the Dakotas and Colorado.

Nature displays countless other tricks and variants. Nebraska has a big western area called the Sand Hills, a name of almost exactly literal significance. North Dakota has numerous miniature ponds, called potholes, formed in ancient times by glacial action. Devils Tower in Wyoming is an unscalable spire of rock. In South Dakota are the famous Badlands, where softer materials have worn away and left fantastic gray shapes of soil and rock exposed over many square miles. Missouri has sinkholes where storm water disappears into the porous limestone substrata. Yellowstone Park has its justly celebrated geysers and fumaroles. Several of the states have buttes—detached, flat-topped hills standing out on the plains; Scottsbluff, near the Nebraska city of that name, is a notable example.

A thumbnail description of the Missouri basin was given in a speech by Brigadier General Samuel D. Sturgis, Jr., who succeeded General Pick as Missouri River division engineer for the Army: "It is a predominantly agricultural region with large areas of relatively steep slopes and lands relatively bare, thus greatly subject to erosion."

That statement typifies vast areas west of the semihumid belt and all the way to the foothills of the Rockies.

Nowhere is this more evident than in Wyoming. Scanning the seemingly boundless reaches of Wyoming from a plane, you are likely to see billowing, almost barren land in brown or gray-green; tentacles of darker, richer green vegetation, spread out dragonwise wherever storm water drains down a slope or a little stream flows; faint trails, hardly more than wagon tracks, winding like the path of least resistance to God knows where; a few scattered habitations; a few towns; gleaming spots, which are stock ponds that help to identify scattered dark dots as herds of grazing cattle; and shining ribbons at long intervals, the blacktop highways or the single-track railways.

The scene is not too different from aloft over the other western states of the basin, except that in the others you are more likely to note the big, scattered wheat fields. The Montana, Wyoming, and Colorado landscapes are likely to be backed by mountain walls capped in snow. Sooner or later you are bound to find a spot where irrigation has worked its magic. Verily, it can make a desert bloom like the rose. Where the canals and flumes and ditches have poured their liquid wonder onto the fields there is verdure. One side of a road will be a wasteland of sagebrush or a primitive grass grazing tract, while the other will sustain sugarbeets, alfalfa, potatoes, small grains, clover, garden crops, and flowers. That is what water does.

It is dangerous, of course, to oversimplify or generalize in an effort to describe such a far-flung, varied region. Just as the terrain changes subtly from east to west across the basin, so does the way of life. In the main, however, these latter variations might be traced from south to north, for to a considerable extent they are a matter of climate. Farm-

houses on the southern edge of the basin, in Kansas, tend to be roomy, with big porches for the summer heat, and large outbuildings. There are silos on eastern Kansas farms, where the corn-hog cycle holds sway as in Iowa. On the outskirts of the towns in these parts a new note is present, the result of national policies of farm economy during recent years: a collection of large, round metal bins to hold the overflow of grains.

Go to the other extreme of the basin, up along the northern edge of Montana. The houses are small and simple, built to withstand bitter cold; there are no barns, often virtually no outbuildings. Up there the wheat and the cattle both move out promptly when their times comes, and the symbol is the livestock-loading chute at the whistle stop. Many of the ranchers have two or three fine automobiles standing at their door, and a lot of modern, mechanized equipment, yet they still live in shacks.

There are other signs and symbols, too. Along the Platte Valley in Nebraska in early autumn the traveler is startled by plumes of lurid green vapor drifting over the prairie. These prove to be fumes from a string of alfalfa mills. Late summer finds open trucks of purple-red beets queuing up to reach the sugar factories of northeastern Colorado, which spread a cloying odor about their neighborhoods.

An unforgettable sight—and sound—in the 1940's, which may diminish hereafter, was the procession of itinerant combines, the harvesting machines, moving north across the wheat prairies with the season. They made one oppressively hot night in August 1947 at Pierre, South Dakota, miserable for a weary traveler who could not sleep for the noise they made. Every few minutes, all through the night,

a combine and its attendant trucks and cars rumbled up U.S. Highway 83 and across the little capital city.

Before World War II the old-fashioned practice of reaping first and then calling in a local threshing crew to separate the grain was in vogue. Then the combine came along. It separates as it cuts, pouring bulk wheat directly into the accompanying trucks, which dash away for the elevator. Always a big business in this bread basket of America, wheat became even more important as the nation took on world responsibilities. The harvest itself became big business. By now a good combine may cost $5,000.

So the itinerant harvesters began to roam the plains. They come from all states and Canadian provinces of the wheat belt. From the early harvest in western Texas they cross the Oklahoma Panhandle and work their way through Kansas, Nebraska, the Dakotas, and adjacent states, and into Manitoba and Saskatchewan, to wind up the season with the threat of frost already in the air. A big-scale grower may have as many as twenty-five combines operating along parallel rows in his lordly fields. If he is smart, he will have his own machine in the lead to set the pace, for a hasty cutting may leave some grain untouched. A North Dakota implement-dealer and landowner said: "I think this practice of itinerant harvesting may wear out. It doesn't pay any longer. They get three dollars an acre now, but awhile back the ranchers were giving them four and a half or five dollars or more in order to get them to pull in and go to work."

Mile-long banners of black smoke trail the steady stream of Union Pacific freight trains over the grades of Wyoming. At night the outskirts of Helena, Montana, are

brightened by the strings of lights on a dredge that steadily turns up gold. In the Black Hills of western South Dakota, a sort of tumbled-off branch of the Rocky chain, is Mount Rushmore with its unique portraits in stone. Corny, the idea seems to some persons, but its rightness appeals as you gaze on those giant visages on the crest of the mountain—Washington, Jefferson, Lincoln, and Theodore Roosevelt. Those calm faces, which should remain for ages, in a way typify the quiet, resolute persistence of the Missouri basin. You look at them and only chuckle at the recollection that in a near-by creek Calvin Coolidge once fished for sated trout planted for his pleasure.

Thomas Jefferson was responsible for something else that left its mark on the Missouri Valley and nearly all the rest of the country west of the Appalachians. This was the surveying system that set up regular "townships" of 36 square miles, "sections" of a square mile each containing 640 acres, and the resultant divisions that cut many land-acreage holdings into fractions of 640. In the irrigating districts, for example, federal law makes the quarter-section, 160 acres, the maximum for use of water. That constitutes the "family-sized farm," in distinction from the vast tracts of big private and corporate dry-farming operators.

This surveying system was set up originally for the old Northwest Territory, which lay east of the Mississippi, but it spread into Missouri and on across the continent. In the flatter districts of Missouri and in the eastern parts of the tier of states to its west the imprint of this system is most clear, for there is usually a road of some sort along each section line, producing a gridiron in mile squares. Nebraska has been perhaps the most determined in following this;

there, even where the land begins to roll in sharp grades, a dusty white stone road will doggedly hew to the line, up hill and down dale. Seen from the air, the fields are checkerboards; the aerial traveler soon understands the significance of the old bucolic phrase about the "back 40." Farther west in the basin, where the land is rougher and the people are fewer, the gridiron seldom meets the eye on the ground, but it will show up in county records and in the faintly outlined townships in atlases. These townships, incidentally, have nothing to do with administration, and are utterly unlike their namesakes in New England.

Most of all, the system has affected the way of farming over a large area of the basin. It bears a not inconsiderable part of the responsibility for the wasting of much precious topsoil. A settler bought his farm in squares and rectangles, and in that form he laid out and tilled his fields. So did his heirs and assigns and those who came after them. So to this very day do all too many of the farmers cling to the old and tried. But wind and water have no sense of the geometric; the wind bloweth where it listeth and the water seeks its level. And the thinning layer of life-giving topsoil is gone with the wind or more often washed down gullies and ravines to swell the silt load of the rivers.

This is no mere academic theory. Take to the plane and see how "square farming" wastes the land. The gullies, like crow's feet, and the thin spots show up in profusion. Fortunately, modern conservation practices have begun to take hold in the basin, but they are a long way still from being predominant. "Conservation farming" ignores the old lines within the farmer's property, but follows the lay of the land; notably it follows the contours. There are nu-

merous variations, refinements, and supplements, such as terracing, grass on buffer strips and odd fragments of land, fallowing, grassing the natural drainage ways, and building ponds and check-dams to retain or restrain the water runoff.

Although Uncle Sam is ready with sound technical advice and, under some circumstances, cash payments to help the farmer, winning over the naturally conservative tiller of the soil to new methods is a slow job. Not long ago an eastern South Dakota conservation farmer related his experience: "When I started contour farming it got so I could hardly go to town, I got so much razzing over the change. Now the boys get me in a corner and ask confidentially what to do about their places."

Uncle Sam is rather like Tommy Atkins out in the Missouri basin: he ought to keep his place, which is the White House or Wall Street or somewhere like that, when things are going well in the valley, but he is a great old guy when you need him. And you need your rich uncle when it comes to paying for highways and dams and farm aid and a lot of other things that thinly settled states cannot buy for themselves. His boys are much in evidence as a result. Almost anywhere in the basin you can spot the familiar white tag on the license bracket: I for the irrigation people and other Interior Department bureaus, W for the Army Engineers, A for the various bureaus of the Agricultural Department, FS for Federal Security Agency. The men who drive and ride in these cars are a decent, self-respecting lot, usually given to excessive loyalty to their own particular agencies. The rank and file are likely to be assigned battered Fords and Chevvies, while a minor executive may turn up in a snappy station wagon, and the local big shots of the bu-

reaus go all the way to the Buick class. The shiniest Army car is sure to turn up with the proper starred red tag affixed to show the rank of whatever general is around. Furthermore, the Army has a C-47 to take its brass for the longer hops, while the Bureau of Reclamation uses a twin-motor Beechcraft.

When a senator or a congressman turns up at a basin meeting, it is fun to watch the bureau chieftains buttonhole him. They are always in need of appropriations.

The federal government actually has large responsibilities of long standing in the basin. It owns a vast amount of the land there. There are seventeen national forests, for example, covering 16,789,000 acres. They are to be found wherever forest growth is heavy from the Rockies to the Missouri Ozarks, but chiefly in the Rockies. Four fifths of Yellowstone Park's spectacular expanse, or almost 1,800,000 acres, is within the basin. Nearly three quarters of Rocky Mountain Park drains to the Missouri. So does the main entrance corner of Glacier Park. The National Park Service also has two other parks and sundry national monuments in the basin. Included among the latter are the Custer Battlefield in southern Montana. The Bureau of Indian Affairs owns about 21,700,000 acres in twenty-four reservations and institutions. Scattered about are almost 3,000,000 acres in national wildlife refuges.

More than 20,000,000 acres—31,250 square miles—of land in the basin remain in the public domain. This is land that never has been private, having belonged to the federal government since the Louisiana Purchase. Much of it is rough, wild, or barren, but some large tracts are fit for irrigation. Occasionally in recent times drawings have been

held for sale of small farms to war veterans who desire to homestead in the old-time way, but with such new frills as electricity and a ditch to carry water to the fields. Until recently a little bit of this land was left within one hundred miles of St. Louis. Sales of tracts in the public domain have been fairly frequent all over the basin. The largest areas left in the autumn of 1950 were more than 3,600,000 acres in the Big Horn Valley and a similar area in the North Platte Valley. Next was about 2,000,000 acres near Fort Peck Dam.

Much of the federally owned land is in the Rocky Mountains proper and the various offshoots of the principal chain. Outstanding among these semi-detached ranges are the Big Horn Mountains in north-central Wyoming. Their peaks run up to well over ten thousand feet, and the few roads that cross them are among the most daring and trying mountain drives in the country. When viewed from a plane, some of these thoroughfares seem hardly less narrow and steep than the horse trail that ascends lofty Long's Peak, a Colorado sentinel of the basin. Long's is one of several Colorado mountains at the pinnacle of the Missouri Valley, being over 14,200 feet high. Another is Mount Evans, considered hardly more than a suburban park by Denver people, for the motor road that climbs it is easier, more spectacular, and slightly higher than the road up Pike's Peak, near by in the Arkansas basin. The highest basin point in Wyoming is Gannett Peak, 13,785 feet, on the Continental Divide in the Wind River Range. Highest in Montana is Granite Peak, 12,850 feet, just west of the Red Lodge or Silver Gate highway, the newest and surely most scenic entrance to Yellowstone Park. The lowest point

in the basin, naturally, is the mouth of the Missouri River, 395 feet above sea level.

While the basin contains many obvious contrasts, the greater part of it is homogeneous and has a community of interest. Missouri stands out as essentially different from the other states if Iowa and Minnesota are overlooked because of their small areas in the basin. Missouri is more populous than its western neighbors. It is more industrialized, and has more varied farming. Leafy trees cloak much of its countryside. Its eyes are inclined somewhat toward the East and Chicago, for it feels more a part of the broad Middle West than of the Great Plains. Its tie with the rest of the valley is somewhat an accident of the geography that caused the basin to use it for a drain. Indeed, the problem of Missouri in the basin, like that of the strip immediately west of it, is to fend off unwelcome flood water that would be liquid gold if it could be sprinkled over the plains states.

Wind and water, water and wind! They can make or break this basin country. Without the wind, the whole weather cycle would be upset. In many plains and prairie sections the wind seems never to stop for months on end. It can blast with the stinging snow of winter or seer in the summer sun. It can make a nervous wreck out of you, if you let it, but a lot of the people who grow up accustomed to it probably would vaguely sense something missing were they transported to a quiet climate. The wind abetted drought in creating the Dust Bowl of the thirties, which took in a large western slice of the Missouri basin. It drifted the fine, blown earth until fences, then outhouses, then dwelling doors were buried in dirt. It carried the vagrant dust all the

way to St. Louis, where housewives battled against it. There were dust storms in Kansas in the spring of 1950, and the day after Easter Kansas City was so enshrouded by the residue that the skyline was blotted out half a mile away. Back in the drought of 1936 the dust was kicked up in swirls on country roads on both sides of the river in central Missouri, while cornstalks withered from green to brown and died.

It can happen again. The basin has enjoyed a long wet spell in the weather cycle through the forties and as the fifties started. Wiseacres shake their heads and declare that a new dry spell is already overdue.

The old-fashioned windmill still pumps water for livestock and even for humans in many sections of the basin. A new twist has been added for some—a small electric generator attached to the blade shaft to grind out current for the farmers.

Weather is not all. Take grasshoppers, for instance. They got so bad that the 1950 Wyoming Legislature enacted a law to control those pesky "leaping orthopterous insects." It set up a five-man control board, put up $750,000 cash, and did not even ask landowners to chip in. Uncle Sam did some chipping, however. The five-man board did not have to leap after the 'hoppers. Airplanes did that, cruising at low level back and forth over extensive areas of the big state. Young men wearing the inevitable cowboy boots transferred poisoned bran from motor trucks to planes. Persons attending a river meeting at Casper in June saw a war-surplus B-18 bomber being thus loaded. The bomb bays carried the bran, which was worked out through ducts to bait the pests. All this effort was important because a

visitation of grasshoppers is capable of cleaning out a field of growing crops.

One index to the nature of the region may be found in a national telephone census made by the Bell system as of January 1, 1950. The ten states in the Missouri basin (including the important areas of some of those states beyond the basin boundaries) had 11.3 per cent of the telephones in the country. While these states had then 10.7 per cent of the country's population, their area is 28.6 per cent of the nation. What was more significant was that these states had virtually one third of all the old-fashioned handcrank phones and only one twelfth of the modern dial instruments. Outside of the big cities the basin states obviously had none of the mobile phones, the radio instruments installed in automobiles.

Although 85 per cent of all farms in the nation were receiving electric service by midsummer 1950, the Missouri basin lagged behind, with only 75 per cent. A Rural Electrification Administration official explained it this way in a report to the basin: "This is mainly because of acute power supply problems in many of your areas. Another reason is the distance between your farms. In North Dakota, for instance, only about 56 per cent of the farms have electricity; in South Dakota, 60 per cent, and in Nebraska 73 per cent. In fact, the larger portion of the nation's farms remaining to be electrified are located right here in the Missouri basin states."

This does not mean that there has been no progress: in 1935, before the rural electrification movement was active, only 8 per cent of the basin's farms had current. The valley's farms are reported to be consuming two billion kilo-

watt hours per year at present, but the Agriculture Department predicts that this figure will rise to five billion KWH by 1960 and eight billion by 1970.

Traveling over this relatively unsettled country can be pleasant, but is usually difficult to arrange unless you happen to be moving between points on the few main routes. Elsewhere the easiest way is to go by private plane or automobile. A surprising number of ranchers, cattlemen, and others fly their own light planes. Cadillacs, Lincolns, Packards, and Buicks are fairly common. An automobile can make fast time everywhere but in the mountains, for the roads are good where they are made, and sight-distances are excellent. From Missouri to the mountains it is easy to hold the speedometer at 75 miles per hour or higher much of the time and actually to traverse 60 or 65 miles every hour. This can be done safely and in some cases legally.

Most main highways in the northern two thirds of the Missouri basin are "blacktop" (bituminous macadam) rather than concrete. This type is cheaper to build than concrete and easier to repair, and it notably withstands better the rigors of extreme heat and cold. There are just a dozen main roads over the basin from east to west, cutting across a territory about 600 miles deep, from U.S. 2, below the Canadian border, to U.S. 40, in central Kansas. Possibly the most important of all these, from the basin's standpoint, is the Lincoln Highway, U.S. 30, which stands out on every map because of the long dip it takes as it follows the Platte River across southern Nebraska. Main north-south highways—that is, roads that are paved and run pretty well through the territory—are even less numerous. There are only half a dozen of them in a span of more than 800 miles

—and three of these (U.S. 75, 77, and 81) are concentrated near the eastern edge of the main portion of the basin. About the only other ones are U.S. 85, Denver to Williston, North Dakota; U.S. 87, Denver to Great Falls, Montana; and U.S. 89, along the western part of the basin in Montana and Yellowstone Park. Routes that angle across the basin are almost totally lacking. It is common almost everywhere to find gaps of from 75 to 100 miles between main highways—sometimes with nothing but faint trails within them.

The pattern of the railroad service in this broad valley is about the same as that of the highways. Half a dozen east-west trunk lines dominate the area. These are the Great Northern, the Northern Pacific, the Milwaukee, the Burlington, the Union Pacific, and the Missouri Pacific. East of Omaha and Kansas City the Wabash also is important. The Santa Fe, with its crack trains for Los Angeles, streaks across the lower neck of the basin within a few hours. A few other roads—such as the Chicago and North Western, the Rock Island, the Soo, the Katy, and the Gulf, Mobile & Ohio—serve certain districts.

It is the Pacific coast cities, plus Denver, that have brought streamlined trains to the Missouri basin routes. Great Northern and Burlington has the *Empire Builder;* Northern Pacific and Burlington the *North Coast Limited;* the Milwaukee the *Olympian Hiawatha;* Union Pacific and North Western the *City of Los Angeles, City of Portland, City of San Francisco,* and *City of Denver;* Union Pacific and Wabash the *City of St. Louis;* the Rock Island the *Rocky Mountain Rocket;* the Burlington the *California Zephyr* and *Denver Zephyr;* the North Western the *Dakota*

400; the Wabash the *City of Kansas City;* and the Missouri Pacific the *Missouri River Eagle* and *Colorado Eagle.* You can see more of the Missouri River from the *Eagle* named for it than from any other train, but the Great Northern runs beside some interesting northern stretches of the stream, while both the Milwaukee and the Northern Pacific follow the banks close to the river's source at Three Forks. Sounds like a lot of fancy trains, but it is a long way between stops on most of them, and perhaps hard going to your destination if it is off the main line. Some of the roads are not too keen about booking Pullman rooms for intermediate points in the Missouri basin, for they usually enjoy a brisk demand for through accommodations to the "Coast." Most of them still serve right good meals; the northern lines especially have managed to preserve some semblance of the old-time art of dining, even if they do ask about $3.50 for a steak served at one hundred miles per hour. You can buy drinks on the trains except in Kansas and Iowa. At least one weary traveler, however, once failed to get a bracer on the Northern Pacific in Montana because of some mumbo jumbo about Indian reservations.

Away from the principal trains the traveler's life can be rugged. Burlington gives the service from Denver to Billings, Montana. It is a trip of about 22 hours to cover only 670 miles, only partly mountainous. You can drive the same route between sunrise and sunset or fly it in a few hours. To reach much of the basin from its eastern end the best bet generally is to go by way of Chicago or the Twin Cities.

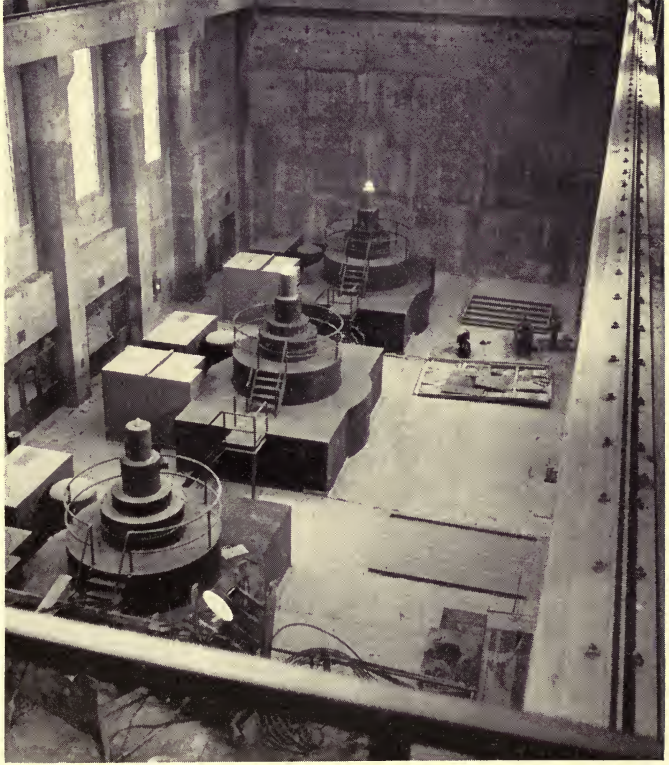
Aerial travel offers the best opportunity to grasp the scope and feel of the Missouri basin. But scheduled air-line routes across the basin, like the other modes of travel, are

limited, with broad gaps. There are TWA and Midcontinent between St. Louis and Kansas City, and Continental on to Denver. United Air Lines' main route crosses from Omaha to Cheyenne, Wyoming, and beyond. Northwest Airlines traverses southern North Dakota and Montana. Western Air Lines zigzags from Denver to Minneapolis and St. Paul and cuts northwest from Denver across Wyoming, Montana, and Alberta. Midcontinent has a line from Kansas City to Minot, in northern North Dakota. One other line, Frontier, flies from Denver to Billings by way of a series of dog-legs across Wyoming.

A few years ago, when the old Challenger line was operating this part of the present Frontier system, it was as chummy as a suburban train. They used some old DC-3's with four rows of narrow seats instead of the usual three, but often had to keep some of the extra seats vacant to make up for pay load in the mail and express compartment. One day they got to the practical limit for number of passengers and ran into a snag. The ship sat on the ground for an hour at a little Wyoming city while teletype instructions from civil aeronautics officials were awaited. Finally the message came through, and instructions were obeyed. An attendant shifted one sandbag from nose to tail and they were off!

The return trip was delayed. The flight came from Billings, where the airport squats on a high bench. There was fog, and planes have been said to roll off that bench when leaving or smash into it when trying to land in bad weather. So Challenger waited for the fog to lift. Then it began picking up passengers who had a close connection to make at Denver. None of your fuddy-duddy rules here; this

3. *Pathfinder Dam on the North Platte River, Wyoming, built 1905–9.* R. D. Dirmeyer, from Bureau of Reclamation.



4. (a) *Kortes Dam on the North Platte River, Wyoming.* B. A. Miller, from Bureau of Reclamation.

(b) *Tops of three hydro-electric generators at Kortes Dam, Wyoming. This is the only Interagency dam built*

pilot was an accommodating fellow even if he did have a lot of stops to make. He swooped down at a sharp angle, hesitated on the graveled runways long enough to pick up a mailbag in the back door as a passenger or two scurried on or off as the motors idled, and then zoomed the DC-3 into the air in a steep, sharply banked climb. The connections were made and a good time was had by all, including a middle-aged drunk who was taking his elderly mother on her first plane ride.

That Billings airport is not the only tricky one in the basin. Helena, Montana, for example, has its field in a narrow mountain cup, and pilots must keep a sharp lookout, especially in foul weather. At Kansas City the municipal airport nestles behind Missouri River levees, and passengers sometimes wonder if they are going to drop into the stream. Pilots approaching that field from the south curse a new television tower of the *Kansas City Star*, which threatens their way. Not long ago the site of some new apartment houses on a Kansas City bluff was shifted a little to clear the glide path to the field. Lake Andes, South Dakota, near Fort Randall Dam, has one of many rudimentary grass fields. A press plane landing there once stirred up a jack rabbit that leaped almost as high as the wing as it raced through the tall grass. A group of basin specialists took off in South Dakota one winter evening in fine weather, but just ahead of a storm. When they finally located the Omaha airport through a pall of sleet, their plane slid and skidded the entire length of the icy field before it came to a halt.

At most of the dams under construction a streak or two in the prairie grass denotes the spot on which the contractor

has chosen to land his plane. Quite a number of the basin towns have paved airports that were military fields in World War II. Grass has grown through cracks of the runways, and the hangars and wooden barracks are largely shut down, but commercial and private flying operations go on just the same. No need for a tower or fancy controls and services. An old windsock and a single stationary gasoline pump with a long hose on a reel will do well enough. If your pilot makes a mistake and lands downwind on such a field, it does not much matter—just a bit of bumping.

Rapid City, South Dakota, gateway of the Black Hills, has an active military field where in the late 1940's a hangar was erected capable of holding two of the giant B-36 craft, or three if one is parked with its nose sticking out. The hangar is a beautiful monolithic concrete arch, tall as a small skyscraper and big enough to cover a couple of city blocks. At the time it was finished the only other one like it was in Maine. To match the hangar, the runways are of great thickness, to hold the weight of the big bombers.

The airport at Great Falls, in northwestern Montana, was a busy place and a strange one in wartime. It was there about 1942–5 that many American fighting planes were delivered to Russian pilots, who took them to Soviet territory. From this field, which is on a broad plateau, where the air at all seasons seems thin and penetrating, the route to Siberia was via Edmonton (Alberta) and Alaska. Men of the Northwest became only too well aware, in the tense days that followed the outbreak of the Korean war, that this could be a two-way route.

Ironically, at the other end of the Missouri basin America

is taking a big step to arm against Russian aggression. At the St. Louis municipal airport—which, incidentally, is actually within the basin—a busy factory for some time has been turning out jet planes for the Air Force. Men and women at that end of the basin no longer even look up, day or night, as they hear the quick *whoo-o-o-sh* of a jet plane being tested. No use anyway; jets cannot be spotted except for a few seconds after they take off, though they may leave a trail of vapor behind.

Talk of aviation often leads to talk of weather. The Missouri basin has plenty of weather. It is a jim-dandy place for weather. It is not uncommon to find the thermometer up around 110 degrees in summer, not only in Kansas and Missouri but, at midday, far north on the Great Plains. In winter, below-zero temperatures are customary in the greater part of the basin and may occur anywhere there. In Montana and North Dakota the mercury often drops to 30 or 40 below zero, and sometimes even lower. One reference work says that the lowest temperature ever recorded in the United States was 66 below zero at Yellowstone Park in 1933.

Vagaries, contradictions, and the bizarre can, and often do, constitute the weather fare in most of the basin. In Nebraska the common saying is: "If you don't like the weather, just stick around awhile—it'll change." It seems as if the change usually is for the worse. People at a basin meeting in Lincoln early in December a few years ago groused about the wind-driven zero weather. Next day they were awakened by the hotel operator, whose cheery greeting was: "Good morning! The temperature is 22 below."

With that, a pair of big-city newspaper men dressed hastily and sought a taxi. Naturally, there was none. Well, a friend could wangle a state-highway patrol car—but the last one in town was frozen stiff. A mail messenger took pity and loaded the visitors into his jalopy. The windshield and windows were so thick with frost that he could barely distinguish red from green traffic lights. He got the travelers to the railroad station on time—even if it was the wrong station.

Extremes of weather are the rule, too. An official party toured to the Dakotas a few years ago about the first of October, prepared with tweeds and topcoats. Its members sweltered through an elk-steak dinner the first night, with the temperature in the 90's; the next night, only 200 miles north, they struggled to a pheasant meal through bitter sleet and high wind. Along the Canadian border mid-October can be shirtsleeve weather or it can bring winter's first snow and ice.

Operation Snowbound dealt with the worst blizzards the basin has known in many a long year. Snowstorms in this region usually are not severe—at least, they do not generally block any large area. Early winter of 1948–9 brought a humdinger, however. This series of storms, culminating in January 1949, sealed 138,000 square miles, chiefly in western Nebraska, South Dakota, and Wyoming, an area exceeding that of New England, New York, Pennsylvania, and Delaware. High, steady winds blocked all the highways and railroads and, aided by weight of snow and ice, wrecked many telephone and telegraph lines. Cities and towns were isolated, and countless lonely ranch families were imprisoned in their homes with inadequate fuel and food, some

as long as between sixty and ninety days. Livestock died because it could not paw down to food or water.

General Lewis A. Pick, then stationed at Omaha as the Missouri River engineer, was placed in charge of *Operation Snowbound.* The Army rushed men and equipment in volume. Within nine days more than 17,000 miles of roads were opened to travel, while airplanes dropped feed for cattle, and supplies for ranchers. This was an instance of protracted snowfall in an early winter.

Somewhat more than a year later, when spring was due in 1950, winter had a last fling. This was a worse snow than before in North Dakota and north-central South Dakota, covering a quarter of South Dakota. Some persons wanted the Army called out again, but the governors of the two states refused, because they felt that the situation could be handled locally. In South Dakota the state cleared the main roads and rented equipment to the counties to clear theirs. The state told the ranchers to rent bulldozers for their own roads. When the ranchers complained that this would cost fourteen dollars an hour, state officials asked: "Isn't it worth the price of a couple of cows to save a hundred and fifty?"

During the night of September 29, 1950, snow fell on Mammoth Geyser, Yellowstone Park, to a depth of sixteen inches. About that time the thermometer fell to 10 degrees in Montana while it rose to 88 degrees in New York City. Even in June it is not uncommon to find public buildings in Montana using steam heat. On the night of August 20, 1950 a record audience of more than 11,000 persons sat in the open-air theater at St. Louis for a Rodgers and Hart music festival and returned home to find that the temperature was 49.

Some tales of winter travel adventure have been told by the barber steward on the Great Northern's *Oriental Limited.* He said:

"About 1947 the *Oriental* picked up a poor Diesel locomotive at Havre, Montana. By the time we got to Glasgow, Montana, with the temperature at 40 below zero, all the steam and water pipes froze. Finally they got steam up again and limped into St. Paul, but the pipes kept bursting and there were puddles on every car floor. We really had trouble the year before when the *Oriental* was stalled for thirty-six hours by a blizzard, between Williston and Stanley, North Dakota. The wind drove the fine, powdery snow so hard that it was impossible for the engine crew to see the block signals—yet the ground wasn't even white."

The wind makes a lot of difference. Residents say the intense cold is not hard to bear when the wind is still. One still morning, with the mercury about 40 below zero, Governor Fred G. Aandahl of North Dakota drove his car from home to the Capitol in Bismarck without even thinking to don gloves.

Unfortunately, the wind blows over the plains a great deal of the time, winter and summer. When the temperature climbs to 100 and higher, the wind can drive blistering heat straight through a speeding automobile. But when the blasts of winter howl across the big reservoir back of Fort Peck Dam, in northeastern Montana, ice forms two and one half feet thick. The Army Engineers cut protective slots around their workboats anchored in a coulee, which is a harbor in a fold of the plains.

In almost any season certain conditions cause fog. Along the lower Missouri at night or in the morning, deep, thick

fog may blot out the entire flood plain and stream between the bluffs for a width of several miles, while the hilltops are painted with moonlight or sunshine.

Hail is a scourge of the basin. A settler from Iowa managed to pull through four successive seasons of crop failure on his Montana ranch. The fifth year he had a bumper stand of wheat. Suddenly, a week before harvest time, clouds came down from the mountains and hail stripped the wheat fields bare as he watched helplessly from his doorway. Not long ago hail fell so hard at Alliance, Nebraska, that a motorist pulled up beside a boxcar on a railroad siding for shelter. He barely escaped injury when a gust of wind tore the roof from the boxcar and dropped it on his automobile. In August 1950 hail as big as chicken eggs covered the ground to a depth of two feet near Vermillion, South Dakota, and fields of flax and corn were laid waste. Four months later the whole vicinity of the mouth of the Missouri was whitened as from snow by hail as big as golf balls; at some places in St. Louis the pellets half-covered automobiles and destroyed greenhouses.

Floods can be the worst disaster of the basin. They occur everywhere, even in the arid sections. Most publicized are the great rolling torrents of relentless, muddy water that rush down the Missouri proper. Just as bad in their way, at least for their victims, are the inundations of the tributaries, the little rivers and the creeks. Cherry Creek, normally an insignificant trickle, has been known in the past to pick up a cloudburst and sweep destructively through the heart of Denver. You have to look twice in summer to find the Kansas River or the Platte, yet they can quickly rise to submerge rich lands and towns. The Heart River, in central

North Dakota, recently went berserk and cut in two the main line of the Northern Pacific Railway.

Such a variegated region as the Missouri basin naturally has an abundance and variety of wildlife. Jack rabbits and prairie dogs are all over the plains. The mountain fastnesses have bear, deer, elk, moose, porcupine, the cute little whistling marmot, and ten zillion chipmunks. The raccoon, possum, and other fur bearers flourish in some sections. Wolves range the river bottoms almost everywhere, and even today the county clerks within a few miles of St. Louis pay out with fair regularity the state's ten-dollar bounty for dead wolves. Not long ago a motorist ran over a wolf on U.S. Highway 40 only twenty miles west of St. Louis. A wildcat has been seen on a badminton court even nearer that city. These facts need not frighten tourists, for wild creatures do not leap on passing strangers in the Missouri basin.

In the parks of the Black Hills in South Dakota herds of bison and antelope range freely near the roads. The bison can be dangerous to a man trying to mingle with them, even if he is on horseback. The beautiful little antelope, on the other hand, is quite timid. There is a farm wife on a main road near Rapid City, South Dakota, however, who keeps (or used to keep) a pair of tamed antelopes in her yard. Deer are to be found in many places where there is cover, including the thickly wooded central-eastern Missouri. A big buck strayed into St. Louis County recently and was run down by an automobile.

There has been a great to-do of late over a proposal attributed to the Department of the Interior to permit a wholesale slaughter of "surplus" elk in Yellowstone Park. The idea was to let hunters line the route through which

they would be driven. Sportsmen and liberals bitterly opposed this, charging it was merely a scheme to provide for more grazing for the herds of large livestock-owners. To date the slaughter has been averted.

For the angler, opportunities perforce are limited in a land of so little water. There are fine sporting trout of the brook and rainbow varieties in the western mountain streams. Cold, spring-fed Ozark rivers in Missouri harbor the game small-mouth bass and imported rainbow trout. In the Missouri River, especially in its eastern reaches, there are husky channel catfish and a variety of rough fish that commercial fishermen take.

The big reservoirs being created in the basin-development program are widely acclaimed as fishermen's paradises. Without doubt they offer fine fishing in their early years, but the preponderant opinion in informed circles seems to be that the quality is bound to deteriorate in time. Some experience tends to prove this, though instances of fairly prolonged good fishing are cited in disproof. You can still take perch and some other game fish, for example, at Fort Peck Reservoir, which has existed since 1937. Other denizens of the reservoirs, at least in early years, are bass—some say that the less sportive large-mouth kind tends to replace the small-mouth—and a mixture of lesser types.

To many persons the outstanding game of the Missouri basin has been the beautiful, smart, and tasty Chinese ring-necked pheasant. South Dakota was its chief habitat for a long time, North Dakota perhaps next. Literally thousands and thousands of these birds were to be seen everywhere you turned in the Dakotas in the autumn of 1945. The following year not a single pheasant was observed in a drive of

hundreds of miles across these states at the same season. Visiting hunters used to play a big part in the economy of South Dakota, but now the open season has been sharply curtailed and the bag limit of nonresidents cut. Some basin people have a theory, for whatever it may be worth, that there has been a slow migration of the pheasant population from the Pacific Northwest through the Great Plains, and that it is now heading for Wisconsin.

The Missouri and the Mississippi rivers together constitute the nation's greatest flyway for wildfowl. As soon as cold weather hits Canada, the impressive flights of ducks and geese start across the Missouri basin. In September and October they can be seen along the Missouri up north and in the ponds and potholes that dot much of North Dakota. Gradually they move to the marshes, dead channels, and old oxbow loops along the river in the lower basin. You do not have to be a hunter to be impressed by their beautiful flying and their noisy quacking and honking.

In the Rockies there is the ptarmigan, a form of grouse whose feathers blend seasonally with the stones or the snow. In September 1950 a live stormy petrel, an oceanic bird, was found in eastern Missouri, apparently blown there by the tail end of a tropical hurricane. Sea gulls and pelicans are numerous at Fort Peck Reservoir.

In spite of its contradictions, its loneliness, and its hard life, the Missouri basin is well loved by a great many of its people. Something about its vastness, its ever present enigmas of nature, grips them. It has a beauty all its own. Go, for example, on a twenty-mile drive at chilly daybreak in late summer from the railroad station to Fort Peck. At the outset the Milk River valley is buried in white fog. Then,

on the Montana benches, 2,200 feet higher than the distant sea, the land alternates in strips of wheat and fallow ground, the one shiny platinum, the other a rich black. The tremendous bowl of dim sky has streaks of clouds and long fingers of red from the coming sunrise. Tinsel-bright stars fade slowly. Buffalo grass and other lush growths line the roadside. The coulees are dotted gray and green with sagebrush. Once or twice a wary pheasant darts ahead of the car. Copper and aluminum cables of a heavy power-transmission circuit shine against the horizon. Ahead the lights of Fort Peck shimmer in the haze. Then, behind the long, bending gray line of the huge earthen dam, the reservoir looms into view, cold, blue, and brooding.

It is great country, this Missouri basin!

CHAPTER IV

Take Stanley County: It's No Rhode Island

One sixth of a nation, which is the Missouri basin area described heretofore, calls perforce for a great deal of generalization. Let us take a closer look at a single county, one that fairly typifies vast reaches of the plains country and might be considered fairly symbolic of the whole valley. Here may be found a more intimate idea of the hardships and the lonely life.

Take Stanley County, at the center of South Dakota and almost at the center of the whole basin. With a direct flight you could fly there in four hours from Chicago or St. Louis, but what a different world it is from those crowded, bright cities!

The Missouri River forms the meandering eastern boundary of the county, where preliminary work has been started on one of the big barriers, Oahe (*Oh-AW-hee*) Dam. The Cheyenne River, coming down out of the Black Hills, is the northern boundary. The Bad River, which rises near the famous Badlands, has cut a rather fearsome-looking earthen gorge across the southern part of Stanley County. The county's sole railroad, a branch of the Chicago and North Western, winds and climbs through this declivity. From aloft, the land has a distinctly mountainous look where the generally high ground of the county breaks away toward the rivers. The highest elevation is almost

1,800 feet above sea level. One highway, U.S. 14, gravel-surfaced, crosses the county.

Stanley County covers virtually 1,500 square miles, being about one fourth again as large as all of Rhode Island, even allowing for that state's water area. You do not have to allow much for water in Stanley County. The atlas shows five scattered towns, the largest being Fort Pierre, a reminder of Indian-fighting days. That dusty town, with stores and other trading centers, a saloon or two, and a few hundred inhabitants, is the county seat. It is across the Missouri River from South Dakota's little capital city, Pierre—universally called *Peer* in the Dakotas, though it bears the given name of a French fur trader from St. Louis.

Back in 1920 Stanley County had a population of 2,908. This dwindled, almost steadily, down to 1,959 in 1940. The 1950 census saw the county pick up a bit—84 additional persons, for a new total of 2,043. Chances are that the work on Oahe Dam was at least partly responsible for this rise. Strangely enough, this county's gain, percentage-wise, was four times as great in the last decade as that of all of South Dakota. Stanley administers the neighboring county to the north, Armstrong, which has 12 taxpayers, 40 other residents (mostly Cheyenne Indians), and no local government, not even a post office.

There are 468 acres per person in Stanley County, or about one and one third persons per square mile. The beef cattle appreciably outnumber the people. Put it another way: suppose some power were to descend on New York's teeming Central Park and drive out all the people except two—the park would be more heavily populated by that remaining couple than Stanley County is today.

At a meeting of the Missouri Basin Interagency Committee, Stanley County was the theme of a thoughtful paper prepared by Alfred L. Johnson, representative of the Production and Marketing Administration of the federal Department of Agriculture, stationed at Huron, South Dakota. While naturally the author of the paper presented his Department and his particular bureau of that Department, PMA, in a good light, what he had to say lacked political or philosophic bias. PMA, as most people know, has been engaged in supporting farm prices, setting acreage allotments for farmers, handling marketing quotas, aiding in food distribution, and promoting agricultural conservation practices. Much of its work, needless to say, is controversial. The conservation program it has followed since 1933 comes into conflict at some times and places with a roughly similar program of the Soil Conservation Service, another bureau of the federal Department. But Stanley County obviously likes PMA, and ruggedly Republican South Dakota welcomes this New Dealish federal aid. What Mr. Johnson had to say was stated from the point of view of an earnest public agency fulfilling its duty; much of his paper is quoted here with his permission.

Stanley is one of the state's driest counties, Mr. Johnson said, despite the fact that more than 125 miles of its borders are rivers. Annual precipitation is only sixteen inches, much of which comes as snow, not as rain at crop time. He continued:

"There isn't much rainfall in Stanley County, and through the centuries most of the rain has run off into the Cheyenne, the Bad and other tributaries of the Missouri, and into the Big Muddy itself. The soil is black but only

moderately fertile. The shale material from which the soil is derived was deposited as a salty clay in an inland sea millions of years ago. The glaciers that smoothed out the country east of the river missed most of Stanley County. The land surface in the county was formed by erosion and it still erodes easily unless properly managed. When the water runs off the unprotected land and fills the creeks and the streams and the rivers and finally gets to the Missouri, it takes with it a lot of the soil of this county. That's one of the reasons why the Missouri is called the Big Muddy.

"Properly managed, the soil produces a good stand of nourishing grass—western wheatgrass, buffalo grass, and other native grasses for livestock. There is, normally, moisture enough in the soil to produce grass for the livestock, but the limiting factor has been water—water for livestock to drink and water for people to drink. What about wells? It is a common saying in Stanley County that it is five miles to water—five miles across and five miles down. The clay shale beneath the thin topsoil, extending to a depth of probably 1,500 feet on the average, is not porous enough to hold [that is, draw from the surface] any usable quantity of underground water such as is found in some of the glaciated areas east of the river. So Stanley County people and livestock have to depend on surface water, the water they can save out of the rain and the snow. It's the job that has been done in catching the surface water and making use of it that makes the greatest accomplishment in the conservation activity of PMA in Stanley County."

Mr. Johnson went back to 1935 to tell a little about the county before this range program got under way. Outside of Fort Pierre the people then were scattered over 350 ranches.

Most of the county's nearly 960,000 acres was in range, where livestock grazed precariously. Then and now perhaps only 50,000 acres were planted to crops, but there was no irrigation. Plow most of that land, and the grass cover disappears, followed speedily by the topsoil. He went on:

"You remember the beating that South Dakota as a whole took in the thirties from low prices and the droughts of '34 and '36. Stanley was one of the counties that was hardest hit, with some changes that have lasted, but by now not all of them seem bad. There were a great many families that lost their homes, their livestock, and their land; some in '34 and more in '36. You remember how the federal government bought up cattle in this state and shipped them to states that had enough feed and water, simply to keep the animals from dying of hunger and thirst.

"There were about 34,000 animal 'units' in the county in 1934, which was a high point in livestock numbers for that period. (A unit is one cow, one horse or five sheep.) By 1937 hard times had forced the livestock total down almost one half, to 18,000 units. Ranchers weren't even able to keep up their foundation herds. The animals they could keep were so thin you could hang your hat on almost any part of any cow in Stanley County. The owners of a good many of those cattle packed up and went to other regions where there was a better chance to keep alive. They haven't come back. There are about 100 fewer ranches in the county today—250 compared with 350, and their size has gone up more than fifty per cent to about 3,900 acres in the average holding.

"When a family got burned out by a drought back in

the thirties, there was usually a sale of a certain amount of land to one of the neighbors who was able to stay. But for the most part the land became simply tax-delinquent land. And there were times when the county officials didn't have enough money in the treasury even to do the necessary advertising to take title to the land.

"What about those farmers who were able to stick it out? What was it they had that the other fellows didn't have? Greater strength of character, greater fortitude? Not necessarily. In most cases it was a supply of water, usually in the form of a tiny pond backed up by a little dam thrown across a gully by a homesteader twenty-five or thirty years earlier. When we counted those dams in 1937 we found only about 150 of them in the entire county—just about one dam and stock pond for each rancher that was able to stick it out during the blistering thirties.

"I guess it took two severe droughts in this part of the country to convince the federal government that there were things that needed to be done and could be done in the range country. At any rate, it was in 1937 that the federal range program got started and the committee of farmer administrators in Stanley County began to explain to the other ranchers what assistance the government would offer. The big emphasis was on building water facilities on the range. For the most part, that meant constructing an earth dam across a gully to catch the runoff. It wasn't quite that simple, because the government was offering to repay the rancher for a considerable part of his out-of-pocket expense in constructing a dam. We were insisting that each dam be a good one, that would last for years without washing out,

and that would hold enough water. From the very beginning we drew on the research of agencies experienced in facilities for storing water on the land.

"We knew that the rate of evaporation in western South Dakota was so high in summer that we'd have to allow five or six feet of water in a pond for evaporation alone. We learned that a dam needs a certain slope on the front and a different slope on the back. We learned about spillways and trickle tubes. Those things all went into the plans and into the dams that the ranchers began to build with financial and technical help from our organization.

"It takes a contractor who has sizable earth-moving equipment to build a good earth dam. The typical dam, at least in Stanley County, is built of 4,000 or 5,000 cubic yards of earth. The contractors who do most of the earth-moving charge 12 to 15 cents a cubic yard. The rancher can recover part of the cost of building the dam, if it is properly located; if it meets prescribed specifications; if it has been determined by the farmer committeemen of PMA that the dam is needed, and after requirements under state law have been complied with by the rancher. The most any farmer can receive for installing all conservation measures in any year is now $750; in 1948 the maximum was $500."

Mr. Johnson provided a graphic demonstration with his paper of the great increase in water-storage facilities in Stanley County within thirteen years. There, as in many other sections of the Missouri basin, the arid plains have been dotted with big and little ponds. He continued:

"The county now has almost 1,300 ponds, some of them small lakes. There used to be less than one pond to two ranches; now there is an average of five to each ranch. It

used to be one water facility to 6,000 acres; today there's a pond to every 800 acres on the average. I think it's safe to say that there isn't a ranch in Stanley County that doesn't have some kind of water facility. Most of them, of course, have more than one.

"The number of people is smaller today, but they're making better use of the land, and they've bought more than 120,000 acres from the county, which had had to possess it for tax delinquency. The taxes are pretty well paid up today, thank you. The livestock has come back, on what looks like a permanent, sound basis. The number is higher now than it has ever been and there's still no sign of overgrazing. Stanley County always has produced excellent grass and plenty of it. Almost every rancher has had acres and acres of grass that wasn't well grazed because he didn't have water enough to support the animals that the grass could feed. Today, the supply of water and the supply of grazing seem to be getting somewhere near in balance.

"The chairman of the county PMA committee was asked a few days ago what he thought would happen if we were to enter another dry cycle such as we had in the thirties. Would it be necessary to ship out cattle to keep them from dying? Would ranchers lose their shirts, their homes, their livestock again? His answer was: 'No. Of course, a drought wouldn't be good. But there's hardly a rancher in the county who doesn't have two years' supply of water on his place right now, enough water to take at least his foundation herd through two drought years in a row. We're fixed for it now because we have water.' So the water-facilities program has put a firm foundation under the livestock industry."

Incidentally, the many new ponds have proved to be excellent places for fishing; they have attracted ducks to a county that never knew them before; and they are credited with increasing the local pheasant and grouse population. Mr. Johnson remarked: "When Stanley County ranchers get together these days, you may not hear them talk about Hereford blood lines or the relative merits of crested wheat and gramma grass. More likely they'll be boasting about the size of the bass in their lakes."

The PMA representative also made it clear that he had chosen to talk about one specialized type of soil conservation and one particularly aggravated problem, which is being solved. He did not pretend that all the answers had been achieved, either in this county or in the multitudinous and vastly more complicated and varied troubles of the entire Missouri basin. What he did succeed in doing was to turn basin officials for the moment from the vast scope and Gargantuan data of the broad basin concept to a closer focus, in which some of the people, and the lives they lead, came into view.

Then, in conclusion, he, too, turned to the broader view, as he pointed out the significant relationship of the minor, local improvement in Stanley County to the thread of the grand design for the basin. He said:

"A grass and livestock economy is important; in fact, I'd say it is essential if we are going to make the best possible use of the soil and the water. That is true, not only in Stanley County, but over all of the state. One end of Oahe Dam (a huge, multi-million-dollar earthen project) will be in Stanley County, and this county's soil is subject to erosion. Unless we keep the soil in place with a tight cover of

grass at all times, we'll have Oahe and the other mammoth and costly dams reduced in effectiveness long before their appointed time, by accumulation of eroded silt in the reservoirs. The clay shale of Stanley County was originally deposited by water, and water could wash it away. I am confident that it won't do that, however, to a serious degree, because grass and livestock go together if there is water—and there will be water in Stanley County because the people are working effectively to get it."

CHAPTER V

People: between the Vikings and the Elizabethans

On the surface, people of the Missouri basin live much like the rest of America in many aspects. They are reasonably informed on national and world affairs. They follow the World Series ball games eagerly. Their chain stores carry the same nationally known brands as in Massachusetts, Arizona, or Florida. Betty Grable appeals to them, but so, too, do the most lurid cowboy movies. A new note on the prairies and plains is found in the drive-in theater screens that loom oddly on the horizons. Even the little towns are garlanded with neon signs, like imitation clusters of rubies. Except in the larger cities, high-school social and athletic affairs take on a surprising importance. The basin has the same quaint belief in the necessity and civic distinction of stop-and-go signals that the rest of America indulges. It has its churches, but a great many of them have the air of a hard struggle to survive. There are the usual rural and town civic and "service" groups. The yellow school bus of the modern consolidated district is a familiar sight. In the towns and cities life is not greatly different from that in the rest of the nation's urban communities, except as influenced by regional interests, products, and climates.

It is in the ways of the field that some of the more subtle differences of life between this basin and the rest

of the country may be traced. There is vast distinction between the daily problems of the sheep-raiser in Montana and, say, the chicken-farmer of the Delmarva Peninsula; between the outlook of the man who grazes white-faced beef cattle by the hundreds on the cold northern plains and that of the Kentucky horse-breeder; between the philosophy of a big-scale gambler on wheat in the dry lands and that of a Maine potato-farmer, or between the mental reactions of a hard-working irrigation farmer and those of a Georgia peach-grower.

Far less subtle are the distinctions caused by national background. The basin, to be sure, is part of the American melting-pot, but it has to a surprising extent a system of settlements by people of common family-tree origin. Predominant are the Scandinavians. People with roots in Sweden, Norway, and Denmark are strong in both Dakotas, Nebraska, and parts of Kansas and show up elsewhere. They are hardy, earnest, and largely successful people, good in agriculture, business, or politics. They take naturally to this colder climate.

One brisk June day in central Wyoming, when some visitors were donning jackets for a drive, sturdy old Einar Dahl, down from northern North Dakota, drawled: "I hope it isn't warm today; I don't like it warm."

It is a standing joke at civic meetings throughout a large slice of the basin for the politicians to call off, in a sort of Edgar Bergen dialect, the names of men who are or have been recently governors of these "Scandinavian-American" states. Without attempt to imitate the caressing pronunciations, the list runs something like this: Aandahl, Anderson, Brunsdale, Carlson, Mickelson, Peterson, Youngdahl. Even

the politicians with German names will run through this list with relish: it gets them on the band wagon.

If there is any strife among these three Scandinavian groups, it cannot be very far-reaching. Certainly they mix well in public matters. I have seen Swedes, Danes, and Norskes drinking and singing lustily together at a fishing camp. Only the initiate can tell the difference anyway; let's see, Jensen with an e is a Dane, but with an o it's a Swede —or is it the other way around?

In both North Dakota and South Dakota the Norwegians far outnumber the Swedes, to draw such conclusions as are possible from state-wide census data. In Nebraska the Swedes lead and the Norwegians do not show up in force, but the Danes do—Nebraska has a noticeable tinge of Danish culture. On the other hand, the Danes are relatively few in North Dakota.

Whole communities in North Dakota are Russian in flavor and national origin. They are Americanized only in some ways. Often they are marked by the onion-shaped spires of Greek orthodox churches, which otherwise may be the same dreary frame structures as those of the local evangelical sects. This Russian influx was attracted years ago, largely from the Ukraine, by the fact that these northern plains offered much the same sort of wheat-growing as these people had known in the land they wished to forsake. Western Nebraska also has Russian settlements.

In every state of the basin the German background shows up strong. It is part of the historic immigration that started about 1848. In Nebraska, for instance, there are communities in which the pattern of life retains the imprint of Teutonic orderliness and thrift.

Montana and perhaps sections of Wyoming and Colorado have proudly among their populations the descendants of English "remittance men"—the younger or ne'er-do-well sons of wealthy English families who were shipped off to the Golden West in the nineteenth century and supported by regular remittances or retainers from home.

Traces of Mexican origin are to be found here and there, in limited extent, in the Colorado portion of the basin and in Wyoming.

A fairly large number of Nebraskans count their heritage back to Czechoslovakia.

Four of the more northerly states of the basin—Montana, North Dakota, Wyoming, and South Dakota—have enjoyed marked influxes of people from Canada. They are non-French Canadians, and in all probability came mainly from the neighboring high, flat wheat provinces: Manitoba, Saskatchewan, and Alberta. The Canadian border extends for about 400 miles within the confines of the Missouri basin, from eastern Montana to the edge of Glacier National Park. In all this distance maps show only about a dozen roads across the border, none of outstanding importance and many of them quite minor. But for the lack of roads, this is one of the world's easiest borders to cross, and people do visit back and forth. Canadian economic restrictions, however, have cut down some of the trade that Montana and North Dakota used to enjoy.

The Iowa slice of the basin has more or less the characteristics of the people of that whole state, which so often is treated as the typical American farm state.

In populous Missouri you find a bit of everything. In the western part the farmers are an intermixture of Yankee and

German. Where Missouri's southern edge of the basin impinges on the Ozark Mountain country, the people still have some folkways that can be traced to the Elizabethans, straight through the Anglo-Saxon stocks that penetrated the low mountains of Virginia, Kentucky, and Missouri. The most easily distinguishable human strata in Missouri, however, are in two strips bordering the river near the eastern side of the state. A tier of river counties, mainly on the south side of the stream, is known as the Missouri Rhineland, while on the north side is a sector known as Little Dixie. The Rhineland is strongly, whole-heartedly Germanic, stanchly Republican, and traditionally Catholic. It raises grapes, for it likes wine. Little Dixie is a Democratic, Protestant, horse-raising, horse-loving country, with many Negro servants and farmers. It runs to bourbon and pretty women.

All this talk of national origins deals mainly with backgrounds one, two, or three generations, or even longer, removed. It is a safe conclusion that the Missouri basin actually has a remarkably low percentage of foreign-born residents. Breakdowns of census data unfortunately are not available for the basin proper. Perusal of state-wide figures, in the light of knowledge of the region in question, justifies the conclusion.

It is a white man's country. Where once none but the proud Indian roamed, there now are only about 70,000 Indians in the basin, the Department of the Interior estimates. They have fallen on a sad and humble way of life: not for these Indians a new Cadillac every time the old one runs out of gas. Nor are there many Negroes; it is doubt-

ful if the basin has as many as 150,000 Negroes, and they reside mostly in and near the few larger cities. North Dakota had only 201 Negroes in the 1940 census. Almost all of the big Negro population of metropolitan St. Louis lives outside the boundary of the basin, which, however, skirts one miserably abject suburban slum, Kinloch, home of more than 5,000 Negroes. Chinese and Japanese are numerically negligible in the basin states.

By and large, classlessness is marked in the basin. One man is as good as another, regardless of bank account or family lineage. In most of this country any man who can stand up against the elements is worthy of recognition, no matter what his walk of life. Besides, a man can be rich today and poor tomorrow—or the other way around: distant grain or cattle markets, the elements, or some other quirk of fate may cast the die. They tell the story of a man in North Dakota who was flat broke in the 1930's. He got one good wheat crop on his small place and began building up from that. The bankers counseled him to go slow, but instinct urged him to push on. He has increased his holdings to 20,000 acres and he owns 10 combines. In 1949 he was reported to have cleared $300,000 net before deducting income taxes.

The basin contains less than a dozen manufacturing centers of large importance. Because this is essentially an agricultural area, the main employment is in that field, plus the service trades in the towns and the jobbing centers that distribute clothing, shoes, groceries, beverages, tobacco, and other staples. To be sure, the basin has gold-miners and agronomists, airplane mechanics and biochemists, and so

on; but the man in the tractor seat and in the sturdy Western saddle (without fancy trimmings) dominates the regional economy.

It is a land of simple tastes, easy hospitality, and informality. Almost any town in the basin will make the stranger feel at home; towns like Loveland, Colorado, and Riverton, Wyoming, for example, go far out of their way to be hospitable. Loveland gives convention visitors free tickets, good in any public eating-place, for a generous slice of pie made of the neighborhood's famous cherries.

Cooking for public consumption in the Missouri basin rarely is of a quality to excite the gourmet, but frequently is good. Meals usually are of the substantial, "satisfying" variety, without fancy dishes or great culinary inspiration. If there is an outstanding regional dish, it is beef, which generally is excellent, served as steak or roast. Among the places where I have enjoyed fine meals are the Bellerive Hotel at Kansas City, the Jayhawk at Topeka, the Fontenelle at Omaha, the famous Brown Palace and an Italian restaurant at Denver, the Dude Corral at Loveland, a little South Dakota country club whose location I have forgotten; the Montana Club and a roadhouse at Helena, the Rainbow Hotel at Great Falls, the Northern at Billings, the Frontier and the Plains at Cheyenne, and a roadhouse near Bismarck. Alas! there are too many other establishments—mostly but by no means all in the smaller towns—where my eating has been done as a necessary habit rather than a pleasure.

Private entertainment can be different. There was, for instance, the night when visiting rivermen were guests of a wealthy oil operator at Cody, Wyoming. An old-time hunt-

ing guide cooked venison and other game in the patio, while the host's friends and neighbors tended bar in the game room. There was a meal! That was the night, incidentally, when some Republican governors amused themselves by tossing darts at a crayon sketch of John L. Lewis, and a Democratic Senator put for cover when a naïve photographer sought to catch him in the game.

This is a bourbon country. The Easterner who asks for Scotch will not be shot at or even frowned upon by the bartender, but he may get sweet soda instead of sparkling water by a mere call for "Scotch and soda." On the other hand, in a great many bars, notably in Montana, an order for a "ditch high" is perfectly well understood; it means a highball concocted of bourbon whisky and the stuff that runs in irrigating ditches. One Sunday morning I was awakened by a happy group of mixed Scandinavians who insisted that I sit up in bed and gulp a tumbler of bourbon mixed with sugar and a touch of water. It was not bad, either. One prominent Scandinavian-American, Governor Val Peterson of Nebraska, part Dane and part Swede in lineage, comes near being a teetotaler. When he is pressed, his favorite tipple is a Danish cordial called cherry *Heering*, whose alcoholic wallop would scarcely faze a mouse.

One of the nation's longest bars used to stand on the bare prairie alongside the Soo Railroad in North Dakota. It was a few miles from the scene of construction of Garrison Dam, but neither it nor the numerous other lures of the kind seemed to attract the great outpouring anticipated from the latter-day construction workers. Unfortunately the long bar burned down.

Kansas and Iowa have been the driest of the basin states,

legally speaking. Since the repeal of prohibition the only legal liquor in Iowa has been "package" (bottle) goods in state-owned stores, but it is doubtful that any larger Iowa town has lacked a place where you could go and buy a drink; a legitimate club perhaps, though not necessarily limited to the well-to-do, or a fraternal organization, or just a "key club," where a fellow made the requisite arrangements, became possessor of a key, and let himself at will into a full-fledged saloon.

Kansas is another matter. Doggedly the good people of Kansas clung to prohibition until 1949, while trucks and other vehicles poured the stuff all over the state year in and year out. A really thirsty person never had any difficulty in finding a slaking-place. Shortly before Kansas woke up and legalized liquor—package goods only—a couple of newspaper men from the East were assigned a suite on the main floor of a hotel, built circa 1875, in a northern Kansas town. They found delightful rooms with tall, picturesque windows (incidentally lacking shades), some after-thought plumbing in a dark corner, and some really good antique walnut furniture with marble tops. The guests, who were not apprised of the hotel's modern annex, were told that this was the gubernatorial suite. Settling down to their writing tasks, they were soon surprised to note a stream of acquaintances and even perfect strangers passing through the suite, from the lobby writing-room to a back door. Then the basement below the suite grew noisy with laughter, jukebox music, and clinking glasses. It proved to be the town's main speakeasy, whose only interior entrance was by way of the "gubernatorial suite" and a cavernous "secret" staircase. The place had an innocuous basement street en-

trance also, with a mirror in the door—a mirror to the hopeful customer, that is; from inside it was a full-scale scanning screen for studying the would-be entrant. It also was equipped with a collection of dirty phonograph records that no wide-open saloon would tolerate.

Nebraska has local option by counties; some are dry, some are wet. Omaha is legally wide open, but not far away the capital, Lincoln, is in a non-saloon county. There the visiting politicians and native thirst-bearers have to buy bottles and pour their own drinks at steak houses, a specialized kind of restaurant. In Montana the state is the liquor wholesaler, a situation that would appear to be ready-made for political pressures. Some of the most picturesque saloons, with old-time flavor, are to be found in Montana, Wyoming, and the mountain towns of Colorado. They really are not too different from the cafés of Times Square, the Loop, or Nob Hill—no shooting and no wild-eyed prospectors. Yet there is a different feeling, perhaps owing to the breezy everyday garb or the easy-going ways of the customers. At that, it is surprising how many liquor emporiums in all parts of the basin, including some pretty small towns, have gone modern, with chrome, neon lights, plastic leather cocktail nooks, and waitresses in fancy aprons.

Missouri permits full sale by the drink, but only in incorporated cities of 20,000 or more, while package liquor is available everywhere. The 1950 census raised some difficulty; for instance, Columbia, seat of the state university and other colleges, found itself raised to the saloon class and began to worry. Missouri law since repeal piously omits using the vicious term "saloon"; "tavern" seems to be preferred, but they are saloons just the same. A puzzling legalistic twist of

the Missouri code is the strict observance of Sunday, by the clock. On weekdays saloons can stay open until one thirty a.m., but on Saturday, the big night, they are required to close at midnight. Some of them, however, take advantage of the other face of the clock and reopen at midnight Sundays for an hour and a half.

South Dakota law permits cities to have local monopolies of the retail liquor trade. Several of the smaller cities have taken advantage of this, including Pierre, the capital. In 1949 Pierre, which had 5,700 people, made a net profit of about $80,000 from its "municipal cocktail lounge," the only saloon in town. In spite of common theories of keeping the government out of private enterprise, supporters of this device say it works well in communities where dry sentiment is strong and commercial bars might not be tolerated.

The New Yorker reported not long ago that Northwest Airlines is the only domestic air route serving liquor. Among states for which it holds liquor licenses are both Dakotas and Montana, but, the magazine said, "over South Dakota it's illegal to serve a spendthrift."

It is sometimes a strangely conservative region. At a banquet one evening a newspaper man was seated between the wives of two basin governors. They were away from their home states, in a friendly crowd, and at an inconspicuous table, but they quailed when cigarettes were offered, though both smoke. One accepted a cigarette and smoked it rather furtively for fear her husband might see her from the speakers' table, but she declined a second. The other lady took a rather longing look at the pack, but said that her husband would be furious if she smoked in public.

Turning to gaudier vices than the cigarette, the Mis-

5. *Medicine Creek Dam, southern Nebraska. The dam is built of rolled earth, is faced with stone, and has a concrete spillway.* Lyle C. Axthelm, from Bureau of Reclamation.

6. *How irrigation works. The broad ditch, winding down a natural grade, feeds lateral ditches that serve farm fields. The high ground at right center is dry.* BUREAU OF RECLAMATION.

souri basin is a pretty clean area. Time was, in the heyday of Boss Tom Pendergast, when Kansas City was the most sinful place in America. Gambling was wide open there. The boss had a state road paved extra wide to serve a race track he sought to promote. There was a restaurant where the waitresses wore high heels, a smile, and an apron. All that is gone. Since the theft of ballots from a courthouse vault a few years ago and the later murder of would-be boss Charles Binaggio, Kansas City has become a quiet, peaceable city.

Council Bluffs, Iowa, has had some experience with gamblers in the nation-wide efforts of the easy-money boys to run wild in recent times. It is an industrial satellite of metropolitan Omaha, across the river.

In most of the basin, however, it would be hard to find any gambling other than a poker game in a back room or an occasional slot machine. It has been different in Montana, however. Slots were numerous there under a law permitting them in non-profit "social" clubs. I joined such a club once in company with a Senator's secretary and a leading liberal (the latter used a fake name). This club was the side room of a saloon in Billings. To join, you gave your name to a man at a little table in the open doorway; he said "All right," and you were thereupon a member with all the rights, privileges, and appurtenances thereunto belonging. The appurtenances were two long rows of one-armed bandits for every coin from a nickel to the silver dollar. At the social club in Helena, the capital, where someone will vouch for almost any stranger who wears a coat and necktie and is not definitely known to be opposed to the vested interests, the rows of slot machines are a bigger attraction than the

busy bar or the well-laid dinner tables. In the 1950 election Montana voted down by 2½ to 1 a proposal to permit general, wide-open operation of slot machines under county option. In the campaign against the scheme, the left-wing *People's Voice* of Helena said: "$20,000,000, plus, was the estimated 'take' of one-armed bandits in Montana during 1949. This represented for the most part money that DID NOT go to pay grocery bills, buy shoes for the kids and generally contribute to a more prosperous life for all the people of Montana. Should the racket be given the green light for wide-open operation, with slots in cafes, stores, filling stations, as well as liquor-gambling joints, the drain on our state's economic life could easily be doubled."

Travelers at Helena as late as 1945 swore that they found a neon sign on the main street, the erstwhile "golden gulch" of mining days, advertising the location of a well-known bawdy house. The lady who ran it sometimes sat on a stool at a popular saloon-café next to a prominent professional man and discussed her business problems with him while they had breakfast.

Every state in the basin has its public university and agricultural college. Some of these are noted in given fields of learning—also, from time to time, in football. Nevertheless, a lament for years, particularly in the western and northern portions of the basin, has been that many of the more promising young people of both sexes leave home to seek careers because they cannot find sufficient opportunity in this region.

There are, in this hinterland, and by no means confined to its larger cities, plenty of evidences of culture, good taste, and good breeding, but they seldom obtrude. One of

the external evidences is to be found in the architecture of many public, private, and semi-public buildings. Two examples of good contemporary design come to mind: the conservatively done City-County Building at Casper, Wyoming, and a Catholic church on modern lines at Bismarck, North Dakota. Eight of the basin states have capitols in the traditional dome style, but Nebraska and North Dakota have outstanding examples of twentieth-century design. Nebraska's is a striking white stone shaft. Some persons consider North Dakota's simple tower design of granite and marble even more impressive. It is a masterpiece in its way. It gleams against the horizon on a bench above Bismarck. Inside, its ornamentation is restrained but telling. One of the boasts about it is the economy with which it was erected not many years ago.

The Missouri basin is not known as the home of many writers of note. It does have, for example, however, such a well-known regional author as Joseph Kinsey Howard, of Montana fame. Gene Fowler came out of Denver. It has had its cowboy painters in the past. Today's outstanding artist in the basin surely must be Thomas Hart Benton, of Kansas City. Some of his notable murals grace the Capitol at Jefferson City, Missouri. No doubt the most widely circulated painting of the Missouri basin was the bright, romanticized version of *Custer's Last Stand.* The work of Cassily Adams, who came out from the East, reproductions of it were distributed among many of the nation's saloons by Anheuser-Busch, the justly celebrated St. Louis brewery.

Almost everywhere in the basin, as in most of America, the live theater has disappeared, except for those relatively few cities and towns with little-theater movements. Only

several larger cities get the limited professional productions still on the road. Central City, Colorado, with its ambitious summer shows, nestles in the mountains just inside the basin. But it is a rare town that offers any real choice between movies.

In one South Dakota town the downtown streets echo pleasantly at times with the music of a carillon. A tired motorist may be passing through town and find his thoughts lightened by the calm strains of *Faith of Our Fathers.*

Hotels, in their way, are a reflection of local culture. Plenty of Missouri basin towns, and some cities, still have hostelries about which the less said the better. The good thing, however, is that a great many of the small and medium-sized towns of the valley have excellent hotels, places either built within the last decade or restyled and refurbished in that period. You can go to some towns that as a whole are unprepossessing in appearance and walk into your hotel room to find *décor* in the best modern taste and, frequently, good housekeeping. You can drive through the dusty, grimy oil-refinery city of Casper and be pleasantly surprised by a few modern touches, such as the electric eye that opens the outer doors of the Gladstone Hotel. You can also get some other surprises. Take the creaky St. Charles Hotel at Pierre: place the plug in some of its old bathtubs, then turn on the faucets, and you will find the plug dancing on top of a jet of water. The water supply enters by the orifice that serves as the drain. At a growing number of basin towns the newer lodges for motorists are superior to the hotels and, in fact, are reserved by local reception committees for distinguished visitors. Such a

place, for instance, is the air-conditioned Skyline Motel at Concordia, Kansas.

It is not difficult at all to drive fifty or a few hundred miles for business or social reasons in nearly all parts of the basin. People do it all the time. A fifty-mile drive there is far easier than crossing the Chicago Loop.

The zone line between central time and mountain time, which cuts down through the center of the Dakotas and Nebraska and into Kansas, is just about the standard boundary for the silver dollar. Everywhere west of there the traveler and the native alike get their change in cartwheels ninety-nine times out of a hundred. A few of the pretty, jingly things can wear out any trouser pocket, but they are a stubbornly cherished sign of the area, like the mint julep of Kentucky or the dark eyeglasses of Hollywood. Dollar bills are to be had only on request; you feel somewhat suspect if you ask for them. Except for Colorado, this is not silver country—just a hard-money region.

Rugged, independent, individualistic people like those in the Missouri basin are bound to have a goodly quota of strong and colorful "characters." Every section of every state in the valley has them. A lot of them are leaders, some are stooges or figureheads, some just bores. Listen to them and often you may discover hidden reservoirs of wisdom or talent. Or the pay dirt may be different: tales of the "old days" and the old ways.

Man's gregariousness naturally has its regional twists. Nebraska's governors maintain a thriving "Great Navy," all members of which are Admirals, a rank that many assorted honorable outlanders have attained. Rapid City, South Da-

kota, conducts with considerable eclat the Black Hills Tepee of the Singing Tribe of Wahoo. The Army Engineers have a mythical organization known as the River Rats, with various ranks. Businessmen of Yankton, South Dakota, have set up the Yankton Burrow of the River Rats. Once the press corps enlivened a dull session by distributing memberships in the "Permanent Congregation" of those regularly attending meetings of the Missouri Basin Interagency Committee. The old gag of having the men of a town grow whiskers in observation of some civic celebration can be found in the basin. Helena was doing it for a "pioneer days" affair in 1949, and even the newly sedate Kansas City did it on a big scale for its centennial in 1950.

Somewhere east of the time-divider and more nearly corresponding to the twisting boundary between the humid and the semi-arid zones is the line of demarcation for masculine footwear. West of this line, in a great deal of the basin, a great many of the men, in places a large majority of them, wear high-heeled cowboy boots habitually. Young men working on motor trucks have been observed wearing them. Fellows around an oil rig in Wyoming may use them, and so may a lot of other people who are not normally on horseback. It is a custom and a badge of the country. Many ranchers and businessmen in the cattle districts also find it comfortable to go everywhere in well-cut trousers of gabardine or corduroy, with side-slash pockets, of a design suitable for the saddle, with matching coats somewhat like the Eisenhower battle jacket of World War II. Leg-protecting chaps are seldom needed in this region.

Daylight saving is conspicuous by its absence in the Missouri basin: wheat, cows, corn, and sheep all run by sun

time. The nearest intrusion is in St. Louis County, Missouri, where daylight saving spills over informally from the city.

North Dakota for several years was the only state in the country which had no parking meters in any town. The farmers did not like them, and the farmers' feelings are mighty important in that and other basin states. A referendum was submitted a few years ago and the people banned the contrivances. The legislature permitted their restricted return in 1951. Incidentally, the time-honored custom of Saturdays in town for farm families continues strong throughout this valley. Wyoming, Montana, North Dakota, South Dakota, Iowa, and Kansas were among the seventeen states of the country from which no cities sent applications for federal slum-clearance aid under the 1949 Housing Act. This is understandable, for, with a few possible limited exceptions, the cities of these states do not have slums of the type envisioned by the federal statute. Kansas City, Missouri, does have bad slums, but it has embarked on an ambitious program of broad civic improvements.

All through the war period of the first half of the 1940's, and to a considerable extent in the recovery period of the second half, the Missouri basin enjoyed generally good income. It was blessed with a prolonged cycle of more moisture than usual. There has been no strong indication that a new dry spell might be approaching, but there has been a falling off of income in many areas while the national inflationary trend has continued. A reflection of the drop in income was seen in a summary statement by the Federation of Tax Administrators after analyzing returns for state

income taxes for the fiscal year 1950 compared with the preceding year. The statement, issued through the Public Administration Clearing House, said:

"Personal income tax collections dropped in at least 12 of the 31 states that impose these levies. The declines, which ranged from .5 of 1 per cent in North Carolina to 30.3 per cent in Kansas, largely reflected the sharp, almost nation-wide drop in farm income during calendar year 1949. While U.S. Department of Commerce data indicate declines in all categories of income, except governmental payments, the largest was a 22 per cent drop of farm income. A decline of 45 per cent in North Dakota's farm income was accompanied by a decrease of 25.3 per cent in individual income tax yields. In Montana, farm income was 44 per cent under 1949 and tax collections declined about 11 per cent. Georgia, Idaho, Iowa, Kansas and Oregon were other states in which lower farm income effected significant reductions in personal income tax collections."

Decline in corporate income taxes was more widespread than that in personal income taxes, the statement added. Of eight states in which corporate income taxes declined by more than 20 per cent in the year's interval, only Montana, perhaps significantly, was in the Missouri basin. Montana has some big business, while corporate enterprise is not strong in most of the basin.

Secretary of Agriculture Charles F. Brannan was making an impassioned defense of his ill-starred plan for agriculture at St. Louis in the spring of 1949. He related that the nation's average farm income was $609 a year, contrasted with an average non-farm income of $1,565. He went on: "Some people will say: 'You've got a lot of share-

croppers in that 609 figure.' Sure we have, but we also have Tom Campbell, the big wheat farmer at Great Falls, Montana, and a lot of other big ones—and there are a lot of little people in that non-farm group, too."

The farmers of the Missouri basin are a well-organized bloc. In Missouri the leading organization, claiming far more members than any other, is the Missouri Farmers' Association. It operates co-operative marketing and supply establishments of various sorts and keeps a close hand on the legislature, which, as in the other basin states, is set up for rural domination despite the heavy population in several of the cities. The Missouri Farmers' Association, or MFA, is on the whole politically conservative, yet it is one of the ardent advocates of a Missouri Valley Authority on the pattern of the Tennessee Valley Authority.

In many parts of the basin the Farm Bureau Federation has strong local units. This is a national organization of conservative character, usually working closely with the Department of Agriculture, the federally backed state "aggie" schools, and the county farm agents, who are supported by the state-federal system.

Elsewhere in the basin, notably in large portions of Montana, the Dakotas, and Colorado, the National Farmers' Union is strong and active. This is a left-of-center organization, willing to back unpopular causes and take the liberal side of public questions. It has a big system of co-ops and an insurance service. Tall, bluff Jim Patton runs it from extensive modern offices on the outskirts of Denver, and it maintains a branch office at Washington, where chubby, ruddy Ben Stong is an effective publicist. North Dakota has one of the vigorous state units, with a modern headquarters

building at Jamestown. The NFU strongly favors a Missouri Valley Authority.

The big stockmen, operating on a large scale, have their own associations, more like trade groups than like a farmers' assembly. The irrigation states have state associations aligned with the National Reclamation Association. Among their active backers you are more likely to find the Chamber of Commerce people, the railroads, other business interests, and the state or district water officials than the irrigation farmers themselves, who are busy on their 160-acre plots of reclaimed near-desert.

Politically, the Missouri basin is something of a hodgepodge, but one fact stands out: it is predominantly Republican and conservative. This does not mean that it spurns New Deal aid or any other federal assistance. On the contrary, it wants just about all it can get of that, which means that the wealthier parts of the nation must, in effect, subsidize this great valley. There is some very good justification for this, as manifestly large states existing on an agricultural economy, but with no more population than some secondary Eastern cities, cannot possibly pay by themselves for many of the king-size improvements that must be made. Without federal aid, Wyoming could not build highways vitally needed by the whole country. Nor could South Dakota erect big dams for irrigation and power. Nor could even relatively rich Missouri pay the huge bill for flood control.

In the face of this situation, and right in the middle of the huge program of improvements under the Interagency plan, requiring annually tremendous appropriations from Washington, the basin has remained determinedly Repub-

lican as a whole. Missouri and Montana are the only two basin states with Democratic governors and state administrations. Missouri long has been pretty generally regarded as a Democratic state, especially with the growing importance of that party's vote in its big cities. Montana in this column is accounted for by a strong labor element, notably in the copper industry, and a leftish inclination of its farm people, and perhaps also by a general state of protest against the vested interests entrenched there. Colorado had a Democratic administration, but went Republican in the 1950 election. Wyoming's senators are Democrats through a long combination of political circumstances, but its lone congressman is a Republican. Of the 20 senators from the basin states, 13 are Republicans; the number was 14, but Missouri made a switch in the 1950 election when the nation's general trend was the other way. Both senators are Republicans in each of these states: Kansas, Nebraska, North Dakota, South Dakota. The basin states had 34 Republicans and 17 Democrats in the House in the Eighty-second Congress, a gain of four Republicans and a corresponding loss of Democrats since the Eighty-first. The Democratic losses were in Nebraska, Missouri, and Colorado.

Politics is a serious business in these states, but must seem like a Lilliputian affair to practitioners in more populous regions. If your state has only half a million or so inhabitants, including the aged and infirm, children, felons, and maybe some Indians who have not yet gained the ballot (some of them do have it), a state-wide vote of 150,000 might be an optimum, 90,000 good. In that case, even if you were running for the dignified office of senator or

governor, you would go after every little crossroads gathering you could find to pick up a few votes. It is not a bad idea at that, from the people's standpoint. Some of these basin politicians must know their states and their people far better than officeholders in the big commonwealths know theirs.

Some nice distinctions of party and faction are to be found in this country. Just by way of illustration, take one of the most intricate cases: North Dakota. A politician on the dominant side there sought to explain the situation by oversimplification recently. He said: "Politics is pretty hard to follow here, but goes something like this: The Republicans are split into two groups, the conservative wing, or ROC—that is, Republican Organizing Committee—which is in control, and the old Nonpartisan League, which ran the state once upon a time. Then there are the Democrats, who are the minority. They are split up into left-wingers, New Dealers, the Farmers' Union, and so on. See?"

In Montana, politics is strongly colored by dark talk of the behind-the-scenes control and manipulation by the "interests." The common saying is that this or that order, policy, or political decision emanated from the "sixth floor." That is usually interpreted to mean the executive offices of the Montana Power Company in its building at Butte. The big villain, however, whenever a Montanan wants to fix the blame for politics, the weather, bad business, or poor fishing, is the Anaconda Copper Mining Company, industrial behemoth of the state. If things are really bad, the power company is tacked onto the asserted villainy in the role of ACM's errand boy. Sometimes critics toss in the state's three railroads, the Northern Pacific, the Great Northern,

and the Milwaukee, to make a clean sweep of the "interests." A great deal has been written about the position of the interests in Montana, and it is not my intention here to prosecute or defend the case. It should be noted, nevertheless, that without doubt ACM and the power company do have far-flung activities in Montana, and that the people of the state have had some persuasive reasons to feel that they were being selfishly exploited.

Even in such a bitter political atmosphere politics can have its lighter side. I was in Montana shortly before the primary election of 1946, when veteran Senator Burton K. Wheeler was losing the race for renomination on the Democratic ticket and doubtless knew it full well. Once a fire-eater, he had turned conservative. His successful opponent was Leif Erickson, lawyer, who was sure of the Scandinavian vote if of nothing else. Mr. Wheeler was broadcasting his first main speech from a picnic one Sunday afternoon. Mr. Erickson stopped his car out in the country and flung a radio aerial over the barbed-wire fence of an Indian reservation. His snorts of derision and dissent prevented me from hearing the address. A few days later I rode down another highway with Senator Wheeler, and the car radio was tuned in on the Erickson daily talk. Same thing: the Senator fussed and fumed so much that his rival was drowned out.

Nebraska gave the country the late Senator Norris, liberal Republican, who was the father of the Tennessee Valley Authority. Nebraska is the one state in the Union wholly covered by public electric-power supply districts. Nebraska has the only unicameral state legislature and a useful preferential primary for President. All of this pre-

sents a political anomaly, for Nebraska today is strong for the conservative way of basin development. Nevertheless, Nebraska has a vigorous, outspoken governor in Val Peterson. He has been re-elected repeatedly to that office and as chairman of the Missouri River States Committee, an informal but politically powerful organization representing the governors of the ten basin states. Mr. Peterson has openly raised controversial questions in the basin time and again, when more timid politicians would have remained silent or requested executive sessions. He has insisted on and obtained answers, furthermore. Cynics have said he spoke with an eye cocked to the press table, but there has been more substance to his actions than that. Awhile back, people were saying also that he talked like a man running for President, but later he sounded more like a man with an eye on a Senate seat in '52. He is a youthful chap who owns, and used to edit, a country newspaper and who used to be a university professor and an Army officer in the Pacific in World War II. Today, as a reserve colonel, he would move from the Capitol at Lincoln to Offutt Air Base at Omaha in the event of war and become deputy director of matériel at headquarters of the Strategic Air Command, which would deal with offensive atomic warfare.

It is fair to single Governor Peterson out for special comment because of the position he has occupied in basin affairs. His predecessors as chairman of the valley governors were soft-spoken, earnest Sam C. Ford of Montana and unassuming, bashful-looking M. Q. Sharpe of South Dakota. Later and through 1950 Governor Peterson had able collaboration from neighboring Republican governors who served with him on the Missouri Basin Interagency Com-

mittee. These were his good friends George T. Mickelson of South Dakota and Fred Aandahl of North Dakota. Mr. Mickelson has retired voluntarily, while Mr. Aandahl has gone on to the national House of Representatives. At many an Interagency session or governors' committee meeting there has been a snappy triple play: Peterson to Mickelson to Aandahl, or South Dakota to North Dakota to Nebraska, or Fred to Val to George. They were friendly rivals in various things, notably on the ticklish question of distribution of the hydroelectric power to be generated by the new dams; but they worked well together and frequently stirred things up to good avail while others sat silent.

Just one problem really troubled their way: that of the official precedence of the governors of the two Dakotas. Both states were admitted to the Union on November 2, 1889, and it seems that there is no record of whether the papers were signed first for North Dakota or South Dakota. This makes protocol decisions tough.

An outstanding member of the national House of Representatives is the veteran Clarence Cannon, Missouri Democrat, chairman of the House Appropriations Committee and as such a powerful figure. His home district lies on both sides of the Missouri basin boundary.

Some of the senators from the basin may be singled out for a variety of reasons. James E. Murray, wealthy liberal Democrat from Montana, chairman of the Senate Labor and Public Welfare Committee, has been the leading advocate of a Missouri Valley Authority. He also was one of the sponsors of the highly controversial national health bill, and he has been active in various movements intended to benefit the common man. Kenneth S. Wherry of Nebraska,

Republican floor leader of the Senate, has been in the forefront of the partisan maneuvering of recent times. Joseph C. O'Mahoney, Wyoming Democrat, has been a Senator since 1933. As chairman of the Interior and Insular Affairs Committee he has had the leadership in handling governmental reorganization proposals advanced by the Hoover Commission. An important amendment to the law for the Pick-Sloan plan bears the name of Senator O'Mahoney and Eugene D. Millikin, Colorado Republican Senator. The other Senator from Wyoming, Dr. Lester C. Hunt, gained favorable attention as a member of the Kefauver Crime Investigating Committee. Senator Hubert H. Humphrey, Minnesota Democrat, a former mayor of Minneapolis, is something of a New Deal firebrand. James P. Kem, Republican, Missouri's senior Senator, is an arch-conservative from Kansas City.

And then there is Senator William Langer of North Dakota, labeled and elected as a Republican, but openly unorthodox and unfettered politically. He started out with the backing of the Nonpartisan League, and he aided the presidential campaigns of Robert M. La Follette and Hiram Johnson. Twice he was elected Governor of North Dakota and twice Senator, but his political career has been stormy and seamy. His biography in the *Congressional Directory* states, among other things, that he was the "only person ever to be arrested in any English-speaking country for filing an affidavit of prejudice against a judge," and that "his first teacher was Alice Rutledge, a cousin of the sweetheart of Abraham Lincoln, Ann Rutledge." Mr. Langer was one of the old isolationists, with a record of opposition to some of the key measures for national defense in the pe-

riod before Pearl Harbor. He has been largely ineffectual in the Senate; sometimes he has taken a liberal stand, sometimes the opposite. In 1950 he collapsed on the Senate floor in a filibuster against the McCarran Communist control bill. He has inveighed against nepotism, but Robert S. Allen, the columnist, has asserted that he had family connections on the public payroll. Winston Churchill was bitterly attacked by the Senator on the Senate floor in 1949; Mr. Langer included an assertion that the British statesman had fought against this country in the Spanish-American War—a charge that was promptly denied. Mr. Langer participated in a 1945 minority report supporting the Murray bill for a Missouri Valley Authority. On the other hand, a Senate investigation of notorious Kansas City vote frauds, sought by Senator Kem, was blocked by Senator Langer as a member of the Judiciary Committee. He opposed the Marshall Plan to aid Europe. He introduced a bill to help Ellen Knauff in the prolonged controversy over her exclusion from the country, but he was unable to get it out of committee. He cast one of the two votes against American membership in United Nations. In his two separate terms as Governor in the 1930's he had a hectic time; he was indicted over the handling of public relief, but eventually won acquittal. His career led to charges of moral turpitude when he entered the Senate, but after a long delay the Senate voted to seat him, 52 to 30.

Despite the presence in office of men like Senators Langer and Kem, abundant evidence developed in the first five years after World War II that the Missouri Valley no longer is the stronghold of national isolation which it was of old. For one thing, it became acutely aware, especially

along its broad northern reaches, of the closeness of Russia by air via the North Pole. What change in the valley's attitude, if any, will come out of the great debate over foreign policy and the conduct of the Korean war, aroused by President Truman's removal of General Douglas MacArthur, only time can tell. Quite possibly the answer may be found in the election of November 1952.

William M. Blair of the *New York Times* has had occasion to look into the attitudes of the people of the valley. In a discussion shortly before the MacArthur ouster he said:

"There is concrete evidence that the basin has shed its shell of isolationism. Many of its farmers have visited Europe since World War II, and they have returned virtually as missionaries, in support of the needs of Europe, as the hope of saving the world. The fact that many of the people of the valley are only one, or two, or three generations removed from Europe has had something to do with the change. There are a lot of displaced persons from Europe in the Missouri basin now, and much of the urge to get them there came from the Lutherans and Catholics of the region. Politicians in this area have been finding their strongest talking points in their campaigns now are on international affairs. The results of the 1950 elections were held by some to have reflected dissatisfaction with the handling of the Korean war—not objection to having gotten into the war, but displeasure with the way in which the national administration was prosecuting it."

In a region as agricultural in character as the Missouri Valley, it is no surprise to find that the number-one domestic question is the farm problem—that old issue which has been in the national mind for three or four decades.

This area is vitally concerned in the national policies that affect its primary livelihood, so its people think and talk much about the prices, controls, and aids for livestock, grains, and other crops. Perhaps an explanation of the willingness of this largely Republican and anti-New Deal, anti-Fair Deal region to accept federal aid on the grand scale is traceable to the traditional thriftiness of the farmer. He is willing to have someone else provide for him—and in this region he is fully conscious of the vital importance of his products to the welfare and mayhap the very safety of the nation and the world.

CHAPTER VI

The Towns Get Bigger, the Country Smaller

Rural districts of the Missouri basin have been losing population steadily for a long time; its more important urban centers, both large and small, have been gaining. This is in line with what has been happening generally throughout the United States, but in the basin the trend is so sharp as to be alarming. One reason for concern, of course, is that the region's economy continues to be agricultural while the desired new industrialization has not yet developed. An obvious finding is that the better and more desirable centers have grown, but that vast geographical areas in this valley have been losing their people, becoming more and more lonely and deserted. Many little towns and villages are withering. The wide-open spaces are becoming wider and more open.

There are now in the Missouri Valley, as closely as can be ascertained, about 7,576,000 inhabitants. This is 5 per cent of the population of the nation. If the basin were populated in proportion to its area, it would have about 25,000,000 people. The basin's population as a whole grew only 3 per cent in the decade between the census of 1940 and that of 1950; during this decade that of the nation increased 14.4 per cent. Growth of a limited number of centers accounted for increases that were, in the aggregate, more than twice as

big as the over-all increase in the basin. In other words, the rural districts fell off sharply and the basin showed a net gain only because of its more prosperous towns and cities.

Virtually one third of all the basin's people dwell within the limits of 52 cities of 10,000 or more each. About one quarter of them actually live in 16 cities of 30,000 or more. You can narrow it down ever farther: one fifth of them are in eight cities of 75,000 or more, while one sixth of them are confined to the two neighboring Kansas Citys, Denver, and Omaha. The moral of these mathematical exercises is again the spreading scarcity of the rural population.

It became possible only recently to make a detailed analysis of the population when Charles E. Brokaw, Department of Commerce member of the Missouri Basin Interagency Committee, compiled preliminary 1950 population census data by counties. No one had previously tried to narrow the picture down that far. Mr. Brokaw included all counties either wholly or partly in the basin and excluded counties lying beyond the basin boundaries. It would be impossible to adhere exactly to the actual confines of the valley, for records are not kept that way. It is true that the Brokaw figures somewhat exaggerate the facts by including portions of a relatively small number of counties beyond the exact boundary, but study of the maps and the background shows that this unavoidable error is small.

Following his rule literally, Mr. Brokaw included in his list St. Louis County, Missouri, and El Paso County, Colorado, because minor portions of those counties are in the basin. I have completely eliminated data for these counties for purposes of this analysis: they would unduly exaggerate the showing. This, incidentally, constitutes a partial offset

for the non-basin portions of other counties that are left in. St. Louis County is a very populous suburban area of the city of St. Louis, which city is independent of any county. The strip of this county inside the Missouri basin, however, has a relatively small part of the county's population or industry. Colorado Springs is in El Paso County, but in the Arkansas River basin, and only a tiny mountainous fringe of this county is in the Missouri basin.

By states, the population of the basin, compiled as indicated above, is divided as follows:

Missouri	1,752,422
Nebraska	1,318,079
Kansas	1,170,169
Colorado	790,801
Iowa	765,296
South Dakota	650,025
Montana	450,807
North Dakota	344,409
Wyoming	245,195
Minnesota	88,924
TOTAL	7,576,127

In comparison, the population figures for this territory, compiled in the same way for previous decennial counts, were as follows:

1940	7,354,536
1930	7,463,135
1920	7,106,686

The net gain for the basin between 1940 and 1950 was 221,591, taking into account increases in eight states and decreases in two states, as follows:

Colorado	165,315 gain
Wyoming	37,106 gain
Kansas	30,770 gain
Missouri	18,328 gain
Montana	11,294 gain
South Dakota	7,054 gain
Nebraska	2,245 gain
Minnesota	320 gain
North Dakota	15,833 loss
Iowa	35,008 loss

Against this over-all gain of 221,591 was an aggregate increase of 487,540 persons in main centers of eight of the states (all but Iowa and Minnesota). In each of these states except North Dakota, the gain in the larger towns or cities was appreciably more than the gain in the entire basin portion of the state. In North Dakota the gain in principal centers was equivalent to only about one half of the over-all decrease. Analysis shows that the spots where the increases occurred, for the aggregate figure of 487,540, were the following towns and cities and their immediate environs:

Denver Denver suburbs Northern piedmont	Colorado	174,069
Cheyenne Casper Cody Riverton Laramie Rawlins Worland Newcastle	Wyoming	39,883

Kansas City Topeka	Kansas	60,872
Kansas City Springfield Columbia Rolla St. Charles Washington	Missouri	112,063
Billings Great Falls	Montana	24,970
Sioux Falls Rapid City Aberdeen	South Dakota	30,586
Omaha Lincoln	Nebraska	37,243
Bismarck Minot Riverdale	North Dakota	7,854

No appreciable offset for the over-all decline in population occurred in the Iowa segment of the basin. Sioux City, noted meat-packing center and the largest city in the segment, had a gain of only 332 persons, while Council Bluffs went up by 3,745.

Checking back three decades, to 1920, shortly after World War I, we find that the basin population has increased by only 469,441 in all that time, or 6.6 per cent. The increase in the 1940–50 decade alone was almost one half of this thirty-year change. That is one encouraging element for the basin. In the three-decade period three states showed a drop in population within the basin: Montana,

North Dakota, and Iowa. The basin's net gain of 469,441 in the three decades was divided by states as follows:

Colorado	294,918 gain
Missouri	86,210 gain
Wyoming	84,146 gain
Kansas	31,200 gain
Nebraska	21,707 gain
South Dakota	13,478 gain
Minnesota	7,138 gain
Montana	812 loss
North Dakota	29,497 loss
Iowa	39,047 loss

One sixth of the nation's territory had an increase of less than 470,000 population in almost one third of a century! That fact alone cries out for development of the Missouri basin. Why, that gain all over the valley in three decades hardly exceeds the number of inhabitants of the largest metropolis, Kansas City! One point of comfort: the 1950 basin population was a new high mark.

It is noticeable that there was a decrease of 108,599 inhabitants in the decade of 1930–40. Actually, there were gains in six states and losses in four—including three with sharp drops. The decreases were caused mainly by the successive droughts and by the Dust Bowl era on the prairies. They aggregated 153,915, divided as follows: Nebraska, 62,130; South Dakota, 45,861; North Dakota, 37,561; Iowa, 8,363.

There are 465 counties wholly or partially within the Missouri basin, in the 10 states. Three quarters of them, 346 counties, lost population between 1940 and 1950; 157 counties lost population consistently throughout the three

decades, 1920–50. These were divided as follows: Missouri, 40; Nebraska, 33; Kansas, 24; Montana, 19; South Dakota, 14; Iowa, 13; North Dakota, 8; Colorado, 5; Wyoming, 1; Minnesota, 0.

On the other hand, only 119 counties in the basin gained population between 1940 and 1950, and only 52 gained consistently from 1920 to 1950. South Dakota had the fewest consistent gainers, two counties, while the largest number to a state was seven each in Colorado, Kansas, and Wyoming.

Colored on a map, the counties that have been losing their people show up all over the basin. If any pattern is to be perceived in such a map, it is roughly this: the gains have occurred in spotty fashion along the flood plain of the Missouri River proper and in the valleys of the North Platte, the Yellowstone, and the Kansas and its upstream branches, and in the piedmont country of Colorado, Wyoming, and Montana. The rises in population seem, at least on a superficial glance, to be connected with concentrations of industry and of the jobbing and distributing trade, and with some of the more fertile and better-watered land.

The gasoline motor and the Diesel engine have had a great deal to do with the dwindling rural population of the Missouri basin, as of other farming areas of the United States. They have signalized a growing tendency to mechanization of the farm and the ranch in the 1940's and particularly, in some areas of the basin, during the latter years of that decade. Doubtless the gradual spread of rural electrification constitutes a phase of this mechanization, for electric power has been a boon on farms reached by its costly lines. The more a farmer can do with machinery, the

less hired help he needs and the less incentive his sons find to stay on the place. Conversely, the more machinery he uses, the more land he can handle. So the size of farms grows and the number of farmsteads—which means people—dwindles.

Tractors, combines, other machinery powered by motors that burn gasoline or low-grade Diesel fuel, and a wide range of farm equipment powered by electric motors have put in their appearance all over the basin. The motor enters into the picture also in the long-haul truck that takes farm products to market or brings food stocks to stores, and in the family automobile that facilitates trips to better shopping, amusement, and medical centers than farm families used to be able to reach. The Missouri Valley may not have many fine highways, but in an arid country the car, truck, or tractor negotiates some pretty rough trails a great deal of the time. For proof, watch the dust clouds. Thus mechanization has virtually doomed a great many villages and small towns. People pass them up for better and brighter places to visit or live. Some of these smaller places have persisted primarily as homes for elderly retired farmers. When these oldsters join the last roundup their frame dwellings are likely to remain only as ghost towns.

Fortunately, the decline of human population on the farmlands has not meant that the lands were abandoned. Agricultural production in the basin has been rising markedly in recent years, and in some districts the acreages in cultivation have increased. It seems plain that mechanization of farming is the explanation of this phenomenon of fewer people and more crops. Some agricultural experts are of the opinion that the trend is leveling off. Nevertheless

this truism cannot be overlooked: it takes people to make markets, and it takes markets within convenient reach to convert a regional agricultural economy into an integrated economy in which industry fits naturally and uses the established or available raw products.

Perhaps three of the basin states call for special explanations. Wyoming, with the smallest over-all population and one of the largest areas, offers one of the contradictions of the valley with its 15.1 per cent increase in basin inhabitants in 1940–50. To a very considerable extent this is owing to development of its oil fields. Colorado had a growth in the basin of 20.9 per cent. This appears to be a natural development of a district blessed with good land, a fair supply of water, varied natural resources, a fine climate, and remarkable scenery. Missouri, with almost one quarter of the basin's entire population, gained barely 1 per cent over-all in the decade. Considering its size and its climatic, geographic, and economic location, this showing for Missouri is more striking than that of the other states. Furthermore, Missouri, with only about half its area within the basin, had more basin counties consistently losing population in the last three decades than any other state. Missouri is not dry; it is humid, but it has districts where the land is poor or the vital topsoil has grown dangerously thin, eroding through the gullies and creeks until it has wasted away into the big river. Manufacturing and distributing trades and a pair of college towns, Columbia and Rolla, were all that kept Missouri from showing a decrease in basin population.

Special mention might be made also of Montana, where Billings and Great Falls had growth that offset rural losses.

Billings, nestled in the benches along the Yellowstone, and backstopped by some fine valley land that has been locally irrigated for many years, is a lively, thriving city. It has been showing some industrial advances, including the recent opening of an oil refinery. Great Falls is an important manufacturing center in ACM's copper empire.

Less than half of the people of the ten states dwell within the basin limits; somewhat less than 47 per cent, to be more exact. Aggregate population of the ten states, as entireties, in the final figures of the 1950 census, is 16,268,-036. In the case of Nebraska, of course, the proportion within the basin is precisely 100 per cent, and in South Dakota it comes close to that, as no county in the latter state is wholly outside the basin. For the other states, the percentage of total population that lives in the basin is approximately as follows: Wyoming, 84; Montana, 76; Kansas, 61; Colorado, 60; North Dakota, 55; Missouri, 44; Iowa, 29; Minnesota, 3. In most cases, there is no relationship between the proportion of area and the proportion of population included in the basin; for example, more than two thirds of the area of Colorado, including most of the spectacular mountains, lies in the basins of the Colorado and Arkansas rivers, but three fifths of that state's people reside in the Missouri basin. Many important Iowa communities are in the upper Mississippi watershed. Wichita is among the Kansas centers not in the Missouri basin. In Missouri the majority of 1,250,000 inhabitants of metropolitan St. Louis are not in this basin, yet in a sense St. Louis is the real metropolis of the Missouri Valley.

The top sixteen cities of the basin, with preliminary 1950 census figures of their population, are these:

Kansas City, Missouri	453,290
Denver, Colorado	412,856
Omaha, Nebraska	247,408
Kansas City, Kansas	129,583
Lincoln, Nebraska	97,423
Sioux City, Iowa	84,035
Topeka, Kansas	77,827
St. Joseph, Missouri	75,572
Sioux Falls, South Dakota	52,161
Council Bluffs, Iowa	45,184
Great Falls, Montana	39,006
Independence, Missouri	36,832
Manhattan, Kansas	33,574
Cheyenne, Wyoming	31,807
Columbia, Missouri	31,731
Billings, Montana	31,725
TOTAL	1,880,014

The two Kansas Citys are essentially one community, with a largely invisible and forgotten state line dotted through the heart. A great many persons who dwell on the Kansas side work on the Missouri side, and there is a certain amount of the reverse. Likewise, Independence, home of President Truman, is essentially a residential and commercial suburb of greater Kansas City. Council Bluffs and Omaha are in the same metropolitan district. Lincoln is an up-and-coming place, having grown about 19 per cent in the last decade; it is tending to become industrialized. Manhattan is a college town, fairly near a large established Army post. Cheyenne, the capital city, has benefited from oil, commerce, and transportation.

Basin cities in the next lower bracket (30,000 to 15,000 population) are as follows:

Salina, Kansas	26,141
Rapid City, South Dakota	25,179
Jefferson City, Missouri	24,990
Casper, Wyoming	23,557
Lawrence, Kansas	23,292
Grand Island, Nebraska	22,835
Aberdeen, South Dakota	20,976
Leavenworth, Kansas	20,543
Greeley, Colorado	20,286
Sedalia, Missouri	20,269
Hastings, Nebraska	20,108
Boulder, Colorado	19,916
Bismarck, North Dakota	18,544
Helena, Montana	17,498
Englewood, Colorado	16,619
Laramie, Wyoming	15,497
North Platte, Nebraska	15,390

Englewood is a suburb of Denver.

The next classification consists of the cities of 15,000 to 10,000 population:

Fort Collins, Colorado	14,932
Fremont, Nebraska	14,639
St. Charles, Missouri	14,307
Junction City, Kansas	13,370
Scottsbluff, Nebraska	12,833
Atchison, Kansas	12,759
Huron, South Dakota	12,713
Watertown, South Dakota	12,662
Kearney, Nebraska	12,106
Mitchell, South Dakota	12,062
Beatrice, Nebraska	11,788
Sheridan, Wyoming	11,402
Aurora, Colorado	11,396

Bozeman, Montana	11,252
Norfolk, Nebraska	11,231
Jamestown, North Dakota	10,601
Ottawa, Kansas	10,051
Fulton, Missouri	10,040
Fort Scott, Kansas	9,992

St. Charles is part of the St. Louis metropolitan district. Aurora is another Denver suburb. Fulton, nestled among Missouri prairie farms, was the scene of Winston Churchill's famous "Iron Curtain" speech.

The foregoing lists include the fifty-two largest cities of the basin, with combined population of 2,461,790. Forty-eight of them gained population between 1940 and 1950. Those which lost population are St. Joseph and Sedalia, Missouri, and Ottawa and Fort Scott, Kansas. The largest loss was 565 at Fort Scott, which declined barely below the 10,000 bracket. Eight of the states are represented in the list of the top sixteen cities. The largest city of North Dakota within the basin is Bismarck, near the bottom of the second bracket. The basin corner of Minnesota has only small towns.

Two new little cities popped up on the plains in time for the last census: Riverdale, North Dakota, with 2,551 inhabitants, and Pickstown, South Dakota, with 2,204. They were built "a long way from nowhere" by the Army Engineers as construction towns for two of the big new river projects. Riverdale serves Garrison Dam; Pickstown, named for General Pick, is at Fort Randall Dam. When the dams are completed, a few years hence, many of these people will leave, but a town will always remain at each place for the supervisory and operating personnel. The

7. *The uncontrolled Missouri near Vermillion, South Dakota. Sandbars are becoming islands as the channel shifts.*
Paul Berg, *St. Louis Post-Dispatch* PICTURES.

8. *The Missouri under control at Hermann, Missouri. Here the channel is being trained by dikes into long, gentle curves.*
Paul Berg, *St. Louis Post-Dispatch* Pictures.

permanent sections are well-designed or "model" towns.

Kansas City and Denver have a lively, aggressive manner. They do not have the boredom of the old Eastern cities, but still act as if they were going to go a lot more places yet—and they probably will. After all, they are young; Kansas City has just celebrated its one hundredth anniversary; Denver, the first permanent white settlement in Colorado, will not have its centennial until 1958. Denver, mile-high on the plains, is noteworthy as a community chiefly of small, modest, detached or single-family houses, even for many of its more substantial citizens. Kansas City, spread over a series of hills, is a showier place, where both evil and good have been done on the grand scale. Its current program of public improvements is a bold one, including the cutting of swaths through slums to make modern expressways for traffic. Not long ago Kansas City decided to enlarge its boundaries, wholesale fashion, so it reached straight across the Missouri River to the north and annexed 20 square miles of the next county. Now Kansas City covers 82 square miles, being one third larger than its rival, St. Louis, which, however, still has almost twice as many people.

Kansas City thus has plenty of room to grow in. So, too, have nearly all the towns and cities of the Missouri basin. They have only to spread out over the prairies and plains or up onto the next series of benches. This fact points up one of the most dominant impressions of many of these urban communities of the great valley—their roominess. Their streets were not laid out by wandering cows, nor platted by dollar-hungry subdividers. They are wide and straight and inviting, a planner's dream. But it is a long

way between towns—a long, empty way in many sections.

Take out those fifty-two larger cities and towns, and you will have left an average of less than ten persons per square mile for the entire basin. If you want to feel really lonely, take away the four larger towns of Wyoming and there will remain in that state just about two persons per square mile, scattered over a wild, rugged terrain bigger than Pennsylvania and New York combined.

CHAPTER VII

As to "Indians Not Taxed"

SEVENTY thousand of the people in the Missouri River watershed are Indians. They live on twenty reservations. To a lamentable extent they are a dependent race, not wealthy like their cousins in oil-rich Oklahoma. Descendants of tribes that once ruled the Great Plains and held the white man at bay, they are relegated to getting along as virtual dependents of the federal government. As a rule, they are not farmers, but they have shown aptitude for raising livestock on their grazing lands. Some of them are glad to lease their holdings to white grazers and to live on the rent. Their simple dwellings are congregated chiefly in the bottomlands of the rivers, where the soil is better for their gardens and crops and where there is some shelter. These valley dwelling-places have become endeared to them, not only as home, but also as the burying-grounds of their forebears. Now a great many of these Indians are confronted with the necessity of moving, and perhaps of altering their whole way of life, because their homes are on the sites of a number of the big reservoirs to be filled with impounded water when the great new dams are built.

Indians were living in the forests of the eastern part of the Missouri basin and along some of the streams in the plains in the time of Columbus. They were hunters, but some of them in the Dakotas planted corn, squash, and

beans. Pressure of the white man in his developing New World, plus the lure of fresh hunting-grounds, moved tribe after tribe into this vast, pristine valley from the east, west, and north. The bison, or American buffalo, was the great game animal. It furnished food, robes, and the material for tepees and storage boxes. It made nomads of the Indians, who followed the bison herds.

The general occupation of the Missouri basin by the numerous Indian tribes is of relatively recent origin, for many of the tribes moved onto the plains only about three hundred years ago. Indeed, as has been noted in a historical account by the federal Bureau of Indian Affairs: "When the white men first traveled up the Missouri River and met the Indians, the Indians were still finding better ways of living with Mother Nature in their new home." At that point in time the Indians of this region became a problem for the white men and the federal government—a bitter, puzzling problem that is still with us. For almost one hundred years the nation has segregated most of these Indians on reservations, in a world apart. This has been a costly and highly unsatisfactory solution. The reservations have valuable potential mineral resources that need development; meanwhile the income of the Indians is precarious, and they have not learned self-reliance. It is possible that the projects for dams and reservoirs may be of real service in forcing a long step toward assimilation of the Indians into normal society.

The Bureau of Indian Affairs, or Indian Service, an agency of the Department of the Interior, has been shaping its efforts of late toward making the Indian independent. It wants to help him to stand on his own feet and to

end what amounts to governmental guardianship. Officials are of the opinion that they may be aided in this by the effect of the relocations and readjustments necessitated by the vacating of the reservoir sites. They are hopeful also that any increase of industrialization in the region would give new work opportunities to Indians. Apparently they will be satisfied if the next generation reflects a good start in the readjustment process.

Dealings with the Indian tribes have continued to be through the "agencies" set up on the reservations, themselves self-contained or segregated rural communities. Such a system is hardly in keeping with modern democratic views. It represents what someone has called "barnacles of outmoded habits." The Fort Berthold Indian Agency at Elbowoods, North Dakota, will be flooded out by Garrison Dam; the central agency at Cheyenne River Reservation, in South Dakota, will be inundated by Oahe Dam. Fort Randall and Big Bend dams, on the Missouri in South Dakota, and eight reservoir and irrigation projects of the Bureau of Reclamation also will affect Indian lands and lives. Of these, the Fort Randall work is actively under way, and one big undertaking of the bureau, Boysen Dam, on the Big Horn River in Wyoming, is nearing completion. About seven hundred Indian families, or several thousand persons, must be moved away from the sites. Federal officials fear that these families will seek to resettle on other reservation lands already overpopulated. The officials, however, regard this enforced removal from the reservoir areas as a challenging opportunity to make a fresh start with a large group of Indians. How well the challenge will be met remains to be determined.

Another basic aspect of the complex Indian problem concerns the utilization of irrigation water on Indian reservation lands. Can the Indians as a group become good irrigation farmers and handle the water properly? They have had relatively little experience with irrigation farming, a painstaking specialty. It requires constant effort and planning by the farmer and the use of efficient methods. All this is contrary to the experience and inclination of the Indians. As a whole, they have not been good farmers, wet or dry. In the Dakotas, where the greater part of the Indian lands are located, they have had virtually no experience with irrigation. By the time the Pick-Sloan plan was adopted, the Bureau of Indian Affairs had developed irrigation for 187,000 acres, or a small fraction of the Indian lands in the basin, and had proposals pending for irrigating 193,000 additional acres. The Pick-Sloan program proposed to irrigate 216,000 acres of Indian land, largely including districts where the bureau had made its plans.

The relocation problem first arose about 1945, when plans for Garrison Dam were initiated. Repeated powwows took place between the Fort Berthold Tribal Council and representatives of the Army Engineers and the Bureau of Indian Affairs. Sometimes, however, when the white officials wanted to talk, the Indians did not, and absented themselves. General Pick himself journeyed by car to Elbowoods and engaged in negotiations, accompanied by sundry subordinate officers and civilian aids. On other occasions colonels or lieutenant colonels made the dusty trip. The Indian representatives composing the Tribal Council usually appeared in full feathered and beaded regalia. The discussion sometimes was carried on in the Indian tongues

on one side of the table and in English on the other, a time-killing device, for it required tedious interpretations. The negotiations did not stop at that level. The Indians retained a smart lawyer at Washington. They aroused support from powerful political quarters. Senator O'Mahoney of Wyoming at one time championed them in support of certain legislation on the relocation question. The Interagency committee urged officially that a solution be found. Congress required at first, and for some time, that the Department of the Interior find and provide lands of equal quantity and quality to replace those in the Garrison Reservoir site. That proved to be a virtually impossible assignment. Eventually, in the autumn of 1949, Congress passed an appropriation exceeding $12,000,000 for outright cash reimbursement of the Indians. This solved the immediate problem of building the reservoir.

In the course of the congressional developments Governor Aandahl of North Dakota appeared before a House subcommittee to argue for funds for Garrison Dam work and for paying the Indians in cash. His testimony disclosed the extent to which Indian lands of the Fort Berthold Reservation were leased to white operators. He listed the relative acreages as follows:

USE	INDIANS	WHITES
Cropland	2,696	57,856
Hay fields	19,080	1,737
Grazing land	215,834	282,655
TOTALS	237,610	342,248

In contrast with the foregoing figures, about 160,000 acres of reservation land were needed for the reservoir. The Governor pointed out that this amounted to less than one

half of the acreage leased to white operators. He added: "It is true that the bottomland to be inundated is the timber land, the better hay land, and the pleasant area in which the Indians like to dwell. The reservoir, however, will offer advantages in sport and recreation and economic value that do not now exist."

Among the desirable features of the river bottoms as homes for the Indians, at Garrison and elsewhere, are the availability of timber for home-building and for fuel and fence posts; easy access to water supplies; handiness to fish and wildlife whose natural habitat is in the lowlands; and the presence of wild fruit.

On Fort Berthold Reservation there have been about 1,800 Indians, comprising what is known as the Three Affiliated Tribes. These are the Gros Ventre, a group reputed to have shown great leadership in the Indian-warfare days; the Arikara, sometimes locally called the Rees; and the Mandan, perhaps the most agriculturally inclined of the three tribes. This reservation, somewhat less than average size, covers 643,368 acres. The Indians own some of this land outright, some is known as tribal land, and some is allotted in trust.

The Sioux, concentrated largely in South Dakota, are the most numerous of the tribes. About one fifth of the area of South Dakota is devoted to Sioux reservations, whose aggregate area is somewhat larger than that of Massachusetts and New Jersey combined.

The area of Indian lands in six states of the basin, amounting to somewhat more than 21,700,000 acres, or almost 34,000 square miles, slightly exceeds the area of Maine. In round figures, it is divided thus:

STATE	ACRES
South Dakota	10,500,000
Montana	7,164,000
Wyoming	2,268,000
North Dakota	1,226,000
Nebraska	583,000
Kansas	1,000

The reservations and institutions, and the tribes, are divided by states as follows:

RESERVATIONS	TRIBES
South Dakota	
Cheyenne River	Sioux
Lower Brule	"
Crow Creek	"
Yankton	"
Pine Ridge	"
Rosebud	"
Standing Rock	"
Flandreau School	
Sioux Sanitarium	
Pierre School	
Montana	
Blackfeet	Blackfeet
Rocky Boys	Chippewa Cree
Fort Belknap	Assinboine Gros Ventre
Fort Peck	Sioux Assinboine
Crow	Crow
Tongue River	Cheyenne
Wyoming	
Wind River	Arapaho Shoshone

North Dakota	
Fort Berthold	Gros Ventre, Arikara, Mandan
Fort Totten	Sioux
Standing Rock	Sioux
Nebraska	
Ponca	Ponca
Santee	Sioux
Winnebago	Winnebago
Omaha	Omaha
Kansas	
Haskell Institute	

You can travel about the Indian districts a good deal without seeing much of the Indians. They keep to themselves. When seen in the towns on shopping expeditions, some of them present a rather pitiful appearance: stolid, dispirited, poorly attired, and occasionally sick-looking folk. Of course that is not the universal status of these people, but it is undeniably a valid external impression.

To many persons, perhaps the most familiar Indians of the region are the Blackfeet. For years a band of handsome Blackfeet, wearing strikingly rich buckskin costumes with traditional embellishment, has met the trains and entertained hotel guests at Glacier National Park, in Montana. Many of their strong faces have been depicted in color on the calendars of the Great Northern Railway. Travelers on the Northern Pacific also have often been greeted by a group of Mandans performing dances on the station platform at Mandan, North Dakota.

It is interesting to note that the United States Constitution mentions Indians in two places. The clause covering

enumeration of the people for purposes of dividing membership of the House of Representatives among the states excludes "Indians not taxed." This has a bearing, admittedly minor, on the count for some of the Missouri basin states. The "commerce clause" of the Constitution states in a few words one of the most important powers of the federal government: "To regulate commerce with foreign nations and among the several states and with the Indian tribes." The last point has been a major source of federal power over Indians. Under this and other authority the Bureau of Indian Affairs has a big job cut out for it: to meet the challenge of assimilating the descendants of the valley's first historic residents. If the task is handled successfully, the result might go down in history as a remarkable development in mass sociology and practical human relations.

CHAPTER VIII

Radio Challenges the Fourth Estate

An important factor in the progress and welfare of any region is the caliber of its daily press. For the Missouri basin as a whole the newspapers are not strong. Fortunately, they are generally free of improper outside pressures and influences. In most of the cities, however, the papers do not have enough circulation or enough advertising revenue to do a first-rate job of giving the news of the world, of the nation, or even sometimes of their own states or neighborhoods. This can be said of the press in various other sections of the country, but the condition is aggravated in the Missouri Valley by the relatively slim population in the spheres of urban influence and, between cities, the yawning spaces where few papers are sold.

Meanwhile a newer means of communication, the radio, appears to thrive in this region. It reaches where the press cannot. The newest means, television, plays a very small part here so far.

Opinions of a great many residents of the valley clearly are influenced by what they hear on the radio. For those who read the papers, the syndicated columnists doubtless play a part in shaping opinions. Few of the papers have strong editorial pages capable of waging vigorous fights, and few of them engage in persistent campaigns in their news columns to right wrongs of any great importance.

In the 52 basin cities of 10,000 population or more, there are 66 daily newspapers, morning or evening, and 30 Sunday papers. The circulation of the daily newspapers as shown by a standard reference guide is about 2,184,000. On its face, the figure seems good, the population of these cities being about 2,461,700; but several of the more important papers included have large rural distribution, so that the number of readers in many other urban communities would seem to be unusually small.

What is more surprising is that the Sunday circulation is reported in the same guide as only about 1,657,000. America's cities elsewhere are accustomed to fat Sunday newspapers, full of solid information and of entertainment, which usually represent by far the largest circulation of the week. In this region the Sunday additive often consists of nothing more substantial than some "comic" strips, light magazine features, and local society reports. An editor from Minneapolis, 180 miles away from the basin, is authority for the statement that the biggest Sunday-paper circulation in North Dakota or South Dakota is that of the *Minneapolis Sunday Tribune*, one of the organs of the Cowles family. The *Tribune* has a regional interest in those states, but its point of view cannot be expected to be the desirable one of a home-town champion and informer for little basin cities.

One of the bad elements of the situation is that only seven cities in the whole basin have an opposition press. These are Denver; Great Falls, Montana; Independence, Missouri; Columbia, Missouri; Casper, Wyoming; St. Charles, Missouri; and Beatrice, Nebraska. The opposition papers in Great Falls, Independence, and Casper have

small circulation, and the one in Casper is a tabloid. Columbia's "second" paper is published by the state university's journalism school for general public reading as well as for the campus. The papers in St. Charles and Independence have to compete with big city journals.

The only cities of the region with newspapers of full metropolitan caliber are Kansas City, Denver, and Omaha.

Kansas City has the *Star* and its morning edition, the *Times*. These are sold to subscribers as a package, with combined circulation, according to a reference guide, of about 711,000. When people say "the *K. C. Star*" they commonly mean to include the *Times*, as publication really is an around-the-clock operation. The morning and evening editions are staffed separately, but a reporter on an out-of-town assignment for the *Star* is expected to file dispatches for the *Times* also. The usual policy is to carry a news article in either the morning or the evening edition, but not both, unless there is a new development. The theory of this is that many readers see both papers and do not care for repetition. The *Star* does a good job of going after a story when it wants to, and it keeps the city well informed on local and state governmental proceedings, but it cannot be classed as a crusader. Its editorial policies are conservative and Republican, and its news pages reflect this conservatism. Its headlines and make-up, particularly on page one, have a heavy, old-fashioned touch. On page three, where some papers display interesting news of secondary importance, the *Star* may place a syndicated column or an article reprinted from a periodical, along with a large space devoted to advertising. The *Star* is owned by some of its employees. The boss is Roy Roberts, who was the paper's

able Washington correspondent three decades ago and later its managing editor. He has a special interest in politics. In his regime the paper has paid particular attention to Kansas, where it has considerable influence and circulation, and where the usual Republican victories must be pleasing to Mr. Roberts. Missouri's administration has been Democratic for a long time, but the *Star's* political reporters follow affairs of the whole state with unusual fidelity. Since the end of the vicious control of Kansas City and Jackson County by the machine of the late Boss Tom Pendergast, Kansas City has enjoyed a nonpartisan city government of reform character with some Republican tinge. The *Star* has shown diligence on occasion in exposing local vote frauds. The rotund Mr. Roberts has become a political oracle, customarily visited by roving correspondents who wish to feel the pulse of the Missouri-Kansas section.

The *Denver Post* is one of the nation's gaudiest and most sensational newspapers. It claims pre-eminence and a special interest in its "Rocky Mountain Empire," which, by its definition, takes in a large part of the Missouri basin and a big slice south thereof. For many years it was owned by the colorful Frederick G. Bonfils and Harry H. Tammen. It is still controlled by the former's daughter, Helen Bonfils. While it has toned down from its lusty old days, it remains an excitable and exciting sheet, a mélange of bizarre headlines. In recent years it has been under the management of Palmer Hoyt, who came out of the Northwest. He put some new life into both the business side and the journalistic content. One advance attributed to him by newspaper men is in the direction of greater fairness and

objectivity in reporting news, including specifically greater fairness in political news. There never is any doubt about what the *Post* is for—or against. It has devoted considerable attention to the Communists, for instance; it is against them. The *Post* is an evening paper, with a big, entertaining Sunday morning edition that is scattered to the corners of the paper's "empire." The other Denver paper, a morning tabloid, is the *Rocky Mountain News*, a unit of the Scripps-Howard chain, with the same impersonal editorial tone found in the rest of that chain from New York to San Francisco, but with a distinctive local flavor. It gives the *Post* aggressive competition. The listed week-day circulations are 222,000 for the *Post*, 123,000 for the *News*.

Omaha has the *World-Herald*, published by Henry Doorly, with circulation reported as 239,000. This paper has both morning and evening editions. A reader from another city often is surprised to find that the language of many articles in both editions is identical, for the staff frequently does not trouble to find or write either a new "lead" or a revised article. This practice is the direct opposite of that of Kansas City's morning and evening papers. The *World-Herald* is highly conservative in editorial policy, and ranges from suspicious to critical of anything it feels to smack of socialism or the New Deal. It treats all of Nebraska as its field of news and often sends staff reporters across the state on assignment. Soil conservation has been a matter of special concern to this paper, as a result of the important agricultural surroundings of Omaha. It has won several awards for vigorous support of soil conservation.

The *World-Herald* has had a changing character over the years. In its early days it was regarded as an agrarian-

radical journal. Then it became a liberal Democratic organ when published by Senator Gilbert M. Hitchcock, floor leader of the League of Nations fight for President Wilson. William Jennings Bryan was attending the Democratic national convention of 1896 as a reporter for the *World-Herald* when he abandoned his journalistic position and made the famous "Cross of Gold" speech that won him the presidential nomination. Mr. Doorly, born in the Bahamas of English parentage, went to Omaha as a youth and started on the paper with an undistinguished job in the business office. He rose to the post of business manager, married the daughter of the boss, Miss Margaret Hitchcock, and eventually became head of the paper. In 1932 the *World-Herald* supported Franklin D. Roosevelt for President; Senator Hitchcock died in 1934; in 1936 the paper was for Alf Landon, Kansas Republican, for President, and it has been conservative Republican ever since. When the issue of public electric power became sharp in Nebraska, now the nation's only all-public-power state, the *World-Herald* seemed to vacillate for a time, but finally came out in favor of the public system. The paper is inclined to pick a "safe" or non-controversial issue, such as scrap collection, when it chooses to make a campaign.

At Lincoln, Nebraska's capital, the *Nebraska State Journal* (morning and evening) and the *Lincoln Star* (evening), and their Sunday combination, the *Journal-Star*, are under a single corporate ownership. The *Journal* and the *Star* are edited separately, however. The *Journal* and its youthful editor, Raymond A. McConnell, Jr. won the Pulitzer Prize for distinctive and meritorious journalistic service in 1948. This was for forcing all conceivable potential

candidates for the Presidency onto Nebraska's unique preferential primary ballot, with the result that the serious contenders were forced to present themselves in person to the voters of Nebraska. In 1951 the law was changed, however, to permit voting only on presidential candidates who consent to this in writing. Some newspaper men say that Burt James, then the statehouse reporter for the *Journal* and now the managing editor of another Nebraska paper, the *Hastings Tribune*, also had an important part in making the preferential primary a success. The *Journal* took on new life in recent years under Mr. McConnell's editorship. The editor of the *Star*, James E. Lawrence, also is an able newspaper man, with a long record as a liberal. He was a political lieutenant of the late Senator Norris.

The *Mitchell Daily Republic* is worthy of notice as a lively small paper in a small city. Published in a South Dakota town of only about 12,000 population, it has the remarkable circulation of about 16,000, for it is distributed intensively in the surrounding countryside. It has taken an openly critical stand on some aspects of the Interagency plan of basin development, and looked with favor on formation of a new group of conservationists who have questioned some Interagency ideas. Moreover, it has done something few other papers in the whole country have undertaken to do: it has attacked, with rather good understanding of the complicated factors involved, the rising service rates of the Bell telephone system.

In Montana the *Great Falls Tribune*, with circulation of about 29,000, is the outstanding paper. Its publisher, until his recent death, was the elderly, dignified O. S. Warden, an Associated Press director, Democratic na-

tional committeeman, and reclamation leader. The *Tribune* is rather thorough in giving the news of Montana, carrying many news items that do not find their way into other papers of the state. Clearly it is independent, but it does not pack any great wallop. The other paper, the *Great Falls Leader*, has circulation of only about 6,200.

The charge, or complaint, often has been made that some of the other principal daily papers of Montana are controlled by the state's big industry, Anaconda Copper Mining Company. Usually the assertion has been uttered without offer of proof. I wrote to C. F. Kelley, chairman of the board of ACM, asking for the facts. The reply, confirming the charge, came to me from Roy H. Glover, of Butte, Montana, Western general counsel for ACM and president of the Fairmont Corporation, whose stock, except for directors' qualifying shares, is owned by ACM. The Fairmont Corporation, Mr. Glover stated, "owns either the majority or all of the stock of companies publishing certain daily newspapers in Montana." He listed these papers as follows:

BILLINGS: the *Billings Gazette* (morning and afternoon).
HELENA: the *Independent Record* (afternoon).
LIVINGSTON: the *Livingston Enterprise* (morning).
BUTTE: the *Montana Standard* (morning).
the *Butte Daily Post* (afternoon).
MISSOULA: the *Missoulian* (morning).
the *Sentinel* (afternoon).

Billings, Helena (the capital), and Livingston are in the Missouri basin; Butte and Missoula are in the Columbia basin. These five cities and their suburbs have at least one fifth of the population of all Montana. Butte, Billings, and Missoula are the largest cities in the state except for

Great Falls. Here is the spectacle of one great industrial corporation, with a big economic stake in the commonwealth, holding ownership of major channels of public information and opinion. Both the temptation and the moral inherent in this situation seem obvious. The case was stated recently by a Helena liberal weekly, the *People's Voice:* "Except for the two Great Falls papers, the ACM company owns all the major daily papers of Montana and can publish or suppress the facts, as it pleases, which are of concern to the citizens of the state. It enjoys economic power over the wellsprings of public opinion." I have heard politicians complain that only candidates or causes acceptable to ACM can get into the news columns of these "company papers." I have heard liberals complain that only the conservative or "big business" side of public issues can command notice in these publications. Occasional inspection of these papers tends to confirm these complaints; they smack of a kept press.

St. Louis, just outside the Missouri basin, was blessed until June 15, 1951 with three strong, independent newspapers, the morning *Globe-Democrat,* the afternoon *Star-Times,* and the afternoon and Sunday-morning *Post-Dispatch.* Rising costs of publication proved too much for the *Star-Times,* which ceased publishing and sold its assets to the *Post-Dispatch.* The *Star-Times* had been a relatively enterprising and liberal journal. Like the *Globe-Democrat,* it had been unusually good as compared with the dailies of many American cities. The fearless, crusading, liberal, and highly successful *Post-Dispatch,* where I have worked for over 33 years, has enjoyed frequent acclaim as one of the great journals of the nation and the world. By a news

and editorial crusade in the early 1940's the *Post-Dispatch* played a large part in bringing action on the Missouri River development to a head. It has failed so far, however, to gain its leading objective of the crusade: establishment of a Missouri Valley Authority, or MVA. Meanwhile, it has continued to be the most articulate and vigorous proponent of that cause, printing many more news and analytical articles about the river and the basin than any other publication. It was founded by Joseph Pulitzer, Sr., who later published the old *New York World*. His son and namesake has been the active editor and publisher of the *Post-Dispatch* for many years. A third Joseph Pulitzer, grandson of the founder, is vice-president of the corporation. The *Star-Times* editorially espoused an MVA also, but in somewhat half-hearted fashion. It largely ignored the basin in its news columns. The conservative *Globe-Democrat* is bitterly against MVA and pro-Pick-Sloan on its editorial page, but has paid limited attention to the basin in its news columns. Circulation of the St. Louis papers within the basin is confined to eastern Missouri.

Also published outside the valley, but with strong influence in its Iowa portion, are the *Des Moines Register* (morning) and *Tribune* (evening), which are Cowles papers. They have paid relatively little attention to the basin-development program, even when Iowa's Governor has journeyed from Des Moines to participate in river meetings.

The basin-development program, and the controversies inevitably attached to it, are the biggest news story in the region, a story that has been taking shape since the early 1940's and will continue for many years. Coverage of this

story is one test of the press. The *Kansas City Star* has been consistent in spot coverage, with a staff man nearly always present for key meetings and events. It is not inclined, however, to challenge or look behind official actions or to dig into the significance of moves and events. The *Denver Post* has rarely covered the basin meetings, and when it has, the result has usually been superficial. The *Rocky Mountain News* has been even less interested. The *Omaha World-Herald* has covered most river affairs with staff men and has gone after some stories on its own. Missouri River headquarters of the Army Engineers are in Omaha, and this paper is on the most friendly terms with the Engineers. Both the *World-Herald* and the *Kansas City Star* are strongly in favor, editorially, of the existing Interagency plan and administration, and opposed to an MVA. A small but loud editorial voice joining them, especially in the early stages of Pick-Sloan, has been that of W. F. Flinn, publisher of Montana's *Miles City Star*.

It is ironic that the most intensive news coverage and analysis of basin development have come from two papers beyond the basin: the *St. Louis Post-Dispatch* and the *New York Times*. The former has been the more active, while the *Times* has supplied extensive and penetrating reports from William Blair, its regional staff correspondent stationed at St. Louis. Occasionally such outside papers as the *Minneapolis Star* and the *New York Herald Tribune*, and various weekly or monthly magazines, have undertaken to cover the story of the basin by sending a writer out on a hasty survey. *Fortune* did a rather intensive study, sending Robert Shaplen and a research assistant. Even a skilled reporter, however, simply cannot grasp the whole picture in

one trip; it is too big and complicated. The Associated Press tried the same thing, under pressure from editors of AP-served papers, but the main result was a typical one-shot "roundup" story. The AP does send its South Dakota bureau chief, Harold S. Milner, to Interagency meetings for South Dakota "angles" as a result of demands from editors. The AP and its rival, the United Press, generally cover river meetings by local staff men, who unfortunately cannot be expected to be well versed in the intricacies and nuances of the complex program. The Hearst International News Service has shown virtually no interest in the basin.

From time to time, editors or publishers of papers of some of the smaller cities of the basin have attended Interagency metings. Among such men who have shown sincere understanding of basin affairs are Robert B. Hipple of the *Pierre Capital Journal*, John O. Hjelle of the *Bismarck Tribune*, Mr. Lawrence and Mr. McConnell of the Lincoln papers, W. Harrison Brewer of the *Casper Tribune-Herald*, E. M. Brady of the *Mitchell Daily Republic*, and Fred C. Christopherson of the *Sioux Falls Daily Argus-Leader*. Mr. Hipple has appeared sometimes in a dual capacity, as he is a member of the Missouri River States Committee. Roscoe Fleming, a free-lance liberal journalist at Denver, has written a great deal about basin matters, even occasionally placing an article in the *Denver Post*.

In recent years the *Kansas City Star* usually has sent youthful Karl L. Peterson, Jr., to report Interagency committee meetings. With his employer's knowledge, he accepted a private job for pay, writing a pamphlet descriptive of the Interagency plan, in behalf of the committee, an extra-official public body. It was arranged to compensate

him from funds of the governors' Missouri River States Committee. Thus he found himself in the pay of public officials whose activities he was assigned to report for his paper, but neither he nor the Interagency members felt that there was anything improper about this. The Interagency committee retained him because it wanted a trained, non-technical writer, familiar with its undertakings, who could tell the story in an interesting style.

Frequently the basin reporter for the *Omaha World-Herald* has been Max Coffey, a quiet, hard-working veteran. Mr. Coffey telegraphed in for the front page of his paper one of the most remarkable news reports to come out of the development program. He was relating how one member of the Missouri River States Committee, by the working of the unanimous consent rule, prevented adoption of demands for more federal appropriations for the Interagency work at a time when Washington was stressing economy. Mr. Coffey's article, datelined Lincoln, Nebraska, November 16, 1946, started this way: "If the people who want the Missouri basin developed under the Pick-Sloan plan are to succeed, they may have to secede from the state of Missouri or divert the Missouri River around that state. The governor of Missouri, Phil Donnelly, Friday blocked efforts of the other Missouri basin governors to pass a resolution asking that money be made available for orderly construction of the Pick-Sloan plan."

Limitation of news space, and of funds available for news, plays a large part in the restricted information on local, state, national, and world affairs offered readers of the press in many parts of the basin. The papers have the benefit of the nation-wide press wire services, and some-

times of special news services, but their editors are forced to choose only a small fraction of the daily news report for publication. Most of the papers have such small news staffs of their own that they rarely can spare men to cover matters of important local interest occurring elsewhere; nor do they feel they can afford the expense of such trips. Often they are content to use verbatim—and without credit—the hurried reports of harassed Associated Press or United Press state bureau men, who usually have more work to do than they can handle properly. The wonder often is that, with the financial means at hand, the papers accomplish as good a job as they do. Many of them have excellent plants, in handsome buildings, with good mechanical equipment. They usually do job printing, which frequently is the life-saver of the business.

Editorial comment and opinion are restricted in many of the papers. Editors or publishers usually have to concern themselves with getting out the news, and sometimes with business-office matters, so that time and energy for writing thought-provoking or militant editorials are limited. The press is more free of restrictive pressure from local business interests than in the past, yet it is unusual to find editorial declarations that stray far from the accepted pattern of community thought as fostered by a town's dominant interests. Sir Galahad of the press is no Don Quixote; he does not wax too hotheaded if his lance is likely to shear out the advertisements of a big merchant, income that may spell the difference between profit and loss for his paper. By and large, the press of this region has a limited outlook. It is willing to accept the actions and views of public servants without challenge. It seems to have little stomach for delv-

ing deep for facts in complicated, broad, or controversial issues. Nevertheless, many able, intelligent, conscientious publishers, editors, and staff men serve many of the papers of both the larger and the smaller cities of the basin.

On the other hand, radio in the Missouri Valley is subject to the same criticisms and limitations that affect it nationally—but in this region it has the tremendous advantage of being able to reach its audience where the press cannot. A notable illustration is in the field of politics: campaigning by radio can be particularly effective in its direct appeals to a thin and scattered electorate. A rancher many miles from town on a rough trail can tune the radio at home or in his car or plane to news broadcasts, speeches, advertising, and, of special interest to him, the latest market quotations on livestock or farm products.

There are perhaps 120 radio broadcasting stations in the Missouri basin. The number may seem small, but is actually large in proportion to the number of towns of fair size. Concentrations of stations in Kansas City, Denver, Omaha, and St. Louis offer a wide variety of programs. Most other centers have only a single radio station or, at the most, two stations. These are strategically located, and the potential radio audience in the region doubtless comes close to equaling the entire population. Only the most remote ranches and mountain cabins are out of effective reach of the ether waves. Some of the stations are in towns of small population, where the appeal obviously must be to a wide radius of hinterland, and where surely the advertising revenue must be modest. The obvious explanation of their existence is that once you set up your broadcasting

equipment, the operating costs of such a plant cannot be very large.

Nebraska has 24 radio stations listed in a standard guide —five in Omaha, three in Lincoln, and 16 in 14 smaller cities. South Dakota has 14; North Dakota has six, not counting several in cities beyond the basin border. Wyoming has 13, Montana about 20. Most of the stations are essentially local institutions with localized programs. Their music may come from records or from home talent. They devote considerable attention to news, derived mainly from condensations of the AP and UP wire services, but also drawn from local sources. As might be expected, they place a heavy emphasis on agriculture and related matters. An important service is the announcement of weather conditions and forecasts and of changing crop and livestock prices. Frequently the international news broadcast in this region is sketchy and the national news somewhat limited. Many of the stations make considerable use of wire recorders to pick up public ceremonies or agricultural demonstrations for later broadcast. This facilitates program arrangement and also avoids the expense of land-wire connections for direct broadcast from the scene of action, assuming that the scene is reachable by wires. It is noticeable that little enterprise has been shown by radio in presenting such a locally and regionally important event as an Interagency meeting. One explanation may be that this would cut into too much salable time. The alternative device, however, of short broadcast interviews with leaders of Interagency is frequently used. Radio in this region, as elsewhere, suffers from its necessary condensation of news, and

from the inability of the ear to distinguish as well as the eye between fact and opinion, or to grasp the source of news.

Location of stations in three of the big national radio networks is confined chiefly to the larger centers. These chains, the National Broadcasting Company (NBC), the Columbia Broadcasting System (CBS), and the American Broadcasting Company (ABC), have 32 station outlets in 23 cities. ABC leads with 13, NBC has 10, and CBS nine, as listed in a standard reference work. Their locations are given in the following table, with the cities listed in descending order of size:

CITY	*NBC*	*CBS*	*ABC*
Kansas City, Missouri	x	x	x
Denver, Colorado	x	x	x
Omaha, Nebraska	x	x	x
Lincoln, Nebraska			x
Sioux City, Iowa		x	
Topeka, Kansas		x	x
Sioux Falls, South Dakota	x		
Great Falls, Montana	x	x	x
Cheyenne, Wyoming			x
Columbia, Missouri			x
Billings, Montana	x		
Rapid City, South Dakota		x	
Casper, Wyoming			x
Grand Island, Nebraska			x
Bismarck, North Dakota	x		
Helena, Montana	x		
North Platte, Nebraska	x		
Scottsbluff, Nebraska		x	
Bozeman, Montana	x		
Jamestown, North Dakota		x	

Yankton, South Dakota	x
Rawlins, Wyoming	x
Shenandoah, Iowa	x

In contrast, the Mutual Broadcasting System (MBS) is listed with 38 stations in the basin. Another network, not widely known nationally, is the Keystone Broadcasting System, with 31 stations in all parts of the basin. It operates with transcriptions only, not using land-wire hookups. It is interesting and perhaps significant to find in this valley at least seven regional radio networks. These picturesquely named setups include the Z-Bar-Net in Montana; the Golden Pheasant Network in four South Dakota cities; and parts of these others: Columbine (Colorado), Great Northern (North Dakota and Sidney, Montana), Intermountain (Montana and Wyoming), Iowa Tall Corn (represented at Sioux City), and Rocky Mountain (Montana and Wyoming). Only 25 radio stations in the basin, mainly in the larger cities, have tie-ups with newspaper ownership. Thus the radio and the press are predominantly independent of each other, a fact that seems significant in this regional challenge by radio to the press.

That latest boon of communications, the Bell telephone system's coaxial cable, the *sine qua non* of a television network, has not penetrated far into the Missouri Valley. Only a few spots in the valley have been able to see the televised maneuvers of the Russian bear at the United Nations or the allegedly whimsical antics of a make-believe dragon in a Chicago studio, the Kefauver senatorial investigation of gambling and crime at St. Louis and New York, or the stirring speeches in the Truman-MacArthur controversy. Kansas City has one television station, WDAF-

TV, owned by the *Kansas City Star*. Omaha has two, KMTV and WOW-TV. Reaching a little way into the basin is KSD-TV of the *St. Louis Post-Dispatch*. Early in 1951 it was estimated that there were 389,000 television receiving sets in and near Kansas City, Omaha, and St. Louis. The spread of this new medium has been fantastically rapid, and within a few months after that estimate the number no doubt was appreciably higher—but there were no additional stations to serve other parts of the region. However, who can say that the day may not come soon when symphony concerts, presidential inaugurations, and *Howdy Doody* will be televised throughout the length and breadth of the Missouri Valley?

CHAPTER IX

From White-faced Cattle to Uranium

In wheat and certain other crops, and in cattle, sheep, and hogs, the Missouri basin cuts a big figure in the nation. Its share of the national production of all these commodities is appreciably larger than its geographical proportion of the country, vastly larger than its proportion of the human population. On the other hand, it has a low level of industrial production. Given assured supplies of water and of greatly increased electric power, this region could press into the field of industry on a much larger scale. The current valley-development program is intended to provide the water, but whether it will give sufficient assurance of supply remains to be seen. It is also adding greatly to the hydroelectric generating capacity, but there is some doubt that the program goes far enough in that respect. Concern is felt over whether the necessary steam-generating plants will be built to assure a "firm" or steady supply of electricity. If the region obtains such needed facilities, it could offer various advantages as a place for decentralizing vital industries for the sake of national security. Of great interest also are the huge, varied mineral resources of the basin, which have remained unexploited to a surprising extent.

The region is relatively new as a place for farming. It remained largely a grazing land for cattle until almost the end of the nineteenth century. The new settlers, by and

large, did not make the best use of the land. They tried to grow crops for which it was not suitable; they overgrazed the grass and failed to conserve the soil; they wasted the forests. Only in comparatively recent times has the movement to overcome all this gained any real momentum. Irrigation in the Missouri Valley is only about forty-five years old and has not become extensive. Agriculture there is not yet fully developed. Nevertheless, the basin produces slightly more than one third of the nation's wheat, about one quarter of its corn and oats, slightly more than one third of its sugar beets, about 40 per cent of its barley and rye, and more than 45 per cent of its flax. In spite of this leadership in certain crops, the valley produces only about 14 per cent, or not quite one seventh, of the nation's crops of all kinds. This contrasts with the fact that the valley has about one quarter of the nation's cropland. The reason for this disparity between area and yield obviously is to be found in the characteristics of climate, soil, and facilities. Droughts and floods are likely to recur, in spite of the best efforts of man. The view of government officials is that such disasters cannot be predicted or prevented, but that the proposed agricultural program and some measures already in effect can reduce their ravages.

Farm and grazing land of the region is owned or operated by 582,000 farmers and ranchers. The land they use measures about 282,000,000 acres, or 440,600 square miles; it covers 83 per cent of the basin. Federal officials estimate that the Interagency plans for irrigation and flood control will have direct effects on between 50,000 and 60,000 of the farm families. Readjustments of the place or way of life, or changes in the type of farming are expected to be spread

over a long period, so they can be carried out in an orderly manner. Gladwin E. Young, a leader of Interagency, the Department of Agriculture's field representative in the basin, is of the opinion that any increase in rural population that will come from additional irrigation in the region will be offset, or more than offset, by the continuing trend to larger farms, which involves a decline in the number of farms and the number of farm families.

On the other hand, Mr. Young estimates that the agricultural program for the basin, if adopted, will increase farm production about 40 per cent by 1980—28 per cent from improved land use and conservation, and 12 per cent from new irrigation. The Bureau of Agricultural Economics estimates that the nation's population will increase by almost 40,000,000 by 1980, to a total of 190,000,000. That means a rise of about 26 per cent in the number of American mouths to feed, to say nothing of the demands for food which may come from other parts of the world. The farms and ranches of the basin are in relatively good position now to face the growing need for their products. They are manned by people with the know-how for the job, equipped with modern machinery, well stocked with food animals, and at present are generally in good shape financially.

A crop of considerable importance in certain portions of the region is timber. The Forest Service estimates that the annual cut is between 180,000,000 and 200,000,000 board feet, or the equivalent of enough lumber to build from 18,000 to 20,000 five-room houses. Actual uses of this timber are of rather specialized character. Saw timber, railroad ties, paper pulp, posts, poles, and piling come from the trees of the main forests, which are in the Rocky Moun-

tains. These trees include ponderosa pine, lodgepole pine, Douglas fir, and Engelmann spruce. Available timber in the lower basin, mainly in Missouri, consists of oak, elm, hickory, a little remaining black walnut, and some other hardwoods. Some of the oak is used for flooring and some for making whisky barrels; the other woods go for veneering, tool handles, boxes, barrel staves, and railroad ties.

About one fifth of the nation's livestock and livestock products comes from this basin. This volume is somewhat large in relation to the geographical area. Included are 20 per cent of the nation's cattle, 28 per cent of its sheep, and 25 per cent of its hogs. The hogs, of course, come chiefly from the corn-raising eastern and southern areas. Most of the cattle and sheep are range animals put out to graze on the grasses of the plains—nourishing grasses that often appear to a stranger to be nothing more than thin brown weeds. The cattle are to be found in many districts throughout the valley. They are principally beef cattle, except that Missouri has an important dairy industry. A regular cycle is followed in raising the beef animals: they are bred and brought to maturity on the open ranges, then a high proportion are sold for fattening in the corn belt, though some grass-fattened cattle move directly to the packing plants; every autumn the feed lots of eastern Nebraska and of Iowa, Illinois, and Indiana buy range cattle, which they cram with corn in the ensuing winter and summer. The cattle population in the Missouri Valley was high in the early 1930's, but was sharply reduced by the droughts that followed. The herds came back in the 1940's, and of late the ranges have been reported well occupied in most dis-

tricts. A common breed is the "whiteface"—that is, the red Hereford with white markings.

Among the great sheep-raising states of the nation are Wyoming and Montana. An official report for 1945 listed Wyoming as the second state in the nation in value of sheep and wool produced, ranking it behind only Texas. The biggest sheep ranch is said to be the 300,000-acre tract of the Warren Livestock Company near Cheyenne, Wyoming. Sheep-raising is a hard, hazardous business. The sheep is a pretty stupid creature with strong herd instincts, and is exposed to many natural enemies. Often the individual sheep or lamb requires personal attention, especially at lambing time in the spring. The number of sheep in the Missouri Valley fell off markedly during the 1940's; herders were hard to get during World War II, and prices for wool and mutton were relatively low. There is a relationship between the number of sheep raised and the way the prices of wool, mutton, and lamb meat fluctuate with reference to the price for beef cattle. If you can make more money raising cattle, you turn to them; if the sheep-wool index is up, you go back to the bleaters. Sometimes competition of foreign wool and synthetic materials has hurt. By 1950 the price of wool had risen sharply to almost double its 1940 level, and it appeared that the herds of sheep in the Missouri Valley would increase considerably. Perhaps this growth may be encouraged by the report from a United States Senate watchdog committee in December 1950 that the nation faced a critical wool shortage because the Munitions Board had failed to stockpile the commodity.

Much has been heard in the past about the bitter range

warfare between "sheepmen" and "cattlemen." There was hard feeling indeed, and the cattle-raisers especially resented the inroads of sheep on the range. This was generally attributed to the damaging effects on the grasses of the eating habits of sheep and their sharp hoofs. The rivalry is said to be ended now. Its origin was in the era when the broad public domain was unregulated or at least poorly regulated. In that day the cowboys and the sheepherders tried to beat each other to the public grasslands and sometimes took to force to get their way. Now much of the old public land has passed into private ownership, and what remains is under a better form of management. Federal lands are leased to stockmen by the Forest Service and the Bureau of Land Management on the basis of the proximity of private operations, and there is competition for the leasing rights. Strong political and economic pressures are exerted to use the public lands for private benefit, and it is evident that not all the evils in the situation have been cured.

A form of animal life once important to the economy of the region, but of relative insignificance now, is the furbearers. Indeed, the fur trade played a dominant part in opening up the Missouri River country, especially the upper end, after the travels of Lewis and Clark. The Astors from New York and many adventuresome trappers and traders from St. Louis made fortunes in this business. For many years furs found their way down the valley to the great market at St. Louis. Some persons think the peak in volume may have come early in the twentieth century. Changing ways of life, the whims of fashion, taxes, and other hard facts of economics all have figured in cutting down the

trade since then. Improved roads and other steps of progress broke St. Louis's near-monopoly on the market. At one time, for instance, peltry of bears had a place in commerce. As one dealer put it, "That was when streetcars had open platforms and the motormen wore bearskin coats in winter." Factories and other suppliers of steady employment have drawn off many of the commercial trappers. As another dealer said, "About the only trapping nowadays is by old men and kids and maybe sportsmen." Muskrat and wild mink have been the main catch for the market in recent times. These skins are fashionable for women's wear. The mink supply has been greatly augmented by "ranches" on which the little animals are raised commercially within fences. Raccoons, opossums, and skunks also come into the market, in smaller volume, as do red foxes and gray foxes. Occasionally a few wildcat, weasel, and wolf hides find their way to the dealers. Federal poisoning projects have been cutting down such predatory beasts as coyotes in the Wyoming sheep country.

Industry has lagged seriously in the Missouri Valley, yet there is general acceptance of the belief that the valley's economy needs to stand henceforth on a broad base of industry and agriculture. Widespread realization of the necessity of getting industrial development exists, and some new enterprises have appeared, but so far the benefits are more or less hit-or-miss from the basin-wide point of view. Since the mechanization of farming has cut down the rural population, it has generally been recognized that only new industry can increase the number of inhabitants in the valley.

Manufacturing data confined to the territory actually within the basin unfortunately are lacking up to now. The

Department of Commerce has made some studies covering all ten states of the Missouri watershed. This information gives some idea of the situation, but obviously results in some highly incorrect showings because it includes parts of most of the states that are outside the basin and that have little in common with the region under consideration here. The Department has contemplated making detailed breakdowns from census reports, breakdowns similar to the findings on basin population that it made by counties. The result should offer the planners highly useful information. In the meantime, generalities drawn from the state-wide data furnish clues to the situation.

For instance, the Department noted that the Dakotas were the least industrialized states in the region. It observed that manufacturing has more than double the importance of agriculture as a source of income for the people nationally, but that the reverse is true in all the basin states except Missouri, where manufacturing income exceeds agricultural. The latter statement is manifestly incorrect, however, as applied solely to the portion of Missouri within the basin. The departmental analysis also found that the proportion of manufacturing workers in the basin states increased from 27 per 1,000 population in 1939 to 45 per 1,000 in 1947. Again, however, the effect of busy industrial districts beyond the basin boundaries must be borne in mind.

Certain figures from the departmental study can be accepted readily for two of the states, Nebraska, which is wholly within the basin, and South Dakota, virtually all of which is within the basin. These may be tabulated as fol-

lows, including the United States as a whole for comparative purposes:

ITEM	1939	1947
Industrial workers per 1,000 population:		
Nebraska	13.7	28.8
South Dakota	7.8	13.8
United States	59.7	83.0
Number of industrial production workers:		
Nebraska	18,000	37,000
South Dakota	5,000	8,000
United States	7,808,000	11,916,000
Value added by manufacture:		
Nebraska	$68,139,000	$260,658,000
South Dakota	$19,619,000	$51,398,000
United States	$24,487,000,000	$74,426,000,000
Proportion of income from agriculture:	1940	1948
Nebraska	20.4 per cent	35.4 per cent
South Dakota	31.5	50.3
United States	7.2	10.2

Incidentally, the Department pointed out that the disparate increase between 1939 and 1947 in values added by the manufacturing process was largely inflationary. Current figures would make the comparison even more startling, the inflationary movement having accelerated since 1947. The rise in the proportion of income derived from agriculture as between 1940 and 1948, and in spite of the relative gains of industry in Nebraska and South Dakota, is doubtless to be explained by the improved economic position of agriculture generally.

An amazingly wide range of possible forms of industrial development for this region can be listed on the basis of a survey by the Midwest Research Institute, a private, non-

profit agency at Kansas City, Missouri, which made its study for the Army Engineers. The findings of the institute's survey are augmented by those of the Department of Commerce, plus some things that are of common knowledge. Such a list naturally includes some industries already of local importance at some places in the valley and some that exist in embryonic form, but it also shows many prospects for new endeavors fostered by modern technology. In many instances the possibilities depend on more electric power, better water supply, improved transportation, or discovery of ways to reduce costs. In the list of potential industrial developments that follows, it is obviously not feasible to suggest any order of priority or of rank in employment and dollar yield. The list:

Mining and refining metallic and nonmetallic minerals.
Metal fabrication.
Chemurgy: the conversion of field and forest raw materials into manufactured products; examples: fats, proteins, carbohydrates.
Conversion of coal, lignite, shale, and natural gas into synthetic liquid fuels and chemical raw materials; also, more production of these basic fuels.
Chemical processing, including some critical defense materials.
Oil production and refining.
Frozen foods and canned foods.
Grain-milling, notably for flour.
Meat-packing.
Sugar-refining.
Processing dairy products.
Malt liquors.
Sorgo-syrup, from sorghum starch.
Poultry-raising, also poultry grit production.

Vegetable oils.
Seed-processing.
Wool-processing and scouring.
Paper and paper products.
Wood products.
Tanning, and leather products.
Phosphates, especially for fertilizer, also for detergents and other uses.
Insulating-board manufacture.
Alfalfa dehydration.
Industrial alcohol.
Flax straw.
Soybean processing.
Ceramics, including brick, tile, and pottery.
Heavy plants of national defense types.
Light manufactures, producing, because of the high freight rates in much of the region, articles of relatively low weight and high value.
Service establishments, utilizing chiefly brain workers, which do not need to be in big cities or to have extensive shipping facilities.

Only a few small plants in the category of heavy industry, such as steel mills and foundries, exist in the region now. A big advantage for development, as reported by the Midwest Research Institute, is the fortunate presence of abundant, inexpensive fuel in proximity to tremendous supplies of easily obtainable raw materials. The basin and contiguous areas from which it might draw are laden with vast reserves of solid and liquid fuels and of major and minor minerals. The institute's elaborate survey report repeatedly describes the supplies of various natural resources as "inexhaustible," "unlimited," "immense," or "vast." Reading this report gives the definite feeling that in the Missouri

Valley the nation has a sleeping giant. Unfortunately, the report has not had wide publicity: only four copies of it were made available for public inspection, filed in Army Engineer offices in St. Louis, Kansas City, Denver, and Omaha. This represents a questionable economy in saving the cost of printing a valuable document.

The institute's study, an inquiry into basic economics of the region, was made in 1947 at a cost to the Army Engineers of $57,000. The purpose of obtaining it was to provide a guide for the Army Engineers' consideration of whether commercial navigation in the Missouri River should be extended upstream above Sioux City, Iowa. Eventually the Engineers came out in support of the engineering feasibility of navigation all the way across both Dakotas. The report deals with the entire basin and even the effects of utilizing natural resources beyond the basin boundaries, rather than confining itself to the strip of territory that might have access to navigation.

Important minerals found not far beyond the Missouri Valley, which could play a part in remaking the valley's economy, include: copper, lead, zinc, iron, gold, silver, molybdenum, vanadium, manganese, cobalt, nickel, tungsten, antimony, and arsenic. Some of the great copper mines are operated by the Anaconda Copper Mining Company at Butte, Montana, a short way beyond the Continental Divide.

Underground resources awaiting development within the Missouri Valley, as listed by the Midwest Research Institute, include:

Uranium: more will be told about this later in this chapter.

"Vast stores" of nonmetallic minerals: ceramic clay; bentonite (South Dakota and Wyoming); gypsum (all the states except Missouri, Nebraska, and North Dakota); volcanic ash.

A "vast storehouse" of coal, lignite, petroleum, and natural gas, augmented by oil shales.

Great reserves of phosphate rock, in Wyoming and Montana and, near by, in Idaho (to be discussed hereafter).

The nation's only known commercial deposits of burley clay and high-alumina diaspore clay, in Missouri.

Huge salt deposits, in Kansas.

Feldspar and mica (South Dakota, Montana, Wyoming, and Colorado).

Much potash, in volcanic rock (Montana and Wyoming).

Sodium carbonate (Wyoming).

High-grade barite concentrates (Missouri).

Gold: to be discussed hereafter.

A large outcropping of anorthosite rock, in Wyoming; World War II research produced aluminum from anorthosite.

The nation's largest reserve of manganese, principally in inferior-grade deposits along the Missouri River in South Dakota.

Iron (Wyoming).

Minor metal deposits: titanium, beryl, tin, tungsten, cobalt, lead, zinc, chromium, copper, nickel.

Great stores of dimension stone and crushed stone, and of gravel and sand.

Limestone, from which cement is produced in all states except North Dakota.

One of the world's largest gold mines is the famous Homestake Mine at Lead (pronounced *Leed*), in the Black Hills of South Dakota. It has been credited with producing more than $500,000,000 in the precious metal. Gold was discovered in this vicinity by a soldier in General George A. Custer's troops in 1874. The Homestake claim is said to

have been bought three years later for $77,000. Lead, like Denver, is a mile high; the shafts of this mine penetrate the earth virtually to sea level. Lack of adequate labor is said to have been hampering Homestake's operations. Lead is a quiet, workaday town, perched on steep hills and extensively undermined. Its neighbor, Deadwood, tries hard to retain some of the hell-raising flavor of the "old West."

Within sight of Helena, in a cup in the Montana mountains, a dredge of supersize long has worked day and night at extracting gold from the loose soil of the valley floor. This is a self-contained operation, with the extracting equipment inside the craft. The dredge, strung with electric lights, maintains a small man-made lake, in which it shifts location as required.

Something more precious and vital than gold has been discovered at Sundance, in the Bear Lodge Mountains of northeastern Wyoming, about forty miles west of Homestake Mine. This is uranium, the fearful and wonderful foundation of the atomic age. The discovery was reported in March 1950 in an Associated Press dispatch from Washington dealing with the various sources of uranium available to America. The dispatch spoke of the Wyoming find as "the biggest boost for hopes of stepping up the uranium output at home." It quoted mining men at Sundance as saying this was believed to be "the largest deposit of uranium ore and rare oxides anywhere in the world." The discovery occurred in August 1949, but was not disclosed until tests had been made. It was stated that the deposits were long and wide, but could be worked by cutting in open pits, much easier and cheaper than shaft mining.

Meanwhile, a $45,000,000 atomic plant of secret char-

acter is being erected for the Atomic Energy Commission about twenty-four miles northwest of Denver, between Golden and Boulder, Colorado, in the Rocky Mountain foothills. The 2,500-acre site had been largely wasteland. Among the reasons for selecting it were relative military invulnerability, good weather, and nearness to a big city. It will employ about one thousand workers, will not give off dangerous wastes, and will have only moderate requirements for electricity, water, and gas. The Dow Chemical Company of Michigan will operate it for the AEC. An Associated Press science writer, Frank E. Carey, has speculated in a dispatch from Washington that the plant may involve an entirely new process for making atomic-bomb materials or an improvement of an old process. Radioactive materials, it was disclosed, will be handled at this establishment, described by AEC as a "production" plant.

In the spring of 1951, not long after the plans for the atomic installation at Golden were announced, it was disclosed that AEC was preparing to build another big atomic plant among the rough hills along the Missouri River twenty miles west of St. Louis. The *St. Louis Post-Dispatch* asserted that this would be used for a new method of manufacturing materials, presumably fissionable, for the atomic bomb. AEC said only that it contemplated a "major research operation" there and that the site would be used for "development activities." It was learned, however, that the operating force was expected to number several thousand persons. A contract was awarded for engineering and architectural services. Disclosure of the asserted use of the plant for production of bomb materials came about as the result of announcement by an electric utility system that it ex-

pected to build for this AEC facility an electric generating station that would be big enough to meet the ordinary needs of a good-sized city.

Ever since the war in Korea began, the awesome power of nuclear fission, or "atom-splitting," as expressed by the atomic bomb, has been uppermost in the public mind. Nevertheless, this power has many beneficent uses and potentialities, one of the greatest of which is as a new fuel for producing electricity. The Interagency planners have made note of this possibility, though as yet they have seen no reason for altering their hydroelectric power scheme.

The first practical plan for use of atomic energy to make electric power was related to the highly desirable exploitation of the major phosphate rock deposits. It was advanced in June 1950 by Charles Allen Thomas, distinguished atomic scientist, chemist, and industrialist. He suggested that a power plant of fair but not huge size be set up for operation by private industry. Idaho was envisioned by him as the site because of its particularly large phosphate reserves. A few months later, his concern, the Monsanto Chemical Company of St. Louis, took the first steps looking toward actual creation of such a plant. It entered into an agreement with the AEC to carry on a study to determine whether the proposal would work.

Under the Thomas idea, uranium would be moved into the plant under government guard and set up in atomic piles for the usual chain reaction. The terrific heat of the fission, heretofore wasted at atomic-bomb plants, would be used as the fuel for the electric-power plant. Plutonium, one of the new elements of the atomic era, more effective for the bomb than the uranium isotope originally employed,

would be an end product of the proposed plant. It would be hauled away under government guard for use in atomic weapons. Because electric power produced in such a plant would be relatively costly, the private corporation operating it would be paid a fee for making the plutonium. There would be adequate safeguards for national security. Dr. Thomas proposed that the output of electric energy be utilized in production of elemental phosphorus from the rock deposits.

Phosphorus and its phosphate compounds play a very important role in our national life. They are notable plant nutrients, and by far their biggest use is as fertilizer. The prospect of obtaining them on a large scale either in or near the Missouri basin is of great significance to this region, because much of its soil badly needs the enrichment of phosphates. A 1947 Bureau of Mines study reported that our major potential fertilizer deficiency, estimated at 1,713,000 tons annually, exists in the western north-central, mountain, and Pacific states, an area taking in much of the Missouri basin. Ironically, the bureau found that large economic resources for production of low-cost fertilizer exist in these states. Availability of ample electric power at reasonable cost is an essential for phosphate development. The bureau's analysis showed that the bulk of phosphate fertilizer from the deposits in Wyoming, Montana, Idaho, and northeastern Utah could be expected, if developed, to move onto the croplands of the Missouri Valley states. The Midwest Research Institute report agreed with this view, predicting a tremendous increase in use of fertilizers in the valley. The institute also noted that many of the irrigated soils respond well to phosphate fertilizer.

Florida and Tennessee have been the notable sources of phosphates up to now, but their deposits are being depleted. This makes the Western reserves loom in even greater importance. The Department of the Interior has called attention to the high rank held by phosphates as a Missouri watershed resource. Some idea of the immensity of the problem of utilizing the phosphate reserves has been given by the Bureau of Mines. To meet the annual deficiency of 1,713,000 tons mentioned above, the bureau estimated, would call for a capital investment of $1,700,000,000 for plants and mines, exclusive of power installations. This figure was at the 1947 cost level; it would be much higher at current prices. Operating forces were fixed at 6,200 men. Annual consumption of materials was placed at 5,139,000 tons of phosphate rock, 860,000 tons of silica, and 492,000 tons of coke. Furthermore, it was calculated that the production would demand a continuous electric-power load of 950,000 kilowatts. As matters stand in the Missouri Valley today, that is a huge electric capacity. By way of contrast, it is about the right capacity to supply an industrial city of 1,000,000 population.

Where phosphorus in the soil is deficient, plant growth is poor and maturing slow, and the plants themselves have insufficient phosphorus. As a result, animals fed on such plants grow poorly and are liable to certain diseases. Slow maturing can be a troublesome factor where summer is short, as in the northern part of the basin. Phosphorus and other elements of fertility leave the soil by erosion, leaching (dissolving by moisture), and excessive cropping. Phosphorus and its compounds are requisites of a proper human diet, being essential constituents, for example, of flour and

baking powder. There is a large demand for phosphates for manufacture of soaps and other detergents.

The United States is credited with possessing more coal reserves than the rest of the world, and the Missouri basin is regarded as the greatest single latent source of coal. Wyoming has the biggest coal deposits of any American state. Its supply is mostly subbituminous—that is, relatively low-grade—but some of the beds are bituminous. Elsewhere in the valley are found small amounts of the higher grade semi-anthracite and anthracite coals. Lignite, which ranks below subbituminous coal in quality, lies in the Missouri basin in great quantity. The basin states have been consuming more solid fuel than they have dug from their reserves, but they could be self-sufficient.

The great significance of the solid fuel reserves is that they are largely capable of transmutation into synthetic oil or into the raw stuffs of the vast field of modern chemistry. The synthetic oil can be refined into gasoline and other motor fuels, as Nazi Germany demonstrated convincingly in World War II. National emergency conceivably might demand early exploitation of this resource. The change-over of drab coal or lignite into substances that make the dreams of chemists come true holds fascinating possibilities. The solid-fuel reserves throughout America constitute more than ninety-nine per cent of the nation's fuel reserves, the rest being petroleum and natural gas. Mainly the solid-fuel reserves are coal and lignite, but a minor proportion of oil shales is included. The national center of coal reserves is in south-central Nebraska, not far from the geographic center, which is in north-central Kansas.

Reserves of lignite, estimated by the Bureau of Mines

at 939,000,000,000 tons, are practically untouched. They constitute almost one third of our solid-fuel reserves of all kinds. North Dakota has the lion's share of the lignite—600,000,000,000 tons, according to the federal figures. Eastern Montana is next, with 315,000,000,000 tons. The other 24,000,000,000 tons are in South Dakota and Wyoming among the Missouri watershed states, and scattered in Texas, Alabama, Mississippi, Washington, California, and Arkansas. Of the present annual production of lignite, North Dakota turns out almost 3,000,000 tons, or 96 per cent of the national output.

Much of the lignite production is by strip mining, in open pits, and leaves behind great unsightly piles of wasted earth. Tall, powerful steam shovels tear away the overburden of earth and dig out the thick veins of lignite, which is loaded on motor trucks or railroad hopper cars. One such operation, alongside U.S. Highway 83 at Garrison, North Dakota, is said to yield several hundred thousand tons a year. Indeed, the Army Engineers and their contractors found themselves engaged in the wholesale mining of lignite not far away, at the site of Garrison Dam. In connection with the vast excavations for this dam, it is estimated that 3,670,000 cubic yards, or about as many tons, of lignite will be removed and saved. It is too valuable to waste, but it presents an economic and political headache. Within the first few years after the start of construction of the dam, a stockpile of 500,000 tons of the stuff was built up on the east side of the river, and several hundred thousand additional tons were stored in several piles on the west side. Army Engineers drive visitors over the bigger stockpile in buses or cars as a means of impressing them. The cost of

salvaging this lignite has run about thirty cents per ton higher than the expense of merely shifting earth. The lignite's commercial price was running around two dollars per ton, but private mining interests had no desire to find the Army in competition with them. The government of North Dakota has tried to find some use for the material, such as employing it as boiler fuel for public institutions, but so far has not been successful. A minor portion is consumed in the central heating plant of Riverdale, the dam-construction town. The bulk, however, is piling up, a blackened white-elephant by-product of progress.

One big trouble with lignite as it occurs in nature is its high moisture content and low heating value. Its moisture content is about 35 per cent, its heating value about 7,000 British thermal units per ton. (Ordinary domestic coal has little moisture and perhaps 12,000 B.T.U.'s per ton.) Federal experiments have shown that reduction of the moisture to 5 per cent increases the heating value to 10,000 or 11,000 B.T.U.'s per ton. The Bureau of Mines has been working on various methods of drying lignite. If it can develop an economical way of doing this, lignite may well compete with bituminous coal. Outstanding consumers of such improved lignite as direct fuel might be new electric-power plants. Naturally, such an advance would be of great aid to this power-hungry region. Recently the bureau completed a $750,000 lignite laboratory at Grand Forks, North Dakota, the first to be devoted solely to research in lignite. It includes a pilot plant for drying methods. W. G. Sloan, however, told the Interagency committee at one of the last meetings he attended that a larger plant, located directly in the lignite fields, was needed. He said the Bureau of

Mines had sought for three years in succession to obtain a $125,000 appropriation to get this started, but that the request had been eliminated from the official budget at Washington each time. The bureau also has been trying a lignite-drying method at Golden, Colorado.

For several years the bureau has been operating at Louisiana, Missouri, a test plant in which low-grade coals from the Missouri basin have been converted to oil. One of the first raw materials used was a Wyoming coal. This plant started out using a process of conversion called hydrogenation, which involves combination of hydrogen with the original material. Lately it has been preparing to go into action with a second process, gas synthesis, called the Fischer-Tropsch method. This plant has turned out Diesel oil good enough to operate a streamlined train on the Burlington Railroad in a trial. The bureau also has been making synthetic fuel from oil shales at Rifle, Colorado. So far the end products of these plants have not been carried to a high degree of refinement, but it is understood that only normal manufacturing steps would be required to convert them into high-grade motor fuels. Nevertheless, there remains the difficult though not insoluble problem of bringing these synthetic processes down to a cost level on which they can compete with products made from natural petroleum.

By a stroke of irony, three of the bureau's experimental plants, at Grand Forks, Louisiana, and Rifle, are outside the Missouri basin, though not very far outside. The fourth, at Golden, is near Denver.

Meanwhile the oil industry of Wyoming has been pressing ahead. Plans were made in 1950 for a new $60,-

000,000 pipe line, 1,080 miles long, to run from Worland, on the Big Horn River in the oil fields of northern Wyoming, to the refinery center at Wood River, Illinois, near the mouth of the Missouri River. Five major oil concerns joined in projecting this common carrier for crude oil. A $12,000,000 plant to extract sulphur from the natural gas arising from oil wells was built near Worland in 1950.

An intensive movement is under way to exploit petroleum believed to lie beneath the plains of North Dakota. What has been called one of the largest blocks of oil-land leases ever assembled in the history of the business has been obtained by Union Oil Company of California, with interests taken also by Signal Oil and Gas Company and Hancock Oil Company. The block covers more than 2,000,000 acres, including 12,000 individual leases. The press has reported that various oil interests now have at least 35,000,000 acres, or seven ninths of North Dakota, under lease. At the remote town of Tioga, in northwestern North Dakota, an oil well reported by the United Press to be the first successful well in the state was brought in by the Amerada Corporation of Tulsa, Oklahoma, in April 1951. It was the culmination of thirty years of wildcatting in the state. Some North Dakota landowners bemoaned the fact that they had sold oil rights too early in the boom, for they found that neighbors who sold later obtained considerably higher prices. Montana has an oil field near Shelby. One of the great natural-gas pools of the nation is found in Kansas in the southern part of the Missouri basin.

Some of the valley's slumbering mineral resources are marginal in character. International conditions, economic reasons, and technological advances, however, are likely to

combine to make their exploitation desirable. Recently the Bureau of Mines set up a team to determine the feasibility of federal aid to private industry for "exploiting promising mineral deposits in the Upper Midwest essential to the defense program."

One of the marginal resources is the manganese at Chamberlain, South Dakota, where expenditure of a few million dollars in experimental and preparatory work is required to pave the way for commercial action. Manganese and chromite are critical materials in national defense, yet this nation has been importing something like three quarters or more of its supply. A Department of the Interior representative has stated that the largest known deposits of chromite ore in the world exist in the Missouri basin, principally in Montana. This ore is somewhat lower in grade than that imported from Africa. The Bureau of Mines has been considering means of beneficiation, or enrichment, of the native ore. It has sent Missouri basin chromite to Boulder Dam, where electrolytic chromites have been made from it by new methods that have appeared to hold promise. John Hersey has reported in *The New Yorker* that early in 1951 Senator Murray called on President Truman to ask for additional power for Montana because new plants for chrome, manganese, and aluminum were being built there.

Talk of mining prospects naturally is not limited to mining engineers. Everybody interested in the basin gets into the conversations. For instance, I. J. Matthews, a district manager of the Bureau of Reclamation, waxed enthusiastic before Interagency one day on the minerals lying dormant in Wyoming. He said: "Why, we have titanium valued at approximately $5,000,000,000 in Iron Mountain

near Cheyenne. Titanium is extremely critical and it is valuable in connection with the production of gas turbines and in jet propulsion."

Then there is beryl, called an essential minor mineral, important in national defense and used for a wide variety of industrial purposes. Among its properties are hardness and high electrical and thermal conductivity. Beryllium, the rare metallic element in this aluminum silicate ore, has uses in the field of atomic energy similar to those of graphite and heavy water, and is employed for X-ray tube windows and as an alloying agent with copper. The Black Hills of South Dakota are America's main source of beryl. The material is found chiefly in a granite formation known as pegmatite, which also holds feldspar, quartz, and often other minerals as well. The trouble is that beryl-mining has always been incidental to recovery of the other minerals in pegmatite. The beryl is hand-sorted, and particles of it get lost in this process. The Bureau of Mines is engaged in intensified research to find effective means of mining beryl and recovering its small crystals.

If, in all this discussion of the latent resources of this region, there seems to be constant repetition of the part the federal government is playing, that is natural. In the first place, many of these resources are important to the nation as a whole. Secondly, the cost and character of the research and experimentation and aid necessary are far beyond the means of the individual states, especially of the less populous and less wealthy states in which many of the resources lie in waiting. The interest of Uncle Sam's agencies is universal. They have even figured out that the extensive and useless-looking clays of the Badlands possess

physical properties that might give rise to industries on the adjoining plains.

The Missouri Valley is aware that it may benefit from the trend to decentralization in industry, particularly to the wide dispersal of factories essential to national defense. The lonely plains, with mountains to their west and the more intensively developed Middle West on their other side, offer some advantages in the way of security for such plants. The Department of Commerce has reported that the Missouri basin has come in for considerable attention in the planning of the National Security Resources Board and the Munitions Board.

Planners for the basin also have pointed out that the establishment of a few major basic industries would attract a series of secondary industries that would help advance the regional economy. If more wealth is produced in the region and more people live there, the market for an endless variety of things will grow: more houses, furniture, electrical equipment, automobiles, radios, newspapers, food, clothing, and a lot of other things. The Midwest Research Institute pointed out that a new cannery, for example, would create a demand for more cans, jars, packing-cases, cartons, bottles, caps, and labels. The region, if it develops industrially, not only will produce more goods but will import more goods from other parts of the country. The biggest expansion in the basin in the 1940's, according to the Department of Commerce, was in food processing. This field could have still greater growth with the modern quick-freeze process. Regional Director Brokaw of the Department of Commerce has asserted that industrial production costs in the Missouri basin are less than in other parts of

the country because the workers are more efficient. He also has declared that workers can find better and cheaper living conditions in this region than in the bigger cities.

His department has been interested in an effort to establish an industrial alcohol plant at a certain place in the basin, but lack of an assured large supply of water has prevented it. He explained: "The plant would consume 6,000 bushels of wheat a day, which isn't very much in this wheat-growing country, but it would also require 1,000,000 gallons of water a day, which it cannot now count on. Many other chemical processes are developed to a point where production could be started today, if we had water."

One of the quirks of the valley of contradictions is its relative lack of breweries. As to this the Midwest Research Institute report said: "Only 38 establishments manufacturing malt liquors are located within the basin, and the region in general is deficient in beverages. Expansion of this industry would provide additional markets for barley and other grains."

CHAPTER X

Suit Pattern for a Giant

The biggest thing happening in the Missouri River valley today is the federal program, with state co-operation, for protection, control, and development of the water and land resources. Estimates of the cost of this undertaking run into billions of dollars, and a big, spectacular start has been made toward carrying it to fulfillment.

This is the Interagency program, sponsored by the Missouri Basin Interagency Committee. It is an enlargement and outgrowth of the Pick-Sloan plan, the natural heir and successor of Pick-Sloan. The Missouri Basin Interagency Committee is a co-ordinating body representative both of the numerous federal agencies involved in this long-range project and of the state governments. It is voluntary and extra-legal, one of the contradictions of the valley: unofficially official, but officially unofficial. It has no real power, yet it has achieved growing influence and recognition since it was set up in August 1945. Its establishment virtually coincided in time with the atomic bombing of Japan, which brought World War II to a close. The expenditure on the Interagency program already has come close to two thirds of the $2,000,000,000 spent on the atomic bomb before Hiroshima.

Early in the 1940's federal officials at Washington realized that some co-ordination of the independent agencies

would have to be attempted in order to carry out work in contemplation for the Missouri Valley and elsewhere. No doubt this was at least a tacit recognition of the threat against their established bureaucratic empires by the valley-authority principle. They were taking early notice of the idea of watershed regionalism. Their solution was the creation of the Federal River Basin Interagency Committee by an agreement among heads of the Army's Corps of Engineers, the Department of the Interior, the Department of Agriculture, and the Federal Power Commission. Later the Department of Commerce joined, followed not long ago by the Federal Security Agency. This federal committee, acting, as the cliché goes, "at the Washington level," brought into existence as its first subordinate the Missouri Basin Interagency Committee, often called the MBIAC in official documents. (The next subordinate was the neighboring Columbia Basin Interagency Committee, and others have followed.) As new federal departments were added to the roster, the federal membership of the Missouri Basin Committee grew from four to six. The state membership consists of delegates elected by the Missouri River States Committee, a strong, unofficial organization made up of the governors of the ten basin states and technical aides of the governors. At first the River States Committee put four governors on Interagency, selected for geographical and political balance. When the Department of Commerce joined MBIAC, a fifth governor was added to the delegation, but when the Federal Security Agency was taken in, the governors' group postponed action on enlarging their delegation.

On the rare occasions when it makes formal policy de-

cisions, Interagency acts only by unanimous vote of its members. The chairmanship is confined to a federal representative, chosen by the vote of only the federal members. An aide to the chairman serves as secretary. The federal members of MBIAC are selected by the heads of their respective departments. Members of the committee, all likely to hold their places at least through 1952, are:

Ex-head, Gladwin E. Young, Lincoln, Nebraska, field representative of the Department of Agriculture for the Missouri basin. His departmental job involves co-ordination of the numerous agricultural bureaus in the valley work.

Charles E. Brokaw, Denver, Colorado, regional director of the Department of Commerce. His region only partly coincides with the river basin.

Ben H. Greene, Chicago, Illinois, regional chief engineer for the Federal Power Commission. His territory also only partly coincides with the basin. He succeeded Mr. Young as chairman in July 1951.

Glen J. Hopkins, Kansas City, Missouri, representing the Federal Security Agency. He is officer in charge of the Missouri drainage basin office of the United States Public Health Service.

Harrell F. Mosbaugh, Billings, Montana, representing the Department of the Interior as chairman of the Interior Basin Field Committee, which co-ordinates the valley work of this Department's various bureaus. Until the spring of 1951 he had been a specialist in the basin for the Department's Fish and Wildlife Service.

Brigadier General Don G. Shingler, Omaha, Nebraska, Missouri River division engineer for the Corps of Engineers. His territory exactly covers the watershed.

Val Peterson, Republican, Governor of Nebraska and chairman of the Missouri River States Committee.

Sigurd Anderson, Republican, Governor of South Dakota.

John W. Bonner, Democrat, Governor of Montana.

C. Norman Brunsdale, Republican, Governor of North Dakota.

Forrest Smith, Democrat, Governor of Missouri.

Mr. Greene is the only member who has served continuously in Interagency from the start. He has rarely missed a meeting. Neither Mr. Sloan nor General Pick was among the original members. A regional director of the Bureau of Reclamation, who at that time was Mr. Sloan's superior officer, was the first Interior representative. After Mr. Sloan succeeded him on MBIAC, the Department evidently began to realize the full implications of the valley program and set up its co-ordinating field committee, of which Mr. Sloan was first chairman. He retired from federal service at the end of 1950 and was succeeded by Mr. Mosbaugh. General Pick was on duty in the China-Burma-India war theater when Interagency was started. The officer who had replaced him temporarily as Missouri River division engineer was the committee's first chairman. Mr. Sloan succeeded General Pick as chairman when the general was promoted to Chief of Engineers. The Army Engineers follow the logical practice of assigning the division engineer to MBIAC. Brigadier General Samuel D. Sturgis, Jr., held this post for two years after General Pick. When General Sturgis was transferred to command of Fort Leonard Wood, Missouri, he was succeeded by General Shingler. The Department of Agriculture arrangement for several years has been comparable to that of the Department of the Interior in a realization of the need to attempt internal co-ordination of bureaus. At first this Department was represented by a regional head of the Soil Conservation Service.

Two main principles have been followed in choosing

representation of the governors: inclusion of both the upper and lower parts of the basin and of both Republicans and Democrats. Minnesota alone among the ten basin states has shown virtually no interest in Interagency, which perhaps is understandable, little of that state being in the basin.

Functions of the various governmental agencies in Interagency may be listed as follows:

Corps of Engineers: flood control, navigation, electric power, stream control, water supply.

Department of the Interior: irrigation, power, and water supply by the Bureau of Reclamation; appropriate services by the Bureau of Mines, Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, U.S. Geological Survey and National Park Service; and a financing arrangement for the Smithsonian Institution for archæological and paleontological studies with the states.

Department of Agriculture: specifically a proposed speeded-up program on a vast scale for agricultural development; in general, services by virtually all of the department's ubiquitous activities.

Federal Power Commission: study of the electric-power supply and demand, and checking of all plans to see that the maximum opportunity is offered for hydroelectric power development in relation to other features.

Department of Commerce: economic and population information and surveys, Weather Bureau, Coast and Geodetic Survey, and the Inland Waterways Corporation.

Federal Security Agency: notably for work of the Public Health Service and in particular for work on stream pollution.

State governments: alignment of work of numerous state agencies with that of some of the related federal activities; also dealing with such difficult problems as the relocation of highways necessitated by the big reservoirs.

"Interagency program" is a term used here advisedly. It is vastly more comprehensive and inclusive than the original Pick-Sloan plan. It has taken in some big projects that antedate Pick-Sloan; it has added, among other things, the tremendous agricultural and soil-conservation program; it has brought in a variety of federal agencies as partners in the undertaking with the original Pick-Sloan pair (Bureau of Reclamation and Army Engineers); and it is also treating the states of the area as planning and fiscal partners. Indeed, what is going on here constitutes the preparation and application of a huge regional plan. It is city-planning plus, with a giant's slide rule and T square on a Gargantuan set of blueprints. Pick-Sloan was essentially a combination under pressure of the irrigation and electric-power plans of the Bureau of Reclamation with the flood-control, navigation, and power plans of the Army Engineers. Within eight months after Pick-Sloan was written into law the MBIAC was established. Interagency has grown from a limited and inconspicuous beginning to a lively device of big government; it has stolen the show.

At the latest guess, the Interagency program contemplated the expenditure by all concerned of almost $14,000,000,000, including about $8,500,000,000 from federal coffers at Washington. The rest would consist of more than $5,000,000,000 that farmers and landowners would be expected to spend privately on desirable and doubtless profitable soil-conservation measures, and about $400,000,000 to be spent by the states and to some extent by counties or other local units, mainly for soil control. Later estimates are bound to send these astronomical totals higher as the impact of inflation makes itself felt more; the figures

given here were compiled as of 1949 or earlier. No idle dream is represented by them, however. The only dust gathered on a lot of the blueprints has come from the thick clouds of pulverized earth that have blown over scores and scores of actual construction sites. Expenditures and allotments for Interagency work aggregated more than $1,250,000,000 through the fiscal year ended June 30, 1951.

For that sum of money, which even today is hardly inconsiderable, the valley has obtained, notably, the following things so far: numerous dams and reservoirs either completed or under construction; extensive irrigation facilities, including canals, tunnels, and pumping stations (though little new land is irrigated yet); a start on the flood-control works, which already has prevented substantial amounts of damage in local areas; three quarters of the work on a nine-foot navigation channel in the Missouri River between its mouth and Sioux City, Iowa; some channel-stablization work along the Missouri, which not only helps navigation but also serves to protect some good bottomland from the vagaries of the stream; a start on the extensive hydroelectric power-generating and transmission program; and some advantages in the way of new places for public recreation on and around the reservoirs and in the fostering of fish and wildlife. In short, a very material start has been made on the necessarily long-range program of development—a start that serves to commit the valley and those responsible for the program to proceed eventually with the completion of many major features as presently planned.

Most of this was accomplished in a period of six years after the enactment of Pick-Sloan. If all the projects of the Army Engineers are completed by 1960 or soon thereafter,

9. *Fort Peck Dam, Montana. This has been the world's largest earthen barrier, four miles long. The huge reservoir ends at the rock-faced upstream dam wall.*

Paul Berg, St. Louis Post-Dispatch Pictures

10. *Garrison Dam on the Missouri River, North Dakota. Outlet works will go under the curving portion of the dam in the foreground.* CORPS OF ENGINEERS.

the best expectations will have been fulfilled. Some of these remain to be started. The Bureau of Reclamation, which feels that all but two of its key water-control structures have been built or started, has estimated that its program might be completed by 1980; however, the Federal Power Commission, evidently more skeptical, has asserted that the bureau might not get through until the year 2000. The agricultural program, if and when undertaken, is designed as a thirty-year job. Under strong political pressure from the Missouri basin states, Congress was coming through handsomely with annual appropriations for the Interagency program until the war in Korea started. Forthwith the allowances for the fiscal year 1950–1 were sharply slashed. What will happen in ensuing years, in view of the international situation, is anybody's guess, but there will be demands, generally well founded, to carry out as quickly as possible at least the big projects that have been started, especially those for electric power. President Truman's 1951 budget message strongly supported this idea.

Regardless of this setback in funds, the Interagency program continues to be a remarkable undertaking. "This is one of the greatest peacetime movements the world has ever known," Chairman Peterson of the Missouri River States Committee has declared repeatedly. Sometimes he has qualified this by suggesting that something Russia may have done within its forbidden boundaries may be larger.

The most spectacular projects, of course, are the dams and reservoirs. The number of dams has not yet been finally determined, but may be something like 147, big and little, not counting thousands of small structures envisioned in the agricultural plan for the creeks and other minor water-

courses. Outstanding among the dams will be six built by the Army Engineers on the Missouri River itself. In the phrase of General Pick, they will transform the muddy stream into a "chain of blue lakes" across the two Dakotas and eastern Montana.

Tremendous amounts of water will be impounded behind the dams. The various engineers have agreed that all dams in the valley program together will have maximum storage capacity of 110,000,000 acre-feet. One acre-foot is enough water to cover the area of an acre of land (43,560 square feet) to the depth of twelve inches. You get a better idea of how much water this combined impoundment would be after a little simple calculation: 110,000,000 acre-feet would cover the entire Missouri River watershed with water to the depth of about four inches; or it would cover the state of Rhode Island to the depth of 140 feet. The Army's six dams on the main stem will store about two thirds of the entire capacity. Nevertheless many of the lesser dams on tributaries are impressive engineering structures, with formidable volumes of water. Fort Peck Dam in Montana, uppermost of this Army set, was finished some years ahead of Pick-Sloan, but its full power-generating capacity has not yet been installed. The Army is engaged in the long-term task of building Garrison Dam, North Dakota, and Oahe and Fort Randall dams, South Dakota. It has been preparing plans for two other dams on the Missouri in South Dakota, Big Bend and Gavins Point, but was delayed in obtaining construction money for them. President Truman's 1951 budget message, however, provided for going ahead with Gavins Point, as it is an important factor in the electric-power installation. The Army is building the

good-sized Harlan County Dam on the Republican River in southern Nebraska. Besides Fort Peck, the granddaddy of the system, dams completed by the Army include Cherry Creek Dam, near Denver, and Kanopolis Dam, on the Smoky Hill River in central Kansas, both flood-control projects. In the basin of the Red River of the North, the Army has completed Bald Hill Dam, on the Sheyenne River in southeastern North Dakota, a collateral feature of the Interagency program.

The Bureau of Reclamation has completed 38 dams so far and had 8 others under construction in 1951. Those completed are 10 from the Pick-Sloan plan, 18 antedating Pick-Sloan, 9 for the Colorado-Big Thompson diversion, and Kortes Dam, a power project on the North Platte River in central Wyoming. Those under construction include Canyon Ferry Dam, on the Missouri River in the mountainous section of Montana, and Boysen Dam, in a mountain pass of the Big Horn River in northwestern Wyoming. The Bureau of Reclamation also has built extensive canals and tunnels for irrigation and some power plants.

What put Interagency in business as a regional planning agency was its decision, when it was about two years old, to set up a comprehensive fiscal program. At this point the question is not whether the planning is good, bad, or indifferent—there are differences of opinion about that, as will be seen later—but what the fact is. The answer is that Interagency made itself a planning agency, *de facto* if not *de jure*. It launched the fiscal program with some caution, for fear the sensibilities of the federal Bureau of the Budget or of Congress might be aroused. A terrific volume of detailed work was required to achieve the thick

statistical volume. To determine what activities of the states properly deserved inclusion was especially difficult at first. The scheme adopted was to show total estimated construction costs, divided by agencies, projects, and states; expenditures already made, current funds, desired annual allowances for the ensuing six years, and the amount needed thereafter; also annual costs of so-called continuing programs of service or investigation, as distinguished from construction. By the time the third annual revision was made, in September 1949, the programing was worked out in thorough and understandable fashion, and it was evident that the powers in Washington were not disturbed by this regional assumption of financial forecast. Actually the program proved to serve a good purpose in putting into accurate and comprehensive focus the whole picture of what numerous separate agencies proposed to attempt. The year 1950 passed, however, without a fourth revision. A technical subcommittee worked on the matter, but delays in congressional appropriations and uncertainties about the future prevented action. Nevertheless, Interagency contemplated resuming the program whenever feasible.

Each time there has been a revision the future six-year period naturally has advanced by a year. The 1949 revision took the data through the fiscal year ending June 30, 1956. Its principal totals were as follows:

Estimated total cost (public construction)	$8,519,350,127
Funds received through June 30, 1948	547,284,641
Costs, fiscal year 1948–9	194,121,116
Funds for fiscal year 1949–50	324,879,561

Six-year program, 1950–6 (yearly avg. $493,000,090)	2,958,005,580
Funds required after June 30, 1956	5,017,727,682
Annual costs of continuing programs	49,072,408

The "grand total, land and water resources development" of more than $8,500,000,000 was divided as follows: Bureau of Reclamation, $3,290,579,217; Department of Agriculture (mainly for its soil-conservation program), $3,092,328,000; Corps of Engineers, $2,102,400,751; Department of the Interior agencies other than Bureau of Reclamation, $23,777,159; South Dakota, $7,066,000; Nebraska, $3,199,000. Other participants in the fiscal program, although not involved directly in construction work, are the Federal Power Commission, Department of Commerce, Public Health Service, and the states of Colorado, Iowa, Kansas, Missouri, Montana, North Dakota, and Wyoming.

Interagency averages about nine meetings a year. It tries to meet in each basin state except Minnesota annually. At first it always went to the capitals, but then it realized that it could see—and be seen—more if it moved around, so it has met in a variety of large and small towns. It even held a floating session one fine spring day on a pair of Army boats tied together for a leisurely voyage on the Missouri River between Jefferson City, Missouri, and a makeshift landing-place near the mouth. Originally there was some idea of meeting privately, but that quickly disappeared. Instead, the largest available hall is chosen. There the committee members sit at a long table facing the audience, with a sign in front of each member to identify him. Committee members, even including most of the busy

governors, are seldom absent, and the governors send deputies if they cannot attend. The audience consists of numerous major and minor officials of the Big Three agencies (Army Engineers, Department of the Interior, and Department of Agriculture) and of the state in which the meeting is held, and usually, in the past, of groups of citizens of that state. Occasionally there are delegations with a grievance or a proposal concerning some particular project. If the governor who is host sponsors them, they are likely to be heard, but there have been instances when such complainants got little or no chance to sound off.

Theoretically the meetings are deliberative and instructive programs for the benefit of Interagency's own members, but in reality they are sounding-boards for ideas and a device to promote public interest and goodwill for the Interagency program. Speakers, including the committee members, generally address the audience rather than the committee. So many assistants of the Interagency members and representatives of special and self-serving interests attend the meetings that the effect is somewhat like that of a traveling theatrical company. This effect is heightened by the practice of displaying large maps and drawings of undertakings in the state concerned. These meetings have grown into an important form of convention, and are sought after by the towns. Badges are pinned on those attending, and they are invited to service-club luncheons and chamber-of-commerce dinners at which almost everybody of any importance and some people of small consequence get introduced and the leaders make polite speeches, rephrasing what they have been saying all day. After the novelty of Interagency wore off, however, the general pub-

lic tended noticeably to ignore its meetings. Lately the attendance often has been confined largely to those whose jobs require them to be present, with only a handful in the audience from the town where the meeting happened to be held. About once a year, when it is timely to put the heat on Congress for more appropriations, or when other problems arise, the governors call their Missouri River States Committee into session the day before an Interagency meeting.

Except in winter, Interagency and many of its followers usually stay over a day to inspect the nearest dam or other project. These inspections, conducted in a light-hearted atmosphere, are actually informative and useful in creating understanding of the immense program. Escorted by state highway patrolmen, the party moves swiftly over the undulating and sometimes dusty highways in a cavalcade of buses, private cars, and official cars. Once one of the buses got stuck in a narrow tunnel in the Black Hills and had to back out. Later in the day it broke down in a lonely spot, marooning its load of distinguished and minor figures for several hours. Such an expedition crossed a cold, snow-clad pass of the Continental Divide in Colorado twice in one day. When the Garrison Dam work was starting, Interagency was taken across the river in an old landing craft, amidst a shower of spray. The committee has cruised various reservoirs in motorboats. In Montana its cars have boiled up hillsides so steep that only goats should have essayed them.

The co-ordinating function of Interagency actually is carried out in the day-to-day contacts and communications of the technical personnel of the various agencies. The

committee gatherings have served the main purpose of creating friendly relations and understanding among the men of the ruggedly independent bureaus and agencies involved. Proponents of this plan, including the Interagency members themselves, insist that excellent co-ordination has come out of this. Without doubt this is correct in large measure. Operations have been made much smoother. Publicly, all is sweetness and light. Privately it is quite evident that some federal agencies hold certain plans and tenets of other federal agencies in low regard. Now and then an outsider can gather that officials of varying rank have something less than the highest respect for the ability or official conduct of their colleagues in other departments. State representatives not infrequently speak out against federal proposals. Maybe it is all part of a healthy shaking-down process. If so, that's another long-range phase.

You could count on the fingers of one hand the specific issues that have been settled formally by Interagency. Disputes over the plans for certain projects have been hanging fire a long time. On the other hand, the existence and influence of Interagency probably have prevented some other conflicts from coming to a head, without letting them reach public attention. The committee has come across a few hot potatoes; like skilled bureaucrats and politicians, it has tossed these about with ease. But perhaps the outstanding thing about Interagency has been the outspoken character of many of its deliberations. It has been amazing at times to hear both the federal members and the governors face unpleasant or troublesome facts, which they often bring out of their own accord. They usually have dealt with such things in a statesmanlike way and not as parti-

sans; furthermore, they have worked with a broad regional point of view, not a provincial one confined within state boundaries.

An outstanding factor in the whole basin is the great desire for more water in the dry western part and the anxiety to be freed of disastrous floods in the lower end. Indeed, the "Pick-Sloan law" itself—that is, the 1944 Flood Control Act—draws a sharp line at the ninety-eighth meridian: the O'Mahoney-Millikin amendment says in effect that water rising west of that line shall not be used for navigation east thereof in conflict with the needs of the western side for domestic, farm, and industrial use and for irrigation. The ninety-eighth meridian passes through the eastern ends of the Dakotas, Nebraska, and Kansas. These states and the other basin commonwealths west of them have their own special body and type of water laws, based on a different set of principles from the statutes of states where water is plentiful. All this has a distinct bearing on the planning and the thinking in the evolution of the Interagency program.

No single official document other than Interagency's six-year fiscal scheme purports to give a comprehensive statement of what the valley program is. It was proposed to publish a descriptive pamphlet in 1951 for popular use. Even the fiscal report, voluminous as it is, presents only an outline, many details of which require explanation by the particular agencies concerned. Various acts of Congress have authorized many parts of the program, but certain features have not yet received official sanction. The big plan of the Department of Agriculture has languished in congressional committees for a long time, awaiting action.

The biggest single authorization is that for the original Pick-Sloan plan.

What, then, makes up the Interagency program? In broad outline the following is a summary of its major features and of some of the incidental but desirable benefits contemplated:

FLOOD CONTROL

The aim is elimination of all imundations of any consequence. This applies to the Missouri River, especially in its lower reaches, and to many tributaries, including even Cherry Creek, Colorado, which has been dammed because it used to flood Denver. Some of the dams are mainly for flood control, which nearly all the others have as one of their multiple purposes. For the lower basin, where numerous floods, sometimes occurring every year or two as in the 1940's have caused heavy loss of life and huge property damage, the plan provides for a series of dams in several important tributary streams. These have yet to be started. It also calls for strong earthen levees in every one of the many stretches of low land on either side of the Missouri in the 760 miles from Sioux City to the mouth. These would protect 1,500,000 acres of fine agricultural bottoms. A start has been made on the levees, with 180 lineal miles of construction between Sioux City and Kansas City. Most of the dams remain to be built. Special protection works are in the plan for a number of large and small cities. Notable among these are systems of concrete flood walls and earthen levees in the low-lying but important industrial districts of the twin Kansas Citys and of Omaha and its neighbor, Council Bluffs. In approximately the first five

years of building, the Kansas City installation was somewhat more than half completed. The Army Engineers estimate that at least $10,000,000 in flood damages was averted in 1950 by works so far constructed. The Omaha district was protected from a serious flood that spring; so was Mandan, North Dakota, when the normally mild Heart River went on a rampage. The Army further claims that annual damages averaging $50,000,000 along the principal streams could be prevented eventually by the flood-control works. Some persons have suggested zoning as a means of keeping valuable private improvements from being installed on the flood plain.

IRRIGATION

Intentions of the Bureau of Reclamation as originally conceived were to bring 5,000,000 acres of dry land into the irrigation system and to provide additional water for 1,500,000 acres now insufficiently irrigated. In the meantime some findings have indicated that the acreages may be cut down or some of the locations shifted. The biggest areas in the original proposal for irrigation are: (1) northern North Dakota, adjacent to the Canadian border; this segment is outside the Missouri basin, being in the watershed of the Red River of the North, and Missouri River water would be pumped there over a low divide in the controversial Missouri-Souris Diversion scheme now pending; (2) eastern South Dakota, to be served from the Oahe Dam Reservoir; (3) northeastern Colorado, north of Denver, where additional water already is being brought in from the Colorado River through a tunnel deep under the

high Rocky Mountains. Although about two thirds of the Bureau of Reclamation dams have not yet been placed under construction, officials assert that all but two of the bureau's "key" control structures in the basin have been either contracted for or built. The exceptions are two proposed dams in Montana—Yellowtail, on the Big Horn River, just north of Wyoming, and Tiber, on the Marias River, just south of Alberta. In general, the bureau's dams are far smaller than those of the Army, not only because their basic purpose is different, but also because their sites often are in streams where less water would accumulate. Six years after enactment of the Pick-Sloan plan into law, only 2,300 acres covered by that scheme had been brought into irrigation, all in eastern Montana. Meanwhile, water was taken to an additional 35,000 acres in northern Wyoming on irrigation projects authorized prior to Pick-Sloan but subsequently treated as part of the Interagency program. As can readily be deduced, the road ahead for the irrigation job is long.

The mechanics of irrigation might make a long story in itself. Much of the water is moved by gravity flow, but there are important instances in the plan where water would be pumped uphill, as it were, to reach arid fields on higher levels. Indeed, bureau officials estimate that one third of all the electric power to be generated at Interagency dams would be used to pump water from streams or wells. Some of these generating facilities would be available only for seasonal power production in the irrigating periods, which are in the interval of about five months between spring and autumn; and their output of power would

be entirely consumed in this pumping process. Even where pumping is required, the main flow is by gravity. Districts served entirely by gravity may lie at appreciable heights above the streams supplying the water. This is possible because the water is tapped at some distance upstream and conducted to the scene of use down gentle grades, while the parallel river's natural fall is much sharper. Large-scale projects may take water from a penstock, or opening, in a multi-purpose dam, or they may be served by a diversion dam designed for this particular purpose. The water then moves, perhaps for miles, in canals and sometimes through concrete-lined tunnels beneath ridges or mountains. Laterals fan out from the main canals to reach all parts of the tract to be served. Lesser branches lead to the individual farms, the size of the channels steadily decreasing. Mere ditches supply the fields. Gates, valves, and other regulating devices control the flow, so that each farmer gets exactly what he is entitled to and no more; but when the fluid reaches the edge of the fields, it is up to the farmer to spread it over the ground. Time was, not so long ago, when that was a laborious, back-breaking job; men in hip boots toiled at the ditches to direct the flow with long-handled shovels. It is still a demanding task, but it has been greatly eased by use of plastic siphons, which suck water from the ditches to the land. Among the crops for which irrigation has proved especially suitable are alfalfa, sugar beets, beans, potatoes, small grains, pasture grasses, and garden stuff. The valley already has 5,000,000 irrigated acres, resulting from past public and private action, but only a little of which came under federal sponsorship.

ELECTRIC POWER

There has been almost constant revision of the figures both for the generating capacity to be installed at the dams and for the average annual output of electric power anticipated. The revision has tended generally upward for both. The latest available compilation, made jointly by the Federal Power Commission, the Army Engineers, and the Bureau of Reclamation, shows the total generating capacity that might be installed eventually as 3,191,065 kilowatts. That figure sounds large, yet it is only about two and one half times as big as the capacity of the private utility system serving the St. Louis metropolitan district. Furthermore, a considerable portion of this is not a "firm" or dependable all-year supply, being seasonal and dependent on the varying volume of water available in the reservoirs. Also, 54 per cent of this capacity would be in plants not yet built or started; 21 per cent of it has not even been authorized by Congress. The same compilation shows an ultimate average annual output from the entire system of 13,749,000,000 kilowatt hours of current. This relatively small figure in comparison with the generating capacity to be installed is owing to the expected seasonal character of operation.

Almost one half of all the generating capacity and of the anticipated output of power is concentrated in the Army's plan for six big dams on the Missouri River, mainly Fort Peck Dam and the three now under construction—Garrison, Oahe, and Fort Randall. The last three are designed as the biggest power stations in the entire basin program, with combined capacity of 1,145,000 kilowatts. The biggest power plant of the Bureau of Reclamation

would be at Yellowtail Dam, at this writing held up for a set of complicated reasons. That plant would be for 200,000 kilowatts. Only slightly more than that capacity is involved in eleven bureau installations now in use or under construction. One of these is Kortes Dam, on the North Platte River in Wyoming—the only project in the whole Interagency scheme designed frankly and purely for power production. This is a recently finished structure in a spectacular rocky gorge. Its capacity is rated at 36,000 kilowatts. Almost one third of all the anticipated power output would come from South Dakota. Next but in sharply descending order of volume, would be Montana, North Dakota, Colorado, and Wyoming. Nebraska would lag far behind in volume, and a rather negligible amount is figured on from some small streams in Missouri. The program contemplates no power plants in Kansas, Iowa, or Minnesota.

Whether steam-operated generating plants will be built as part of this public power system, to assure a firm or constant supply of electricity, is a wide-open question. There also is the continuing prospect that some day atomic energy will be used as fuel for electric generators.

The program provides for a grid of 8,000 miles of transmission lines crisscrossing the basin. So far, 2,200 miles of these have been put up or started, including some long routes. One of the big stretches is between Fort Peck and Garrison dams, about 250 miles. The transmission plan, comprehensive in nature, is designed to reach those customers for public power which are given preference under a well-established body of law: rural electric co-operatives, municipalities and other types of public distributors or consumers. As in every other part of the country, there has

been a series of bitter fights over the public transmission system with the private electric utilities and other believers in strictly private enterprise. The general notion of these opponents has been that it is all very well for Uncle Sam to erect the costly dams and generating plants, but that the private utilities ought to get the power at the source and handle all the distribution. Nevertheless, the plan for a public power grid in the basin is such that one irreverent engineer on a public payroll, who shall be nameless, remarked, in either jest or biting sarcasm: "In North Dakota and South Dakota the distributing system resembles a large fish net, with very little chance for a sucker to escape receiving government power."

AGRICULTURAL PLAN

This grand design is intended to hold the soil in place, reduce the flood-producing runoff of water, and improve the productivity of field and forest. It differs from the regular, accepted, nation-wide undertakings of the Department of Agriculture only in time, for the proposal is merely one of marked acceleration—the accomplishment in this region in thirty years of what otherwise would be expected to require a full century. The Department's voluminous report proposing the program has long since been laid before Congress, but what will become of it is problematical. The Interagency committee went on record publicly in favor of it some time ago, and there has been no reported outcry against it. It represents a staggering undertaking, however, and the temper of the times may keep its fate in doubt for a long period.

The agricultural program calls for a long list of specific measures for conservation and development of land, water, and forest resources. It also would play a part in flood control, but in a relatively limited way. It was designed with the intention of complementing the dams and related physical works being built by the Army Engineers and the Bureau of Reclamation. One of the objectives is to reduce the silt flow, and thereby prolong the useful life of the big reservoirs and reduce the damage caused by flood-borne sediment along the tributary streams. Another purpose is to enhance the ability of public and private forests to help maintain the water supply through proper handling of the forest growth. The outstanding objective is to hold the soil in place and thus to improve the productivity of the land. Mr. Young, the Department of Agriculture representative for the basin, has aptly described this program as the "grass-roots part" of the Interagency plan: it must be carried out field by field, creek by creek, mile by mile, by co-operative effort of farmers, ranchers, and state and federal agencies. Effects of the plan would reach most of the 582,000 farms and ranches covering 282,000,000 acres in the valley. Secretary of Agriculture Brannan has listed some outstanding features of the plan as follows:

Improved land management for a "large part" of the cropland throughout the basin.

Seeding of grass and legumes on 20,000,000 acres.

Provision of cover crops and green manure annually to protect 13,000,000 acres of now barren cropland.

Stubble-mulching treatment of 34,000,000 acres of grainland, a form of soil-working that reduces erosion.

Strip planting of crops and contour plowing, instead of the old "square farming," on 63,500,000 acres.

Shaping of 1,900,000 miles of terraces in fields to handle water.

Limitations on grazing and, in some areas, on grass and legume seeding, on 157,500,000 acres of privately owned range and pasture land.

Construction, improvement, and use of more than 500,000 new stock ponds, 30,000 springs and seeps, and 78,000 wells.

Protection of grazing land with 166,000 miles of fire guards (trenches), 65,000 miles of new fencing, and 2,000 miles of new cattle trails.

Tree planting on 5,000,000 acres of forests, and reseeding of 400,000 acres of forest range, also various protections against fire.

Planting of more than 2,500,000 acres of shelter-belts (groves of trees in long strips) and windbreaks.

Building from 14,000 to 16,000 small upstream dams and 400 to 600 desilting and debris basins. These would give temporary storage for 4,800,000 acre-feet of water.

Constructing 4,500 to 5,500 miles of minor floodways, 10,000 to 12,000 miles of channel improvements on small streams, and 60,000 to 70,000 miles of diversion ditches and dikes.

Drainage of wet land.

Various aids to irrigation.

Help in developing rural electrification.

Soil surveys; research work; other scientific aids.

Extension education to help farmers and ranchers understand and handle the program; also, augmented rural credit provisions, to help finance the big private share of the job.

Mr. Young has reported that agricultural production in the Missouri Valley would be increased by $660,000,000 annually under the agricultural program. This estimate contemplates a 30 per cent increase in productivity of crop and pasture lands.

When the program was made public, Secretary Brannan declared: "There is no magic and no wizardry in this effort. It proposes to strive towards what nature, under the most ideal conditions, does to replenish and strengthen renewable resources." The Department disclaims the idea that soil control alone would stop floods, but insists that it would help, especially in smaller tributary watersheds, where much of the damages occur.

NAVIGATION

The Interagency plan, taking on a project that antedates it by some years, provides for a nine-foot navigable channel for the entire 760 miles between the confluence of the Mississippi and Missouri rivers and Sioux City, Iowa. The scheduled completion date is 1954. The plan presents the possibility of an upstream extension of 896 miles, from Sioux City to Williston, in the northwestern corner of North Dakota. Williston, at the head of the maximum reservoir that could be created by Garrison Dam, is the last town of importance feasible to reach by boat. Beyond it lies Fort Peck Reservoir and vast open country in Montana. To move from Sioux City to Williston, water-borne traffic would traverse five prospective reservoirs and pass five high dams by means of series of locks, or possibly canals, or maybe even marine railways. The total length of possible navigation envisioned is 1,656 miles, from the mouth of the Missouri to Williston.

Enforced neglect of river and channel work during World War II, coupled with rising costs since then, and

aggravated by several severe floods and ice runs, played havoc with the navigation facility. General Sturgis, former Missouri River engineer for the Army, conceded recently: "In places the river has reverted to its former wild state." Nevertheless, within five years after the war the nine-foot channel downstream from Sioux City was reported about three quarters attained. Elsewhere in this sector there are sandbars and shoals and other obstructions. The channel has been fairly well established below Kansas City, and the Inland Waterways Corporation, a government agency, familiarly known as Federal Barge Lines, has been giving service between St. Louis and Kansas City. Attempts to operate as far upstream as Omaha have not been so successful, but the barges make it from time to time. The barge line has abandoned its Omaha office. One peculiar difficulty encountered at times of high water is the inability to pass a railroad swing bridge at Leavenworth, Kansas: the effect of water and silt swirling around the exposed mechanism of the swing span is said to make it impracticable to open the bridge for boats. In spite of the difficulties and the delays in completing the river work, the Army Engineers have reported some encouraging increases in barge traffic. The volume still is not large. One interesting regular shipment of late has been about 3,000 tons of steel monthly, reaching Omaha from the Ruhr Valley of Germany, by way of ocean vessels to New Orleans and barges up the Mississippi and the Missouri. The present navigation season for the Missouri extends from about May 1 to November 15. If navigation should be extended across the Dakotas, the season there might be shorter because of the long, severe winters.

BANK STABILIZATION

An incidental but highly important effect of the navigation improvements on the river is that of protecting and stabilizing the banks. It is estimated by the Army Engineers that such protection is preserving hundreds of thousands of acres of bottomland along the lower river. The Army believes that the benefit from this already amounts to many millions of dollars. When the channel is pegged in place, the current stops chewing away the banks. You can see along the stream countless places where rich farmland is safe from this erosion, places where not so many years before the war it was a common experience at times of high water to see huge chunks of ground, literally acres in a day, cut away.

General Sturgis asserted: "The benefits from this protection to the river bottom of the main valley more than equal the entire amount spent on the river channel."

Bank stabilization is a prerequisite to construction of the flood-control levees.

OTHER FEATURES

The Interagency plan also includes these things:

Fostering of development of the vast latent mineral resources.

Groundwork activities for inducing industrial development.

Promotion of fish and wildlife, particularly in and around the numerous reservoirs. Already the completed reservoirs have attracted many anglers.

Provision of recreational facilities in and near the reser-

voirs. These big man-made lakes attract vacationers and day visitors, and are welcome places for boating in a region to which that sport is new.

Augmenting the water supply for domestic and industrial consumption and for sanitary flow in the streams, and abatement of stream pollution.

Extensive surveys of the land; new mapping; soil classification; and various other projects for basic information.

Studies of the life of ancient and prehistoric man. The deep digging into the earth for the dams has provided a remarkable opportunity for the archæologists and paleontologists to search with relative ease for evidences of mankind in past geological eras.

CHAPTER XI

Dams and Diversions on the Grand Scale

A DAM is a dam is a dam, you might think, especially when dams come in scores, as they do in the Missouri River watershed. The fact is, however, that these big, inanimate structures have individual personalities; at least they seem to have, in the minds of dam connoisseurs. Definitely they possess marked engineering and structural differences; designs vary considerably because the terrific force of water acts differently under differing circumstances. Although most of the locations are in the plains country rather than in the mountains, there is a surprising variation in settings and the character of surroundings. One thing the dams have in common is the utilization of some sort of gorge for each site. The gorge can be between mountain-like walls, but frequently it is a natural cut worn through the billowing earth in the course of geological time. The very earth is a problem, for it frequently takes the form of clays, shales, or chalks in which it is no easy engineering task to locate and anchor a ponderous dam.

Many of the Interagency dams are, or will be, constructed of earth, rolled up by machine in vast volume from the immediate surroundings, carefully compacted, and then faced with heavy stones piled without mortar. This is a departure from the common public conception of a dam as a thing of concrete or masonry. In a country-

side where the length of a dam may have to be anywhere from half a mile to more than two miles, earth is the only logical material. Concrete is used only for the powerhouses, the normal water outlets, and the flood spillways, which themselves are major items of construction. Compacting into a solid mass of the earth loosened by the gigantic modern machines employed to cut and move it is effected by careful rolling, plus settling under temporary ponds. Much of the rolling is done by prong-studded steel drums, called from their appearance sheep's-foot rollers. It is a passing note of irony that hoofs of sheep can cut the range lands and their mechanical counterparts help make the dams designed to develop the region.

Fort Peck Dam, four miles long, was built by a different method: that of the hydraulic fill, consisting of earth thrown up by dredges operating in the river. This proved unsatisfactory for structural stability, and the weight of engineering opinion now favors the rolled-earth method.

Only superlatives and jumbo figures serve to describe the outstanding projects of the Interagency plan. Take, as a prime example, Garrison Dam: it will be the world's largest earthen dam, forming the world's largest water reservoir. It is the biggest single Interagency undertaking. Begun in 1946, it will not be completed until 1955. The volume of all excavation will be 86,000,000 cubic yards (130,000,000 tons) of earth, rock, lignite, and miscellaneous materials. In contrast, the basement excavation for a residence of fair size may be about 250 cubic yards. The dam itself will be formed of 70,000,000 cubic yards of earth. General Sturgis has pointed out that this volume is twenty-five times that of the Great Pyramid of Egypt,

but that the dam is being built in nine years, whereas erection of the pyramid was spread over entire dynasties. The contractor for one phase of this dam had an investment of $2,200,000 in sixty monster earth-hauling machines drawn by tractors of almost unbelievable strength. Each unit hauled forty-five tons of earth at a fast pace. Not content with that, the contractor experimented with trailers holding thirty-seven tons, but the rough terrain was difficult for that added burden.

The site is in the midst of a broad expanse of bounding plains, a dusty, wind-swept district of dry farming for wheat and of livestock grazing. The eroded river gorge has some green and fertile fields and numerous cottonwood trees. The first job of the Army Engineers, who build their projects by employing contractors, was to get a railroad spur and a blacktop macadam road laid to reach the place from the Soo Line and U.S. Highway 83, which are ten miles east. The dam was named for Garrison, a town of 1,900 population ten miles north. It was located at a spot where the flow of the river has been known to range from 40,000 to 275,000 cubic feet per second. A new city, Riverdale, had to be built on the plateau at the scene of action, for several thousand workmen have been swarming over the job at times. Work usually has proceeded in two long shifts daily, with batteries of floodlights at night, during the average construction season of seven months. The handling of earth and concrete is impossible during the other five months, the winters being too long and severe. It is hard to realize unless you see for yourself, but down in the river gorge above and below the dam a stranger can get lost in the maze of dusty work roads. The contractors

have even installed electric traffic signals at some hazardous points. A temporary bridge a quarter of a mile long crosses the river to serve only the builders. Another steel bridge, reaching high in the air, had to be thrown up temporarily to hold big revolving cranes employed on the intake structure.

The dam, which is slowly taking shape over the years, will be 12,000 feet (two and one quarter miles) in length. It will rise 210 feet above the river bed. In cross-section its shape is triangular except for a somewhat flattened apex. The base will be 2,600 feet (approximately half a mile) in width, measured in the direction of stream flow; the top will be 60 feet wide, with space for a public highway. Buried within the dam will be a core of sheet steel piling to give added strength.

There will be a concrete spillway 3,300 feet long set in a deep notch cut through the bank on the eastern (Riverdale) side of the site. This is a safety factor for time of flood, to permit the automatic escape of excess water in the rare event of such need. A channel two miles long will be dug to lead from the spillway back to the natural river downstream.

Normally water will move out of the reservoir through eight tunnels, each of which is more than big enough to permit passage of a railroad train. Their diameters vary from 22 to 29 feet; their length is about one quarter of a mile, being in a narrowed neck on the hillside at the western end of the dam. Three of the tunnels are for ordinary regulation of the river flow for downstream needs. The water will rush through them at a speed of about 100 miles per hour. The other five tubes will serve the powerhouse,

one tunnel for each 80,000-kilowatt generating unit. Resistance of the heavy turbines will slow the water movement in these outlets to a mere 11 miles per hour. The flow will strike the ring of blades or paddles that form the turbine and will make that machine revolve on its fat, shiny, vertical shaft. The shaft will cause the generator to spin rapidly, and, lo! current will flow through thick wires strung across the lonely plains. On the upstream side of the dam the intake works, where use of the tunnels will be controlled, will rise 259 feet, or about as high as the tower of the state Capitol, seventy-five miles southeast at Bismarck. Across the bottomland west of the present course of the river a long, curving channel has been dug to guide water into the intake when the time comes. A similar but shorter channel will be dug for a downstream outlet. To achieve the freest flow with minimum turbulence in this outlet, studies were made on a scale model at the laboratory of the Army Engineers at Vicksburg, Mississippi.

The ground at the site of the tunnels is a sort of crumbling clay known to geologists as Fort Union shale, the same sort of soft but impervious or moisture-proof material found in the badlands of western North Dakota. The engineers found no past experience with heavy construction in this rather tricky stuff. They therefore began one of the tunnels as quickly as possible in 1949, for test purposes. They wanted to know what would happen to the circular tube as huge quantities of earth were piled above it as part of the dam; how heavy the steel ribs reinforcing the lining should be; and also the structural effect when the other tunnels were bored in close proximity. One notable result of this test was a reduction in weight of the steel ribbing

for the eight units from 22,000 tons to 11,000 tons, at a saving of almost $3,000,000, because it was found the soil conditions demanded less reinforcement of the tunnel than expected at first.

Although Garrison Dam is essentially an earthen structure, the spillway, intake works, and powerhouse will require 2,000,000 cubic yards of concrete. The engineers say this volume of concrete is exceeded by that of only three all-concrete dams in the world (always excepting the possibility that the Russians may claim something bigger). Considerable heat is generated in the mixing of concrete, and there also are difficulties with mixture in chilly weather. Accordingly, the contractors have adopted the device of injecting either ice or heated air into the materials, as the need may be.

This dam is at the funnel point of a drainage area of about 180,000 square miles, somewhat more than one third of the Missouri basin. The structure will be closed off in 1954, according to present schedule, so that the reservoir will start filling then. Two to five years may be required to complete the filling, the engineers believe; the time depends on what nature provides in the way of rainfall and snowfall upstream. If, as, and when the reservoir is filled to maximum capacity, it will hold 23,000,000 acre-feet of water, or more than one fifth of the storage capacity of the entire system of Army and Reclamation dams planned for the basin. At the maximum, the reservoir will be 200 miles long, more than 14 miles wide at some places, and more than 200 feet deep in spots, and will have a surface of 609 square miles and a shore line of 1,500 miles. An Army leaflet figures the maximum contents as a mite less than seven and one half

trillion gallons of water. At anticipated minimum stage, the reservoir will shrink to a length of 120 miles and a surface area of 208 square miles, with width and depth diminishing in proportion.

The storage capacity of the reservoir is divided into three levels. At the bottom there will be 4,900,000 acre-feet for "dead storage" below the level of the normal outlets. This portion helps create the "head" or height needed for effective power production; it also is the huge space set aside for accumulation of the silt that will pour down in decades to come unless the soil-control movement succeeds in abating this waste. The next level up is 13,850,000 acre-feet, designated for "multiple-purpose uses." This is the storage for power, for whatever irrigation may be achieved in this project, for aid to navigation in the lower Missouri and the Mississippi, for improved municipal water supplies in parts of North Dakota, for recreational use, and for wildlife and fish conservation. Space at the topmost level, 4,250,000 acre-feet, is reserved for flood control; there excess waters can be stored to protect areas down the valley. A question not likely to be settled to universal satisfaction for some time to come is whether use of the great reservoir for all these intended purposes will be feasible. One of the doubts is over the practicability of extensive irrigation. The Interagency scheme contemplates that Fort Peck Dam, the next barrier upstream, which was built with navigation and flood control as objectives, will be converted to emphasize irrigation and power after Garrison Dam goes into service. The Army Engineers originally proposed Garrison Dam mainly as a flood-control device, from which, however, a water supply could be diverted to eastern North Dakota.

The original Sloan plan of the Bureau of Reclamation did not contemplate the construction of Garrison Dam. This project was made part of the Pick-Sloan plan two months before enactment of that plan into law.

Thereafter for several years a lively controversy ensued over the height—and therefore the size—of the Garrison Reservoir. Local interests, led by some persons from Williston, the town at the upper end of the 200-mile maximum pool, succeeded for a time in having a limitation written into the appropriation acts for this project. The dam was designed, and is being built, to provide for maximum elevation of the reservoir at 1,850 feet above sea level. The limitation provided that the pool could not be filled to an elevation higher than 1,830 feet. This vertical difference of only twenty feet might at first glance seem small. The Army declared the effect, however, would be to reduce the storage capacity to 16,200,000 acre-feet, a cut of thirty per cent; to shorten the length by twenty-five miles; markedly to reduce power production; and to jeopardize the chances of irrigation. One of the relatively few formal decisions by the Missouri Basin Interagency Committee was made in August 1945 when it voted in support of the Army's 1,850-foot elevation. The controversy dragged on in spite of this, and in June 1949 the co-authors of Pick-Sloan had an open disagreement over it before a congressional committee at Washington. General Pick argued for 1,850 feet, while Mr. Sloan spoke for 1,830 feet unless studies showed that the pool should be higher. The exchange, as reported in a press-service dispatch, was acrimonious. A repercussion not long afterwards was an unsuccessful effort to prevent the re-election of Mr. Sloan as Interagency's chairman. Eventually

the opposition to the pool height dwindled and the congressional limitation was knocked out.

Power production of Garrison would be enough for a good-sized city's normal needs. The output will be fed into the basin-wide electric grid. The average annual volume after all five generators are in use is estimated at 900,000,000 kilowatt hours of firm, or dependable, power, and 812,000,000 kilowatt hours of non-firm, or interruptible, power, a total of 1,712,000,000 kilowatt hours.

The town of Riverdale, credited in the 1950 census with population of 2,551, has been said by the Army to have been appreciably larger than that at times. Once the construction period ends, the permanent population of dam-operating employees and their families is expected to be only a few hundred. The permanent houses are of attractive design and reasonably good construction. Temporary houses are frame and have somewhat the appearance of barracks. The layout of the town is good, a pleasant spot perhaps fifty feet above the maximum reservoir height having been chosen for it. Uncle Sam is the sole landlord and also the town government through the medium of the Corps of Engineers. A commissioned officer of the Engineers is the town manager, and the corps employs a civilian police force. Facilities include a school, a church, a movie theater, stores, a hotel, a central heating system, a hospital, a jail, offices of the Garrison Engineer District, a telephone exchange, and a post office. There is bus service to Bismarck and Minot. No alcoholic drink except beer by the case is sold in the town. When an effort was made to start commercialized gambling down the road a little way, the state stepped in and stopped it.

The cost of Garrison Dam? Oh, yes, the cost! In 1945, as World War II ended and preparations were made to start building the dam, the cost estimate was $123,400,000. By 1949 this had risen to $188,000,000. In the autumn of 1950 the guess was $202,000,000. By June 1951 the figure had soared to $268,000,000. This steady revision upward was caused by inflation, not by any important change in plans. What the final figure will be by the time the job is done in 1955 is anybody's guess.

An amazing feature of the Interagency program is a series of projects spread out for more than 500 miles across Montana and North Dakota and tied together as the Missouri-Souris Diversion. This would take as much as three quarters of the flow of the Missouri River at a point just below Fort Peck Dam, in Montana, and pump it over a low divide into the basin of the Red River of the North, which is tributary to Hudson Bay. A fraction of this water would be turned back into the Missouri in eastern South Dakota, and some would augment the flow of the Red River just about as far north as the border of Manitoba. Bruce Johnson, district manager of the Bureau of Reclamation, sponsor of the project, says that this diversion would be "the greatest man-made water system of all time." Naturally a scheme on such a grand scale is controversial, and some serious doubts have been raised whether it can be carried out as a whole. The project has been termed Mr. Sloan's brain child. Eloquently raised eyebrows of Army engineering officers and some other officials convey the idea that enthusiasm for the plan is not universal, but the areas that would benefit from it of course are its strong sup-

11. (a) *A modern conservation farm (right) contrasted with an old-fashioned "square" farm in eastern South Dakota.*
Paul Berg, *St. Louis Post-Dispatch* Pictures.

(b) *Bridge washed out by the great 1947 flood of the Nishnabotna River, near Hastings, Iowa, which also chewed off large pieces of the fertile fields.* Corps of Engineers.

12. *The Capitol, Bismarck, North Dakota.*
W. P. Sebens, Greater North Dakota Association.

porters. The Army Engineers have favored a lesser diversion from Garrison Dam.

The Souris River is a minor stream that comes out of Saskatchewan, bends through North Dakota, and returns to Manitoba. The diversion from the Missouri would connect with the Souris. A relatively small dam in the Missouri would draw water into a 95-mile canal leading to Medicine Lake Reservoir. That pool would hold 5,200,000 acre-feet, or more than a quarter of the capacity of Fort Peck Reservoir. It would be formed by a mile-long dam across Big Muddy Creek, in eastern Montana. The Medicine Lake impoundment would be directed to Grenora, just across the line in North Dakota, where electrically driven pumps would raise the water 90 feet to cross the divide. The next step would be a move through the proposed Souris Canal, 130 miles long, from the eastern end of which the water would fall 158 feet in a penstock. At this point it would back up the little Riviere des Lacs behind a low dam for a distance of 25 miles to the Saskatchewan border. Immediately south of the international boundary this pool would supply an extensive system of main irrigation canals. Along the eastern side of this broad irrigation area and inside the United States loop of the Souris, a 50-mile collection canal would gather drainage from the irrigated lands so that it would not find its way by natural courses into the Souris and thence into Canada. Behind the protection of a diversion dam in the Souris the water from the collection canal would be guided across that stream and into another artificial channel, the 35-mile Devils Lake Canal.

This canal would lead into a so-called regulating reser-

voir, 60 miles long, in the Sheyenne River. (That eastern North Dakota tributary of the Red River is not to be confused with the Cheyenne River of western South Dakota.) The regulating pool would control water supplies for the Sheyenne, whose mouth is at the Minnesota line near Fargo, North Dakota; for the James River, which enters the Missouri in South Dakota; and for Devils Lake. The augmented flow in the Sheyenne would provide eagerly awaited supplies for industrial and domestic use for Valley City, Fargo, and Grand Forks, North Dakota; Fargo's neighbor, Moorhead, Minnesota; and fifteen smaller towns. The Sheyenne Reservoir would be high enough to enable a flow back over the divide into a 12-mile canal leading southward to the James River in the Missouri basin. Jamestown Dam would be built in the James, forming a 45-mile reservoir in North Dakota reaching upstream to this canal. The Jamestown Reservoir would be for irrigation. Northward from Sheyenne Dam, another canal, 10 miles long, would lead to Devils Lake, once an attractive body of water, but now shrunk to a salty pond. The level of this lake dropped forty feet in a recent forty-year period. One purpose of the Missouri-Souris Diversion is to restore Devils Lake with water from far-away Fort Peck Reservoir. Outfall water from Devils Lake would find its way back into the Sheyenne below Sheyenne Dam.

Calculations by the Bureau of Reclamation a few years ago showed that the diversion of water from the Missouri would be 3,300,000 acre-feet annually, 75 per cent of the average annual flow of the Missouri at that point for 1930–40, or 43 per cent of the average annual flow for 1880–1945. Somewhat less than half the diverted water

would go for irrigation. The rest would be dissipated by evaporation and seepage, except for 350,000 to 500,000 acre-feet that would return to the Missouri via the James. The scheme contemplated irrigation of more than 1,100,000 acres of land in North Dakota, 160,000 acres in Montana, and a small acreage in South Dakota.

This far-flung project speedily ran into difficulties. While it was still new, the *Kansas City Star*, an ardent supporter in general of the existing plans for the basin, opposed the Missouri-Souris Diversion, particularly because it feared a harmful effect on the supply of water for downstream navigation in the Missouri. A question quickly arose whether the diversion could be carried out without the consent of the Montana Legislature—which might not be forthcoming—as a Montana law prohibits appropriation, impoundment, or diversion of Montana water for use in other states. The statute stands, but officials of North Dakota and of the Bureau of Reclamation have asserted that a way could be found to go ahead with the plan anyway under "paramount" federal authority. A sharp argument arose quickly over the relative desirability of Sheyenne Dam and Bald Hill Dam, a project of the Army Engineers 70 miles downstream on the Sheyenne River. Bald Hill Dam is an independent feature, not directly part of the Interagency program and under the jurisdiction of a different division of the Army Engineers, yet frequently considered as a sort of cousin of the Interagency family. Congressional provisions for the Bald Hill job required the cities and towns desiring more water to contribute $208,000 for the site of that reservoir. The Bureau of Reclamation arrangements held no such requirement for Sheyenne Dam, but were predicated

on eventual payments by the municipalities for water supplied them. The Army said Bald Hill Dam could control a greater volume of water than Sheyenne Dam and could operate by itself, whereas the bureau's dam depended on the whole Souris Diversion plan. The Interagency committee, in another of its few formal actions, put it up to the people of the cities and towns concerned. The people, doubtless thinking of the "bird in the hand" adage, chose Bald Hill and paid their share of the cost. The Army went ahead and built Bald Hill Dam, which will provide 70,000 acre-feet of storage and might be of some help in flood control.

The Bureau of Reclamation received some relatively small appropriations for construction of the Missouri River Diversion dam and for investigations on the North Dakota aspects. It made plans for this dam, but then decided to look into possibilities of hydroelectric power production if the dam site were shifted somewhat farther downstream. One well-informed official snorted, in a private conversation: "They've spent a lot of money and have a plan for a diversion dam and now are figuring on another one instead, with power, but they wouldn't get much power. What's the use?" Indications were that whatever power might be produced would be in small amount, with the prospect of only periodic or seasonal operation.

What appears to be the worst blow at the Missouri-Souris plan came to public attention a full decade after the early discussions of the idea, and after considerable investigation and other work, involving at least $2,500,000 in preliminary expenditures. This was the disclosure that much of the North Dakota land it was intended to irrigate was not suitable for irrigation. Nevertheless, Mr. Sloan and

his supporters retained faith in the project, buoying their hope that it might be brought to realization eventually in some form. But a detailed report on land conditions given Interagency in October 1950 by Dean H. L. Walster of North Dakota Agricultural College seemed to blow the kiss of death at Missouri-Souris.

Dean Walster showed that large areas of the Souris Valley in northwestern North Dakota have a soil of glacial origin and of a character barring proper drainage—good drainage being an essential of successful irrigation. Where drainage is poor, it permits, among other things, creation of swamps or the rise to the soil surface of alkaline substance that turns fields into spotted deserts. Mr. Walster declared that 500,000 acres of land in that district might as well be written off as useless for irrigation. This is almost half of the total irrigation plan for North Dakota, and compares with present irrigation of only 20,000 acres throughout that state. The findings, which had gained currency among various agencies before they were made public, set the Bureau of Reclamation and other public organizations off on a search for substitute areas. That inquiry, which will take some time to complete, is leading the soil specialists across a broad band of territory, containing perhaps from 4,000,000 to 5,000,000 acres, extending all the way to the southeastern corner of North Dakota. Although advocates of the original Souris Diversion plan will not agree that it has been proved unworkable, geographic and other physical reasons, bolstered perhaps by the interplay of the bureaucratic process, make it seem likely that any new location to replace the 500,000 challenged acres might be served by water from Garrison Reservoir. By the same reasoning, an-

other 500,000 acres in the Souris River loop might be dropped out of the plan, if for no other reason than that the costly diversion would not be justified to serve them. A small diversion might be carried out in Montana for irrigation within that state. The fight is not over yet and probably will not be for some time. The Bureau of Reclamation thinks that it will be 1953 before it can report on a new plan, assuming it gets the desired funds for the inquiry.

Some persons questioned whether irrigation was workable in the rigorous climate of northern North Dakota, but the Bureau of Reclamation declared that irrigated farms had been successful in a still colder climate in Alberta. A hurdle to be encountered eventually in the irrigation plan is to get farmers and ranchers to sign up for the water if and when it is offered them. Incidentally, it should be noted that the Missouri-Souris Diversion plan calls for slightly more than one-fourth of all the new irrigation proposed in the Interagency program.

The cost of this diversion has not yet been mentioned here. When the Souris scheme was new, in 1940, the estimate was $137,000,000. By 1949 the figure was $423,000,000, with some hope of finding a means of making a sharp cut. The next year there was less effort to be specific, and the broad range of from $400,000,000 to $500,000,000 was stated officially. Like the price of Garrison Dam, that of Souris might be even greater by the time the project could be carried out.

Another and more spectacular diversion of water, but in a much more concentrated area, is being carried out in the Interagency program, and is approaching completion. This is the Colorado-Big Thompson Diversion, which is bringing

water under one of the most rugged ranges of the Rocky Mountains from the Colorado River to supplement the inadequate irrigation supply in northeastern Colorado. Snowfall and rainfall on the eastern slope of the Rockies are lighter than to the west. The Big T project, as it is nicknamed, also is producing hydroelectric power. It is one of the undertakings adopted into the Interagency family, having been authorized independently back in 1937. A news article in the *St. Louis Post-Dispatch* said:

"The rocky face of Colorado is being made over by the Bureau of Reclamation in the Colorado–Big Thompson Diversion. Here are man-made lakes big enough to excite awe in a region of shining ponds and tumbling streams; here are dams large enough to be noticed among peaks and ranges more than two miles high. Here also are tunnels, concrete conduits, fat metal penstocks, canals, siphons, and miscellaneous odd structures dotting the incomparable landscape. This work of man does not seem to clash with the age-old scenery. . . . Work on the project can be seen scattered over a stretch of more than 200 miles, from the western slope of the Continental Divide to the plains of northeastern Colorado, which bloom fruitfully wherever water can be turned on them. It is in the high mountains that the most spectacular jobs have been done."

Most of the installations are in and near Rocky Mountain National Park, in the vicinity of two popular resort centers, Estes Park and Grand Lake. A big storage pool, Granby Reservoir, was built in a mountain valley to impound Colorado River water. Flow of that stream below the dam is maintained by a tunnel through a mountain arm and leading into a canyon. Electric pumps will lift the water

181 feet from Granby to Shadow Mountain Lake, an artificial addition to Grand Lake. This lift was necessary because there was no place for a sufficiently large reservoir at a higher level. One of the first features completed was a 13-mile tunnel that carries the water from the Grand-Shadow combination to the watershed of the Big Thompson River on the Missouri basin side of the divide. The circular, concrete-lined tunnel is big enough to drive a truck through. It starts at Grand Lake at an elevation of 8,367 feet above sea level and drops on a gentle grade, some 3,700 feet below the crest of the divide. The route is directly beneath the impressive Front Range of the snow-clad Rockies, northwest of Longs Peak.

The scattered installations are too numerous to describe in detail. Among them are powerhouses, electric substations, and a big start on an 1,100-mile system of transmission lines. A set of heavily insulated power cables, encased in a pipe in which constant pressure is maintained, has been suspended from the top of the tunnel. This million-dollar job was cheaper than an overland transmission line, and also avoided marring the scenery. The resort town of Estes Park has been enhanced by creation of Lake Estes in the Big Thompson River. Horsetooth Reservoir has been built in the foothills west of Fort Collins; it required not only one big dam to plug a mountainous valley, but three smaller ones blocking off side canyons. The Blue River has been dammed, over on the western slope of the divide, to provide for a picturesque power plant at an out-of-the-way spot.

Irrigation benefits of the Big T will be spread over 615,000 acres of land in a conservancy district organized under state law. The district embraces a large piedmont area, plus

a long, curving strip following the valley of the South Platte River right to the Nebraska border. General Pick once inquired whether water supplied by the Big T could be used to augment flows of the South Platte in Nebraska. Regional Director Avery A. Batson of the Bureau of Reclamation replied emphatically that this would violate an interstate water compact and jealously guarded states' rights in water. The general continued, in seemingly simulated innocence, by asking whether it would be possible to prevent the flow of the Big T's part of the South Platte water from getting out of Colorado. Mr. Batson replied: "That's a good question, but I can't answer it."

Such critics as James G. Patton, president of the National Farmers' Union, and Leslie A. Miller, natural-resources task-force chairman of the Hoover Commission on Governmental Reorganization, have needled the Bureau of Reclamation over the big increase in costs of the Big T. This situation led William Blair of the *New York Times* to label the project the "Big Trouble." When the Big T was authorized by Congress in 1937, the cost was estimated at less than $44,000,000. By February 1946 it had increased to more than $96,000,000, and six months later was reportedly placed at $110,000,000. The following year it was more than $128,000,000; in 1949 it was $141,000,000; and the bureau announced it would approach $145,000,000 by 1950. With some work yet to be done, the end of this spiral obviously has not been reached. In the case of the Big T it was not inflation alone that swelled the price, for there were some engineering changes and additions of importance. The bureau says that these included an enlarged supply of firm electric power and more transmission lines.

Unlike the swollen costs of some irrigation projects, these cannot be charged against the irrigated land, for the conservancy district has an ironclad contract with the bureau, dating from 1938. In this contract the district agreed to pay up to one half the investment cost in Big T—but not more than $25,000,000. The bureau in 1946 went around to the district's board, which is headed by Charles Hansen, publisher of the *Greeley Tribune*, and sought to talk the district into shouldering some of the increase. The answer was a polite but firm no. The district already had most of the annual water supply allocated among farmers at a fixed price of $1.50 per acre-foot, and the directors could not imagine the farmers agreeing to pay any more. Besides this charge to the farmers, the district has a unique arrangement to meet a large fraction of the water cost by an *ad valorem* tax on all property in the district, including the real estate of the cities and towns, on the theory that everybody benefits.

The Colorado-Big Thompson Diversion is a *fait accompli*. Pending in the Interagency program is another tramontane importation of water on a far bigger scale. This is the Blue and South Platte Diversion, proposed by the Bureau of Reclamation to bring water from the Blue River, a tributary of the Colorado, to the north fork of the South Platte River. There would be a tunnel more than 18 miles long beneath the Continental Divide, with its eastern terminus south of Mount Evans. Its purposes are irrigation, hydroelectric power, and a large increase in the supply of water for the city of Denver. Completion of this project is calculated to take twenty-two years, but it is problematical when or if it will get started. It might be given a boost by

the need for electric power and of more water for Denver. As of 1949, the cost was estimated at almost $404,000,000.

Readers will have perceived that neither the ideas, the plans, the money figures, nor the problems are small in this Interagency program. Like almost everything else about the Missouri basin, they are big and tough.

CHAPTER XII

Problems in Profusion

IT CAN scarcely be cause for amazement to find that a multi-billion-dollar undertaking spread across a sixth of the nation is beset with problems. Only the contrary would be astonishing. The basic problems are planning and management. Unfortunately, they have become confused with fundamental political and economic philosophies and policies in the Missouri basin. That conflict of course is part of a national question, for it has arisen in every other region. Almost every problem in the Missouri watershed is perforce controversial, none more so than the basic one of planning and management. There are several earnest schools of thought on this, and if you listen to the advocates of any one of these schools, you may get the impression that it alone offers the salvation of the valley.

The fact is that some of the strongest supporters of the Interagency plan and, in general, of the present method of procedure are aware of some shortcomings in the existing arrangement. They have been arguing publicly for modifications and for changes in the underlying control. There is less tendency among proponents of other ideas—notably among those favoring a Missouri Valley Authority (MVA)—to concede that their system might have faults or problems. The MVA will be discussed in the ensuing chapter,

and the matters of planning and management will be taken up as part of the concluding chapter.

Other problems of this valley of contradictions are related in the main to specific aspects. One thing they have in common is the serious impact of the national inflation of money. Not only has the cost of the projects risen sharply from the grand scale on which the plan was launched, but also this rise threatens to upset the financial justification and feasibility of some of the undertakings. A summary of facts about some of the specific problems follows:

PROVINCIAL STATUS

This region processes very little of its own products. An old and valid complaint is that the wheat goes to Minneapolis in bulk and is shipped back as flour; the lumber goes to Grand Rapids and returns as furniture; the raw wool, laden with dirt and grease, goes to New England and comes back as suits or blankets; and the hides go east and return as shoes. All this entails a double charge for transport, including the unproductive expense of shipping the waste part of the raw materials on the outward trip. And freight rates to and from the greater part of this region are relatively high, one explanation being the long haul involved. The freight rates on manufactured products for the eastern part of this basin are 46 per cent higher than for the northeastern United States, while for the western part of the basin they are 71 per cent higher. The situation is complicated by lack of labor to handle local processing of raw materials and by the thin population—that is, the lack of local consumers of goods. A recent ICC order may cut freight rates.

The character of landownership also is a factor. Throughout much of the valley, land is held in large tracts, unlike the farms of "family size" familiar in many other sections of the United States. This tends to prevent the fostering of localized community interests. It is not absentee landlordism in the sense of the old English ownership of Irish farms, but it cannot help tending toward a provincial status. To some extent, especially in the big grazing and wheat districts, there is corporate ownership of the land, a condition accentuating this status.

There is heavy emphasis on east-west lines for all forms of communication in the valley. It appears in the railroads, the highways, the air lines, and even the telegraph and telephone channels. This is particularly true in the broad northern sector, the Dakotas and Montana, where all communications are funneled out of the basin and into the twin cities of St. Paul and Minneapolis. A band to the south leads to Chicago. Kansas City and Omaha are relatively less important terminals of Missouri basin communications. Paradoxically, the Missouri River itself is the chief artery following an essentially diagonal line across the region.

A Minneapolis editor has stated that two large banking chains in his city control many of the banks in North Dakota, South Dakota, and Montana. The implications as to status of the region are obvious.

SUFFICIENCY OF WATER

Whether or not there is enough water in the Missouri River system to meet all the demands is a battle of statistics and opinions. This has been going on for several years and quite

likely may continue until actual experience proves one side or the other correct. Figures fly back and forth in terms of millions of acre-feet. To an impartial observer, the big trouble seems to be that records of stream flow in the past are not sufficiently extensive to give a foolproof, dependable answer. Each side of the argument has used the available data in good faith to its own satisfaction. The question is of utmost importance, for if there is not enough water some of the intended uses under the Interagency program may suffer. The flow in the Missouri necessary to maintain a downstream navigation channel might be curtailed or even cut off at times. The water supply for power generation might be restricted. The supply for domestic, industrial, and sanitary use in the more populous eastern part of the watershed, east of the ninety-eighth meridian, could be endangered. Under both federal and state laws, the water for irrigation and other "beneficial, consumptive use" is protected in the western part.

Interagency's stand is that there is sufficient water for all purposes—with the qualification that the navigation season might have to be shortened in periods of prolonged drought. It will be many years before the full effect of the Interagency plan on the water supply can be felt, and meanwhile the question is more academic than actual. It is significant, nevertheless, because the proposed fulfillment of all aspects of the plan is staked on availability of water. Outstanding among factors whose full application is a long way off are the diversion of water for the proposed new irrigation and, under the agricultural program, the contemplated reduction of water runoff from the land and into the streams.

Under Interagency auspices, some advances have been made recently in gathering and collating information on water flow. One conclusion was that it would be a long time between droughts like the severe ones of 1934 and 1936. The subcommittee of Interagency technicians cautioned, however, that no study of water supply would give findings that would hold good indefinitely, that new checks should be made at intervals of perhaps a few years. In 1944 an engineering subcommittee of the Missouri River States Committee reported, in effect, that there was enough water for all uses. This view has been upheld by statements of the Army Engineers and the Bureau of Reclamation and by the inquiry by the Interagency subcommittee. But the course of the controversy has produced a confusing maze of big figures that appear to a layman to be conflicting and insufficiently representative.

A formidable array of challengers and questioners has arisen in the meantime to cast doubts on the size of the water supply. These have included the following diverse sources:

The Natural Resources Task Force of the so-called Hoover Commission on Governmental Reorganization.

Leslie Miller, who was chairman of that task force. Mr. Miller, a Democrat, was Governor of Wyoming in the 1930's.

The Library of Congress—an impartial source—through reports by an engineering specialist, Charles D. Curran, in its Legislative Reference Service.

The Engineers Joint Council, a clearing house for five leading national professional engineering societies.

The Public Affairs Institute, a privately supported civic agency at Washington, D.C., backed by various liberal interests.

The Regional Committee for a Missouri Valley Authority,

the moribund organization of MVA supporters. Its attack was spearheaded by Jerome G. Locke, an engineer, of Helena, Montana, once connected with the Army Engineers.

Governor Bonner of Montana, a Democrat, who fears that his state would be deprived of water rightfully belonging to it and badly needed there. He is a member of Interagency.

Governor Smith of Missouri, a Democrat, who has been particularly concerned about water supply for some of the cities and towns along the river in his state. He also is an Interagency member.

Two reports under the title: "The Missouri River Basin Program—Is There Adequate Water Supply?" were made in April and October 1950, respectively, by Mr. Curran of the Library of Congress staff. He concluded the first report by asking five "questions basic to the prosecution of the [Interagency] project." Summarized, these questions were: (1) is the prime consideration construction of the authorized works or determination of probable water supply to warrant the works? (2) should more money be spent on navigation works? (3) should additional navigation work be suspended? (4) should the big agricultural program be authorized "in view of the possible inadequacy of the water supply"? and (5) should the entire group of programs be revised to provide a single program that can be accomplished within the probable water supply?

The second Curran report resulted from certain additional data obtained. Its conclusion, in effect, was that there was enough water in normal years for all the federal projects now authorized by Congress, plus the pending agricultural program, but not enough in drought years. The report added: "Therefore, before the full demand of the present plan is created, the problem should be continuously

studied with a view to devising conservation measures and, if necessary, curtailing the presently conceived project in order to avoid any uneconomic over-development." Significantly, perhaps, this report was distributed among the members of Congress, which holds the purse strings of the Interagency plan (or aggregation of plans).

After receiving some Corps of Engineers figures ending with the conclusion that there was enough water for all purposes, Governor Bonner issued a public statement, renewing his attack on navigation. He said: "The disappointing showing is that there will be barely enough water to supply present Pick-Sloan [Interagency] projects and that more than 70 per cent of western water, supposedly protected by the O'Mahoney [-Millikin] amendment, will actually be used for the proposed navigation channel. Since about 47 per cent of the water that passes Yankton, South Dakota, originates in Montana, it appears that our state is taking a terrific loss in the distribution of water that is contemplated. These facts raise a grave question as to the feasibility of installing the lower river navigation channel, and, before further funds are expended on it, it would appear that a thorough investigation should be made by Congress."

Later, Governor Bonner received official notice of the Army's proposal to extend the nine-foot navigation channel upstream from Sioux City to Yankton. He sent a formal protest to the Corps of Engineers, asserting that the water for this purpose would originate west of the ninety-eighth meridian and is "supposedly reserved for upper valley consumptive use" by the O'Mahoney-Millikin amendment to the 1944 Flood Control Act. This placed a seemingly unwarranted interpretation on that amendment, which was

worded to allow use of western waters for navigation if this did not "conflict" with consumption in the western area. The Bonner protest, dated June 15, 1950, continued: "Eight different engineering reports on probable water supply and water uses in the Missouri valley above Sioux City are now before me. On careful engineering analysis, every one of these seems to show a serious water shortage for presently authorized projects. This is true with no allowance made for consumptive use of water by a needed soil conservation and better land plan such as is now pending before Congress [the agricultural program]. In Montana and, I suspect, in the two Dakotas, northern Wyoming, and northern Nebraska there are still thousands of fertile dry acres, and needs for better land use and restoration of ground waters in many practical but still unauthorized projects. I have seen no evidence that expenditures for navigation facilities will pay out at present or any visible future level of Missouri basin development."

IRRIGATION

Some of the most ticklish problems of the valley arise in connection with the ambitious irrigation proposals. Of outstanding importance is the question of cost. It has been rising so steadily for a long time that serious doubts exist whether much of the land for which it is intended will be able to bear the burden of paying for it. Irrigation is not provided as an outright government gift: the capital investment must be paid off by the benefited farms over periods of forty years or longer. Through assessments for the operation and maintenance of the local irrigating dis-

tricts the farms also must pay for the water they receive. Reclamation law and practice in this country are about half a century old, and the economic problems now involved are nothing like those envisioned at the start of the system. To be sure, irrigated land is worth more than dry fields, and the flow of water adds greatly to the value of cash crops; the question is whether the increment of values can hope to match the rising spiral of costs.

One specialist in this basin, who is in a position to be informed, has asserted recently that cost to the government of providing irrigating facilities has mounted to $3,000 per acre of irrigable land, while experience has shown that farmers, on the average, could hardly be expected to pay back more than $100 per acre over the full repayment period. Such a repayment would amount to about $2.50 per acre annually, plus the charge for water, which might be as much or more. Thus the irrigating charge for a typical farm, receiving water for, say, 80 acres, might exceed $400 a year, cash over the counter. The government expert quoted here is plainly not one of the enthusiasts for irrigation. If his figure for costs is correct, the government's initial outlay for irrigating 5,000,000 additional acres in this watershed would reach to the astounding total of $15,000,000,000. It is difficult, however, to make accurate checks, inasmuch as the figures vary by local districts, and you encounter various X quantities and imponderables in an endeavor to arrive at conclusions. For example, annual repayment charges might be $5 an acre in some projects.

Interagency's attention was directed to the situation not long ago through a paper by C. B. Conant, Jr., a Montana representative of the Farmers' Home Administration, a De-

partment of Agriculture bureau concerned with rural credit. Mr. Conant said a farmer starting out on a newly irrigated tract needed $7,600 for his own capital investment in the first year for a house, a household water supply, a barn, and a shed. He would need poultry and hog houses about the second year. If he had average success, he would attain an aggregate investment in his own facilities of about $28,000 in from sixteen to twenty years. The paper, based on some Montana irrigating projects, showed how the farmer could obtain long-term federal credit at reasonable interest for this, to be repaid from farm earnings.

Comments at the Interagency meeting were interesting. Mr. Sloan, whose federal career was mainly as an official of the Bureau of Reclamation, said, after hearing the Conant statement: "I can't think of anything more certain to discourage the prospective irrigation settler than to hand him this paper on credit. If those figures are true, we ought not irrigate another acre of land." Then Kenneth F. Vernon, Regional Director of the Bureau of Reclamation, commented: "It's been said that without proper credit you're going to have three successive sets of farmers on irrigated land before they make a go of it." Mr. Sloan rejoined: "Give those figures to every applicant for irrigated land and see what happens." Interagency Chairman Young interposed: "I think it's time we faced the fact that we haven't irrigated land merely when we have built a dam." Governor Peterson made this rhetorical inquiry: "Is it a proper function of government to furnish capital for every one who wants to go into a capital enterprise—and is there money enough in America to do this?" Mr. Sloan explained then that he would not object to the $28,000 figure if this in-

vestment could be spread out over a long period of years.

In the course of his presentation Mr. Conant said: "Many years will pass before a settler with inadequate resources can bring his [irrigated] unit into reasonable production. Meanwhile the family may live in a tar-paper shack and have practically no money for adequate food, clothes, school, and medical care. Contrary to the hopes of most settlers, it costs about as much to develop a new irrigated farm on a new project as it does to buy a similar one elsewhere already developed."

Under the federal Reclamation Act, the elaborate and relatively costly plans for an irrigation project must be prepared and accepted by a vote of the people in the affected district before construction can be carried out. This presents an inherent difficulty. Out in the Columbia River basin there have been instances where twenty years were required to complete this procedure, but in connection with certain special projects elsewhere Congress adopted exceptions that enabled faster action.

There is a further difficulty. Once the dam and distributing system are built, the local district must enter into a repayment contract before the water can be delivered to the land. Mr. Sloan has charged publicly that "the long-drawn-out procedure involved is delaying repayment contracts." These contracts require the signatures of the individual farmers, who must be confident that they can stand the cost before they will sign. By administrative policy, these contracts usually have been negotiated ahead of construction. Mr. Sloan, however, in a sort of swan song as he retired, told Interagency that only one such contract had been executed, though many had been under consideration

and negotiation for at least five years. By the end of 1950 there were ten instances of completed irrigation dams standing essentially idle for lack of repayment contracts. In one of these instances, Heart Butte Dam in North Dakota, an adverse decision against formation of a district was handed down in trial court about a year after the dam was finished. The Frenchman-Cambridge irrigation diversion in Nebraska also reached the courts.

Not all the investment costs in irrigating facilities are charged to irrigation-users. Electric power is a big incidental feature, against which some of the outlay is charged. To a lesser extent there is some offset for serving municipal water supplies. You can get into an interminable welter of philosophies and of accounting theories in trying to decide the proper allocations. The original conception of Missouri basin irrigation under the Pick-Sloan plan was that of treating the scattered areas, aggregating 5,000,000 acres, as a single project for purposes of economic justification. The report on the underlying Sloan plan had freely admitted that many of the units could not be justified if they had to stand by themselves. As he retired, Mr. Sloan complained, however, that many administrative decisions had been made in the Bureau of Reclamation with the effect of requiring individual justification for each unit. He charged that this brought about some "stretching of facts" to prove the feasibility of projects. He argued for a single basin-wide account for irrigation and for drawing on power revenue to help pay for irrigation. Furthermore, he gave a reminder that he had been pointing out for years a fundamental difference in federal policies on flood control and irrigation: most of the cost of flood control, to protect land from

water, is borne by the nation as a whole, while a great part of the cost of irrigation, to provide land with water, is paid by the landowners. On the other hand, such highly vocal critics as Bernard De Voto question whether the nation at large ought to share the cost of irrigation.

The National Reclamation Association, which is, in effect, the lobby of private interests backing the Bureau of Reclamation, has shown signs of concern over the cost. It has said, in one of its bulletins: "The continued development of our reclamation projects of the West requires, perhaps more than any other time since our association was founded eighteen years ago, the united support of our members and the entire West. . . . Our remaining projects are extremely costly. There must be a greater recognition of the public benefits of reclamation. There must be a liberalization of our present reclamation law. . . . The obstacles confronting us are not insurmountable."

The Department of Agriculture, it has been disclosed on good authority, takes the stand that each individual project for irrigation should be justified on the basis of costs and benefits involved. This point of view is opposed to that expressed by Mr. Sloan, but in line with the administrative policies of the Bureau of Reclamation.

The question of irrigation costs is nothing new. It was recognized even before the Pick-Sloan plan became law.

One of the difficulties presented by the irrigation program is the necessity for a considerable amount of pumping to move water supplies uphill. It has been stated officially that thirty-three per cent of the electric power to be generated by Interagency hydro plants would be consumed in irrigation pumping. This, of course, adds to the costs of in-

stallation and operation, and thus exaggerates the economic problem. It also cuts down the volume of power that might otherwise be available for industrial development. On the other hand, some of the current for this pumping would be generated from the "head" created in irrigation canals rather than in the plants at the dams on the streams.

You can get a lively argument over whether there is any sense in creating new farmland through irrigation after a long period of surpluses of farm products and federal support of farm prices. The report of the Engineers Joint Council questioned the need for more land, holding that increased productivity of existing land would meet the demands of growing population. An official statement by the state of Missouri also challenged the justification of more irrigation as opposed to "improving and conserving land now in production." The comments of both the engineering group and Missouri were directed to the President's Water Resources Policy Commission. The matter has come up in Interagency's discussions, but the comments there favored more irrigation. The point of view was that the effects of such development were long-range in character, whereas today's farm surpluses could become tomorrow's shortages. It was pointed out also that the effect of adding 5,000,000 acres of land would have only minor bearing on the volume of nation-wide farm production. In addition, the argument has been made repeatedly that America not only must be prepared to feed its own markedly growing number of people, but should also be in a position to help meet the needs of many hungry areas of the world in the interests of democracy. On a lesser scale, it has been argued that irrigation would contribute to bringing more people into the Missouri

watershed and to opening new stores and service shops in local communities, with a beneficial effect on regional economy.

One of the factors that have tended to slow public acceptance of new irrigation has been a long cycle of relatively wet weather in the region. This persisted through the 1940's and into the 1950's and contributed definitely to crop production that played a part in the outcome of World War II. Some farms in dry country which might normally be expected to welcome irrigation have got along well enough with natural moisture. In some proposed irrigation areas reaching toward the eastern parts of the Dakotas, Nebraska, and Kansas, some people question the need because the normal natural precipitation is fairly good. Whatever the reasons, the result has been so far, as heretofore noted, that only 2,300 acres out of 5,000,000 acres have been irrigated in the Interagency program.

The serious question of the big irrigation scheme in North Dakota under the Missouri-Souris Diversion was discussed in the preceding chapter. There are difficulties in other areas. There has been much squabbling in Nebraska and Kansas over irrigation plans. New irrigation in the North Platte River valley in Wyoming has been talked about, but a Bureau of Reclamation official has declared that there is not enough water there. To make it work, he said, new supplies would have to be brought from the Colorado basin, drawn from the Green River in Wyoming and the Yampa River in the Colorado mountains.

Not all irrigation is done by water drawn from streams; a considerable part is handled by pumping water from the ground. This type presents the basic problem of mainte-

nance of the ground-water supply, which in turn is related to the whole question of sufficiency of water.

NAVIGATION

The biggest question about navigation on the Missouri River is whether it is worth the tremendous capital investment and the constant heavy expense of maintenance. This is an argument of long standing between the railroads and their champions on the one side and the rivermen and the liberals on the other. Two subordinate civilian engineers for the Army were riding one day in the pilothouse of an Army survey boat when a Missouri Pacific Railroad freight train went by, hauling some reels of cable and some carloads of steel shapes. One of the engineers pointed to these goods and said to his companion in quite a matter-of-fact tone: "We ought to be hauling that stuff." (His possessive "we" meant the barge lines, not the Army.) The very month that remark was made, the *Missouri Pacific Lines Magazine* reprinted an article from a publication of the Chamber of Commerce at Wichita, Kansas, which began: "A fake, widely believed, has it that river transportation is cheap. It is as false as the story that the moon is made of green cheese."

The article went on to assert that the government had spent about $328,000 per mile on the channel between Kansas City and the mouth of the Missouri in the past twenty-nine years—or almost enough to have paid for construction of all four rail lines between Kansas City and St. Louis at $88,000 a mile.

The estimated eventual investment cost of Missouri

River channel work in the district below the Dakota dams —mainly for navigation, plus the incidental stream and bank stabilization—was placed at $277,300,000 as of 1949. Indicated expenditures toward this objective up to June 30, 1950 were in the neighborhood of $188,000,000. Thereafter the Army reported that the nine-foot channel below Sioux City was 75 to 80 per cent completed. People used to regard the Missouri as wholly unruly, a river that could not be tamed. The Army has demonstrated clearly that this is not so; given enough money, it can make the river behave and stay put. Efficacy of the watery straitjacket is evident even to the amateur eye, but the task of keeping the jacket's seams repaired is unending. If this job is neglected, the costly garment is likely to be torn to pieces by the wild river.

In short, a huge federal subsidy is required to provide and keep up the waterway. This has long been justified by navigation advocates on the ground that the result is for the general public good. In earlier days there was an argument that cheap freight rates for water-borne traffic would serve as a yardstick to help lower rail freight charges. While the principle of joint water-rail rates has been legally upheld, there has been no broad, convincing evidence that rail rates have been forced down by the competition of river transportation. Rail rates are fixed in a national pattern by the Interstate Commerce Commission. And as far as the Missouri is concerned, there has been no effective competition yet, though shallow-draft barge movement has been feasible at least as far upstream as Kansas City for some years. If and when the nine-foot channel is finished all the way up to Sioux City, and if and when navigation is ex-

tended on up through the Dakotas, the question still will be whether even a highly developed economy in the Missouri basin would afford enough traffic to furnish financial justification. The Army Engineers, whose civil functions started with navigation more than a century ago, insist that recent surveys prove that "available tonnage" for the river below Sioux City is more than big enough to justify the expense by their standards. They assert that the incidental benefits from their Missouri River channel work, attributable solely to preservation of bottomlands, cities, towns, bridges, highways, and railroads, already have amounted to more than $215,000,000, a sum in excess of the channel cost to date. Such benefits are figured to be accruing now at $20,000,000 annually. One ardent Army spokesman holds that the assignment really should be called "the navigation *and* stabilization program."

Tonnage hauled so far on the lower Missouri has been small compared with the booming business on the Mississippi and some of its other tributaries. There was a marked increase, however, on the Missouri in 1950 over 1949, with the 1950 haul estimated at 150,000 tons. While this rise was taking place the Army looked over the environs of the river downstream from Sioux City and concluded that more than 5,000,000 tons of freight are "suitable for commercial navigation annually on the Missouri in the future." Even if this is true, if the capital and maintenance costs were added to the freight charges of the barge lines, the price of transport doubtless would be prohibitive. As it is, the low barge tariffs are inviting to shippers for bulky commodities moving at a leisurely pace and subject to the long winter shutdown of operations. Successful barge operations on the

Mississippi have demonstrated that river movement is suitable for such things as gasoline, crude petroleum, sand and gravel, fuel oil, coal, sulphur, kerosene, wheat, cement, corn, and ores. On the Missouri a major portion of the movement has consisted of materials for the Army's own river-control projects. An average string of towboats, in a channel sufficiently deep, can carry perhaps 14,000 tons of pay load, which is fifty times what a typical early steamboat could hold, and which also is equivalent to about five long railroad freight trains. Obviously, Missouri River navigation cannot be put to a full test unless the channel is completed. Only then might the anticipated tonnage be lured to the stream: a single shallow or wild stretch could effectively block boat traffic.

Missouri, with the largest population of any state in the Missouri River valley, and the area in which the most men and boats could be expected to work in navigation, would seem to be a notable beneficiary of the channel development. Yet this state, in an official statement to the President's Water Resources Policy Commission, had the following to say on the subject: "There exists a six-foot channel at the present time, with a nine-foot channel authorized and being built as fast as funds permit. And already plans are being made for a twelve-foot channel, even before the present authorized plan is completed. Such developments are hard to visualize on a river like the Missouri, where waterway traffic is admittedly an experiment and from all indications will remain one for some time to come."

A problem in the suggested extension of navigation across the Dakotas will be the engineering and substantial cost of boat by-passes for the five big dams there. These

dams will range in height from 45 feet to 240 feet; for the taller ones a series of locks, rather than a single lock, would be necessary unless the more spectacular alternative of marine railways should be adopted.

Still another problem was referred to in a preceding section—that of whether there will be enough water in the river to sustain full navigation operations. One suggestion has been for low dams for slack-water navigation in the lower river.

The strong lobbies on both sides of the navigation question will continue to assail Congress. And constantly there is the physical problem of the river itself. The Army Engineers know very well what they are up against there.

FLOOD CONTROL

While flood control of rather localized character is desirable at many places in the drier western part of the Missouri watershed, the greatest need for it occurs in the eastern half of the region, especially in the Missouri River proper and its larger branches in Missouri, Kansas, and Nebraska. To a considerable extent the big upstream reservoirs will reduce or prevent flood flows onto the areas immediately below the dams. The biggest problem lies in providing dams on the big downstream tributaries and extensive levees along the Missouri itself below Sioux City. The big upriver dams and reservoirs simply cannot assure flood protection for the rich, fertile, populous valley of the eastern end of this continental water funnel. Concentrated rains falling in a relatively small area can cause catastrophic inundations. The severe flood in the lower Missouri and the

middle Mississippi in the early summer of 1947 was caused entirely by extremely heavy rains persisting over a period of three months in Iowa, northwestern Illinois, northern Missouri, and eastern Kansas and Nebraska. The flooding occurred only below Sioux City in the Missouri and below Muscatine, Iowa, in the Mississippi. The upstream dams could not possibly have held the Missouri within its banks, though the Army Engineers calculated that the five dams in the Dakotas, had they been in existence then, would have reduced the flood crest by two or three feet at Kansas City and thence downstream.

An outstanding flood-control feature of the Interagency program is the proposed system of levees, usually designated "agricultural levees," to plug up every gap in the lowlands along the fringes of the Missouri River from Sioux City to the mouth. The cost of this system was estimated by the Army Engineers, as of 1950, at $130,250,000 —including $119,700,000 federal cost and $10,550,000 local. Reported allotments up to June 30, 1950, were $21,697,700. The river has "reverted to its former wild state" in many stretches because of the enforced neglect of the channel in the 1940's. As a result, General Sturgis has declared: "This condition makes it undesirable to proceed on schedule with the agricultural levee program." So far no attempt has been made to provide levees between Kansas City and the mouth, the stretch where the Missouri is at its broadest and where frequently the greatest flood damage is done. The Army Engineers say levees in this section are inadvisable unless flood reservoirs are built on the lower basin tributaries. The levee system proposed by the Army would cover 1,140 lineal miles, or just about three quarters

13. (a) *The Capitol, Lincoln, Nebraska.*
Edholm & Blomgren, STATE OF NEBRASKA.

(b) *Catholic Cathedral of the Holy Spirit, Bismarck, North Dakota.*
Bismarck Tribune.

14. *Large petroleum refinery on the North Platte River at Casper, Wyoming.*

Ken, Industrial Development Association of Central Wyoming.

of the entire distance, on both sides of the river, between Sioux City and the mouth.

The levees, triangular in cross-section, would average perhaps 13 feet higher than present ground level. This elevation, plus the fact that the sites are on considerably higher ground than the riverbanks, would be counted on to ward off the extreme floods envisioned. Earth would be piled up to form these barricades, which would have an average width of 80 feet at the base. Thus the sites of the levees would cover about 11,000 acres of bottomland, which might easily be found to be worth considerably more than $1,000,000. Now, here is a catch: under the ruling federal law, the Flood Control Act of 1936, local communities must provide the sites and make binding agreements to shoulder the costs of maintaining the levees. The usual method of handling this is to set up a levee district, a quasi-municipal corporation, which deals with the individual landowners affected. It is feasible to do this because the levee system would consist of a set of independent structures. Whether all the local communities will be willing and financially able to accept the burden remains to be determined; wherever they fail or refuse, the Interagency program will fail to furnish localized flood protection. The maintenance cost of levees was figured at $615 per lineal mile back in 1945; it would be appreciably higher now. The sort of thing that the districts must do is mow weeds on the levees, trim off timber, fill animal burrows, and patch breaks and washes. Interagency has said that 1,448,000 acres of land in Missouri, Kansas, Iowa, and Nebraska would be protected from floods by the complete levee system—but there are differences of opinion among informed

persons as to the extent of protection. For example, a publication of the Army Engineers estimated the protected acreage within Missouri as only about two thirds of the area stated in an Interagency report.

The levees opposite each other would be set far back from the banks of the river, averaging 5,000 feet apart below Kansas City, and 3,000 feet apart above it. The effect would be to create between the levees a floodway with net area of 150,000 acres. This floodway, including some of the most productive farmland of the region, would be subject to occasional inundation, as its only protection against floods would be the partial relief afforded by the upstream reservoirs. The Missouri Farmers' Association has objected to this scheme on the ground that it would affect "nearly half of the fertile Missouri River bottom from one end of the state to the other." No proposal to indemnify the owners of the floodway land has been made. The *St. Louis Post-Dispatch* reported some time ago: "The Army thinks that a considerable portion of this farming area would continue to be as valuable, on the floodway, as it is now, under the threat of intermittent natural flooding, but the Army recognizes that compensation could be required, if it were shown there was actual damage resulting from its plan."

The path for flood protection, in any case, would seem to be thorny as well as watery. Some persons, for instance, have questioned whether the plan can have economic justification when the sites for protective works are priced at relatively high levels of good bottomland for farming and the benefits to crops protected are based on government-support prices for farm products under the celebrated

parity system. By way of illustration, the Army Engineers asserted in a pamphlet in the early days of the basin program that the assumed annual dollar benefits of the reservoirs it originally proposed within Missouri would be more than five times as great as the value of crops from land permanently withdrawn from cultivation in the reservoir sites. The University of Missouri's College of Agriculture countered in a news bulletin with the assertion that these reservoirs would protect no more land above the Missouri River mouth than the area of the reservoir sites "essentially eliminated for agricultural use." This statement did not take into consideration the fact that average crop value of the land thus protected probably was greater than average crop value of the land in the reservoir sites. That kind of subtle difference, however, tends to make problems in consummation of the plan.

The university's comment indirectly reflected a touchy aspect of the whole flood-control problem. The Interagency plan is not limited to the Missouri basin in its effects, for it would help hold back flood waters along the Mississippi, reaching down into the low "bootheel" corner of southeastern Missouri, which to all intents is part of the cotton-growing, race-conscious South. Some persons in northern and western Missouri have frankly stated in the past that they were not interested in having reservoirs taking up some of their good land to help protect the Mississippi River bottoms and the people down there.

The program of the Army Engineers for big dams in Missouri and for one such structure in Kansas has been stymied, in contrast with the way other projects have moved along. The Kansas undertaking in question is Tut-

tle Creek Dam, which would be in the Big Blue River near Manhattan, where that stream enters the Kansas River. This job was authorized by Congress in 1938, but there has been a bitter local controversy about it ever since, and only some minor planning funds have been appropriated for it. People of northeastern Kansas quarreled over the location. The Army Engineers resurveyed the problem and came back with a recommendation for the original spot and plan on the ground that they would be cheaper than others and give more protection, but the objections continued. Meanwhile estimated cost of the job rose from $28,000,000 in 1941 to $68,164,000 in 1949. The purpose is to hold back flood waters from the Kaw, so that its threat to the valley all the way to Kansas City and beyond will be lessened. Now two more Kansas dams are contemplated.

In Missouri, the Army, or Interagency, plan applies to three important tributaries of the main stem: the Osage and the Gasconade on the south side, the Grand River on the north. The original plan for the Osage, authorized by Congress, provided for Osceola Dam, a big structure on the Osage, and two lesser dams on branch streams. Interagency was amazed early in 1947 when Phil M. Donnelly, then Governor of Missouri and an Interagency member, challenged the Osage plan. He complained that the vital factors of soil conservation and retardation of water runoff had been ignored. His forceful attack produced an innovation: Interagency and, more particularly, the Army Engineers backed down from their proposal. General Pick agreed to a co-operative study by all federal and state agencies concerned. This resurvey took a year, after which it was agreed to make radical changes in the dam scheme. Instead of

Osceola Dam and the two smaller dams in Missouri, which would have had combined storage capacity of 8,170,000 acre-feet, a new set of nine dams was substituted, with an aggregate capacity of 6,631,000 acre-feet. Four of them would be in Missouri, five in Kansas; and the largest of the substitutes would hold only two thirds as much water as Osceola. The new plan also provided for soil conservation, reforestation, and other land-use measures. It moved on to Congress, but so far has not reached the construction stage. Some of the old arguments persist in the affected area, but the new plan was generally accepted as suitable.

As a result of the good feeling engendered by this latter-day Missouri Compromise, a similar co-operative study by federal and state agencies was undertaken in the Grand River watershed in 1948, with the same objective of achieving a better-rounded and less objectionable plan. This time agreement was delayed and it took three years or more to get a report from the resurvey group. Congress had authorized the Army Engineers to build one structure, Chillicothe Dam, but complaints from the neighborhood were so strenuous that the engineers proposed two other dams in place of it. The general expectation was that the modified plan would follow a new Army recommendation for seven dams scattered over five counties of northern Missouri. It has appeared, however, that trouble would be in store for this compromise. It contemplated aggregate storage capacity of 4,760,000 acre-feet for the seven dams, which was much more than originally proposed for the Chillicothe project. One of the greatest sources of objections to all Interagency dams has been the inundation of bottomland by the reservoirs; the greater the storage capacity, the more

such inundation. It is likely that the Grand River undertaking will not be settled for years to come. Meanwhile the lower Missouri Valley is deprived of the measure of flood protection that it would provide there.

The Army list provides for two relatively small dams on the Gasconade River, a picturesque Ozark Mountain stream. No open controversy has broken out over these, but the engineers themselves have not been satisfied, and have been considering for a long time the shifting of the sites. Little progress has been made about the Gasconade situation.

Some idea of the importance of the delayed projects for the Osage, the Grand, and the Gasconade may be gained from the fact that combined storage capacity of the reservoirs in these three sub-basins would be more than one half that of the huge Garrison Dam in North Dakota.

While opponents of "high dams" complain about the loss of useful bottomland for the resultant big reservoirs, the Army Engineers patiently point out that the bigger the reservoir, the less ground it will cover per acre-foot of water impounded. In other words, it would be more wasteful of land to split the storage into many smaller reservoirs than to concentrate it in larger ones. The stock answer of the objectors is that it would not be necessary to store so much water and provide for silt accumulation if adequate steps were taken to hold the water and the soil in their proper places on the basin's whole terrain. They are right, up to a point: silt and water storage could be reduced by comprehensive conservation measures, but such measures would not even approach doing the whole job. Furthermore, if the dams were eliminated, power production, irrigation, do-

mestic water supply, and whatever hopes there are for improved navigation flows would be knocked out.

AGRICULTURAL PROGRAM

Conservation of the soil, retardation of water runoff, and abatement of silt in the comprehensive fashion desired, all depend on the ambitious, accelerated program of the Department of Agriculture for the Missouri valley. This program, in turn, depends in the first instance on approval by Congress. Secretary Brannan transmitted it to Congress on September 29, 1949, and there it has languished without public hearings in the field being set. So far it has met about the same fate as that other celebrated Brannan Plan for a new nation-wide system of farm subsidies, except that the Secretary's Missouri basin proposal has found favor with representatives of the area affected and has received only one brickbat publicly. The Interagency committee has acted formally to approve the program, which is tantamount to acceptance in principle by the states of the region. The plan has at least the implied backing of the Missouri River States Committee. Unless there is vigorous support of the scheme at Washington by the region's governors and congressional delegations, however, it is not likely to get either authorization, the first step, or appropriations, the showdown step. With the fate of the world in the balance, there has been an understandable reluctance to press very hard for the agricultural program. National defense comes first, but in the long-range sense the national defense might be promoted by conservation in this broad region.

One of the ticklish facts involved is that most of the basin states are Republican, while Congress and the national administration are Democratic. As a result, the feeling of the governors' committee has been that the spokesmen of this committee might not be too well received, but the narrowed margin of Democratic majority in Congress might alleviate this concern.

The sole public criticism of the agricultural program came from the Department of the Interior, a partner of the Department of Agriculture in Interagency. Former Secretary of the Interior Julius A. Krug attacked the plan for a wide variety of reasons in a public letter to Secretary Brannan. In some respects Mr. Krug's stand reflected concern over the volume of water available for irrigation if the conservation measures were adopted. The dispute was quieted, if not dissipated, when Oscar L. Chapman succeeded to the Interior secretaryship. Questions of jurisdiction had been raised, however, which quite possibly will come up again if Congress digs into the matter. In contrast, responsible Army officials have publicly approved the agricultural plan and have expressed satisfaction over this addition to the general Interagency plan. The Federal Power Commission has commented that a material reduction in siltation of the Missouri River not only would facilitate navigation but would make possible an entirely new scheme for hydroelectric plants with large power output in the stretch between Gavins Point Dam, in South Dakota, and the mouth of the Missouri.

The huge cost of the agricultural program, both to the federal treasury and to the landowners, farmers, and ranchers of the basin surely will present a stumbling-block. If

the plan is to work, the federal purse strings must be loosened with a hard yank and the private interests must be treated with overwhelming persuasiveness. Rough calculations indicate that the private expenditure might eventually average more than $8,600 per farm, or a figure approaching $19 per acre on the basis of the original cost estimates.

Other problems that may give the program hard going include the complexity of the scheme and the bold scale on which it is pitched; the possibility of jealousy on the part of other watersheds for which no such undertaking has been proposed; and the overlapping of soil-conservation work by separate and seemingly rival bureaus of the Department of Agriculture, notably the Soil Conservation Service and the Production and Marketing Administration.

SOIL EROSION AND SILTATION

The problem of the washing away of the soil—which makes the silt that clogs the rivers—is intimately related to the agricultural program for this region. Without question, good topsoil has been dispersed at an alarming rate by action of water and of wind in many large areas. Disagreement has developed, however, as to the source of the soil that finds its way into the Missouri River. A common view has been that the soil washes from the land and into the rivers, but Department of Agriculture specialists deny that all the eroded soil finds its way into the streams. Mr. Sloan has gone much farther, espousing a theory claiming, in effect, that the silt in the rivers comes largely from the stream beds themselves, rather than from the lands of the watershed. He has argued that much of this erosion can be pin-

pointed to small areas, such as the classic example of the bed of Five Mile Creek in west-central Wyoming, between the Wind River Range and the Owl Creek Mountains. Earth from Five Mile Creek presumably goes through the Big Horn, Yellowstone, and Missouri rivers. The Sloan argument notes that such movement of silt in geologic time was the source of the fertile bottomlands along the Missouri and the Mississippi, from Yankton, South Dakota, to New Orleans. Much more factual information is needed to form a basis of sound judgment in determining what to do about the silt. The silt comes also from such streams as the Little Missouri, Cheyenne, Bad, White, Platte, Kansas, and Grand.

General Sturgis has said: "Garrison Dam will be required to store the tremendous silt load of the Yellowstone River, largest contributor of silt in the Missouri basin." Twenty-one per cent of the storage capacity of the Garrison Reservoir, or 4,900,000 acre-feet, will be dead storage—space where silt can pile up. At recent price levels this space represents more than $43,000,000 of the cost of the project.

Interagency has been told by Mr. Sloan about findings of sediment sampling stations in the ten-year period of 1938–47. Omaha is the station farthest downstream. The average annual silt load in the Missouri River at Omaha in that decade was 154,760,000 tons, with a range from 82,670,000 tons in 1939 to 243,880,000 tons in 1944. The calculations showed that the average represented a loss of soil over the entire watershed above Omaha amounting to only two thirds of an inch in depth of soil in a century. Mr. Sloan conceded that this manner of averaging the soil loss did not "present a true picture," as the actual loss

might be much worse in some areas than in others. He then moved on to expound his theory of pinpointing the critical erosion spots. He told Interagency that the amount of soil erosion could be measured by the volume of suspended sediment in the rivers. This view was challenged immediately by Chairman Young and by a Forest Service biologist. Mr. Young, in implied defense of the agricultural conservation program, said that the question raised by the Sloan paper was "the degree of control man can give" soil erosion. The conclusion would seem to be inescapable that man has quite a job cut out for himself in his undertaking to desilt rivers and hold topsoil in place.

An ironic incidental is the fact that the Army Engineers rely heavily on the silt in their system for regimenting the Missouri River. It is silt that is caught by the rows of timber piles to form new land where the engineers wish to change the course of the water.

No thorough data are available as to the amount of topsoil that has been lost from the lands of the Missouri watershed by erosion. This loss has been taking place more or less continuously during geologic time; it has been far worse in some areas than in others. Erosion by water naturally has been greatest in the eastern part of the basin, where the rainfall is heaviest. Wind erosion has been most severe on the plains, particularly in the droughts of the 1930's. Federal studies at several selected stations, notably in southwestern Iowa and northwestern Missouri, have yielded definitive information on water erosion. The findings showed clearly that soil-conservation measures and crop rotation helped hold the topsoil in place. In contrast, planting of corn year after year resulted in loss of as much

as three and one half inches of topsoil from a relatively gentle slope in the course of a decade.

The Department of Agriculture insists that positive proof exists that erosion can be controlled effectively under practical farming conditions. Much progress has been made since the middle 1930's in spreading the gospel of soil control through the Department's Soil Conservation Service and Production and Marketing Administration, with the co-operation of the state agricultural colleges and extension services and of farm organizations. Nevertheless, an appalling amount of work remains to be done to bring soil conservation in this region somewhere near universal application. One of the difficulties is that the rate of erosion tends to accelerate rapidly once the soil begins to wash or blow away without hindrance.

One of the refreshing things about Interagency's activity has been that it has served to let new ideas come out. For example, the committee has been told that time-honored American ideas about landownership must be changed in order to help save the soil. This advice came, not from a political radical, but from Clyde Spry, assistant secretary of agriculture in the Republican state administration of Iowa. He said: "We will have to change the conception that the ownership of land gives the owner the right to do as he pleases with the land. We must do something to change the thinking of those who own and those who occupy land so they will consider themselves stewards or trustees of the land. The motto of the National Association of Soil Conservation Districts is: 'With the right to own goes the duty to conserve.' "

ELECTRIC POWER

Who owns the tremendous power latent in running water? Is this a natural resource belonging to all the people, or is it something to be exploited for private profit? Shall the federal government, which is harnessing this power in the rivers of the Missouri basin, transmit the current to the areas that need it and direct the distribution through public and semi-public channels, or shall it turn the output over to the private utilities at the dams? These questions typify a great and fundamental struggle going on in this region, just as it is raging in other parts of the country. It is the issue of Public Power *vs.* Private Power. The well-financed and aggressive lobby for private power shouts "Socialism!" about public power, and political and economic conservatives inveigh against this "invasion" of business by government. Nevertheless, many persons who are not radicals or even socialists or Fair Dealers think that it makes sense for Uncle Sam to handle the power in the rivers as a resource of the nation.

Federal laws require that preference in sale of publicly generated power be given to public distributing systems such as numerous municipalities have, or to public power districts, or to rural electric co-operatives. When private power realized that it could not stop construction of the public generating facilities in the basin, it turned to the theme of private control of the output all the way from the public source to the consumer. It proposed to contract for the current supply, arguing that this would prevent wasteful duplication of costly transmission lines. The catch is that small

cities and some rural co-ops cannot afford to build long, costly transmission lines to bring power from the dams to their customers. If the public power-supply system cannot build transmission lines to reach these little distributors, or make satisfactory arrangements to move power over privately owned utility lines, the small towns and co-ops are deprived of needed current. There has been much sniping and open fighting against Interagency's public power. One of the most bitter and determined attacks of private power on public power was an unsuccessful effort by the Montana Power Company to prevent the Bureau of Reclamation from building a power-generating station as part of its Canyon Ferry Dam, being erected near Helena, Montana. This attack was successful at first, but was defeated before it could cause serious interference with the project.

Already in existence is a public power grid that has reached many sections of the country, including large strips of the Missouri basin, and is growing. Some public officials familiar with it say in personal conversations that the demand for more power is so great that a national public power grid appears to be in the making. There are regional interconnections, and a few years ago the consumption of electricity in the Pacific Northwest was so large that the machines were overloaded and electric clocks in the Dakotas ran slow. The Department of the Interior is designated by law as the marketing agency for federal power; it delegates this function to different subsidiaries in different regions, the Bureau of Reclamation being the marketer in the Missouri watershed. Some critics within governmental circles assert that the bureau is putting undue emphasis on its power assignment and is encouraging aggrandizement

of the system. This view overlooks the generally accepted fact that more power is needed and would help the region.

As the power-producing facilities grow and the market is expanded, there will be a vital need for steam plants to assure a constant flow of current. The hydro plants will not have water for full-time operation. Already the lines are laid for a fight between public and private power over the steam plants. Who shall build them—the government or private industry? Such a fight was won by public power in the TVA country, after a bitter controversy, when Congress authorized a Tennessee Valley Authority steam plant at New Johnsonville, Tennessee. It was disclosed several years ago that the Department of the Interior was considering addition of public steam plants in the Missouri basin. The talk was soft-pedaled after that. When Assistant Secretary of the Interior William E. Warne appeared at an Interagency meeting late in 1950, he discussed with newspaper reporters the desirability of more power for national defense. He pointed out that steam plants could be erected faster, though at greater cost, than hydro plants. He was then asked if the Interagency program contemplated construction of steam plants. His succinct reply was: "Not by the federal government." The next question was whether the government might make loans to private industry for these plants. His guarded response was to the effect that this might be "one way," but he added that he was not prepared to go into details. The personal conclusion of the reporters was that the Department feared to enter the field of steam plants, but later it showed new interest.

Some of the public power of the basin already is going to private utilities, in some instances because there is either

no means of delivering it to other distributors or not enough consumption handled by available public distributors. The Bureau of Reclamation also has in some areas "wheeling contracts" whereby transmission lines of private utilities are employed to relay power to public or co-op distributors. When such an agreement was made recently with the Montana Power Company to carry current from Canyon Ferry Dam to Great Falls, Montana, Secretary Chapman said this avoidance of duplicating lines would save five hundred tons of aluminum cable and other critical materials. Some skeptics cannot refrain from wondering whether the wheeling contracts may not prove to be entering wedges for private power to manipulate public power handling.

The marketing of the public power began to be a headache to the Department long before the big new hydro plants approached readiness. Policies have been set up only to be altered or scrapped. The biggest supply will be generated at the dams in the Dakotas, but Nebraska, the only state in the nation served entirely by public power districts, has been in line to get much of the output. The situation forced South Dakota, apparently somewhat against its will, to adopt an enabling statute for public power districts, though the measure was criticized as lacking sufficient strength. North Dakota may yet find a similar step advisable. The talk has been of assurance that each state will receive its "fair share" of the power. Intense interest was aroused in the public and in the state administrations when the early debates were at their height. The issue is by no means fully settled yet.

A persistent question has been whether the Interagency

program was going far enough in its provision for electric power. Early estimates, when it was still the Pick-Sloan plan, were that generating capacity to be installed in the basin-wide system would be 2,000,000 kilowatts, annual production 10,000,000,000 kilowatt hours.

The significance of these terms, "kilowatt" and "kilowatt hour," and of the staggering figures by which they are measured in this program, can be better understood with a brief explanation. A kilowatt is 1,000 watts; a watt is the basic unit of power capability as set by an old formula. Capacity expressed in kilowatts means simply the energy of electricity that can be generated at any given instant. A kilowatt hour is the use or "consumption" of the generating capacity of one kilowatt for a period of 60 minutes. Now, an electric bulb in common use in homes is rated at 60 watts: in an hour it burns 60 watts, and it consumes exactly one kilowatt hour of supply in 16 hours and 40 minutes of steady burning. Translate this in terms of the original Pick-Sloan power estimates stated above: that generating capacity of 2,000,000 kilowatts would be capable of lighting simultaneously 33,333,333 of your 60-watt bulbs; that annual production of 10,000,000,000 kilowatt hours would keep more than 19,000,000 such bulbs lighted continuously for a year. Production never calls for the full use of generating capacity every hour of the year; people do not use electricity that way.

Critics asserted when Pick-Sloan was new that the basin was capable of an output of perhaps 18,000,000,000 kilowatt hours per year. Then, early in 1947, Interagency suffered a shock when Lester C. Walker, a Federal Power Commission engineer, delivering a report he had been in-

structed to make, declared that the plan actually provided for only 1,600,000 kilowatts of capacity and 8,000,000,000 kilowatt hours in annual production. That was not all. He added: "We consider 5,000,000 kilowatts capacity, with an average annual potential generation of 25,000,000,000 kilowatt hours, a somewhat conservative estimate of the total potential hydroelectric power of the basin." The conflict of big figures went on when Chairman Nelson Lee Smith of FPC commented on the agricultural program for the basin. Mr. Smith asserted that a material reduction of silt in the Missouri River might make possible additional power plants in the lower river—not now part of the Interagency plan—which would turn out 12,500,000,000 kilowatt hours per year.

Ben Greene, FPC's Interagency member, warned the committee late in 1949 that by 1970 the provisions then existing would fall far short of meeting the basin's demand for power. By that time, he declared, the region will require dependable generating capacity of 9,673,000 kilowatts, of which only 2,026,000 kilowatts would be derived from Interagency's hydro plants and 3,725,000 kilowatts from private utilities and various non-federal public plants. The big deficiency of 3,922,000 kilowatts would have to come from new sources. Mr. Greene mentioned as possible sources steam- or diesel-operated generating plants or atomic energy, which last is looming larger as a potential source of power. The need for power is recognized by Interagency, and the fact that its intentions regarding power have been expanded repeatedly has been a hopeful sign. By the spring of 1950 it had been agreed among FPC engineers, the Army Engineers, and the Bureau of Reclamation that Inter-

agency plants completed or under construction, plus others under tentative consideration, would have capacity of 3,191,000 kilowatts and ultimate annual average output of 13,750,000,000 kilowatt hours. Meanwhile the states and their governors are spurring the movement for more and more electric power. Among the outspoken governors on this subject are Peterson of Nebraska and Bonner of Montana, ably abetted in the past by former Governors Mickelson of South Dakota and Aandahl of North Dakota. Interagency has undertaken an exhaustive study of the question.

The possibility of low dams to provide slack-water navigation from the mouth of the Missouri to Yankton, South Dakota, has been suggested by the President's Water Resources Policy Commission. The commission said this would furnish an additional 2,200,000 kilowatts of electric capacity.

This assertion by the policy commission was part of a "tentative list of hydro-electric power possibilities other than at projects under construction, authorized, and recommended or contemplated." The list, dealing with numerous large and small streams scattered throughout the Missouri basin, showed a total of 5,733,450 kilowatts of possible generating capacity, in addition to the Interagency plan, but including the 2,200,000 kilowatts mentioned in connection with downstream navigation. The commission said that the average annual generation from this additional potential power could be 29,209,545,000 kilowatt hours. If it should prove to be possible and feasible to add to the present Interagency plan all the power thus suggested by the commission, the total capacity would be increased to 8,924,000 kilowatts. It can readily be seen that here the

commission opened up a delicate and highly important question. This showing is virtually certain to raise sooner or later the issue of whether the Interagency plan is going anything like far enough in its power aspect.

INTERNATIONAL WATERS

Plans of the Bureau of Reclamation call for a diversion of water from St. Mary Lakes, in Glacier National Park, to irrigate land along the Milk River in Montana. The lakes normally drain into a Canadian river of the same name, which is in the Hudson Bay watershed, while the Milk is a tributary of the Missouri. The project, a relatively minor one, is described by the bureau thus: "The irrigation plan of the Milk River project provides for the storage of St. Mary water in the Sherburne Lakes reservoir and its diversion through a canal 29 miles long, heading three fourths of a mile below Lower St. Mary Lake and discharging into the north fork of Milk River, thence flowing through Canada for 216 miles before returning to the United States." An international treaty dealing with the waters of the two streams was signed in 1909, but there has recently been considerable dispute about other streams in the vicinity, just beyond the Missouri basin, and an international joint commission has been investigating. The implications of international difficulty here are even greater than the troublesome and highly controverted questions of states' rights in water that are encountered throughout the western part of the basin.

CHAPTER XIII

MVA: Hope or Bugaboo of the Basin?

A VAST amount of bunk and baloney has been spoken and written about the long-standing proposal for a Missouri Valley Authority—the MVA. Mostly this has come from its opponents and detractors, but occasionally its more enthusiastic backers have gone a bit overboard in their claims for it. MVA has been attacked as a piece of rank socialism, a totalitarian supergovernment, a raw attempt at nationalization of the proper spheres of private enterprise, a threat to states' rights, a prime example of the evil machinations of the Rooseveltian New Deal. Perhaps some orators may have gone so far as to link it with the asserted horrors of the Trumanic Fair Deal, but there would not be much point to that, as the record indicates plainly that President Truman has scarcely given MVA a pious morsel of lip service. On the other side of the shield, MVA has been upheld as a fine, practical application of democracy in action, a means of regional home rule, a saver of public money, a conservator of priceless natural resources, the exact opposite of ruthless, entrenched national bureaucracy, and the logical outcome of the successful Tennessee Valley Authority precedent.

Out of this welter of fact and fancy has grown a sharp controversy. The issue has been forced to be, in effect, not whether the present form of basin management should be

changed for the new one proposed in MVA, but a basic conflict of politico-economic philosophy: Liberalism *vs.* Conservatism. The fact is that the essential difference between MVA and the existing Interagency system is one of administration or management. Under MVA there would be a single, unified management, whereas Interagency is a voluntary confederation of independent departments having separate and even conflicting responsibilities. While physical plans might be changed if MVA were to take over, such change would amount to application of the unified administration.

One persistent argument has been that TVA may be all very well for the compact, homogeneous countryside of the Tennessee Valley, but that its virtual counterpart, MVA, never could work in the far-flung, heterogeneous Missouri Valley. This argument does not hold much water: management principles could be applied regardless of the geographical variations within a region. The growing realization of the unity of river valleys and of the propriety of planning and developing uniformly throughout a major watershed has served to help knock out this argument. A key step for an MVA was a long editorial, "One River—One Problem," in the *St. Louis Post-Dispatch* of May 14, 1944.

The late George Norris worked from 1918 to 1933 to make TVA a reality. He had the powerful backing of President Roosevelt. F. D. R. was on record also for MVA, and told Congress, when the Pick-Sloan plan was made law, that he did not desire this to interfere with the eventual realization of MVA. Meanwhile, Mr. Truman, as Vice President, was accused by MVA supporters of referring the

second MVA bill to hostile senatorial committees. That was in 1945. A succession of bills followed but languished, the fourth one being introduced in 1949. Sponsors proposed to try again in the Eighty-second Congress, convened in 1951, but with no actual hope of success in that session. They did not hurry, considering the introduction only a gesture, at least for the current session. Their idea was that any time before the session ends late in 1952 would be soon enough, but that they might act before the close of 1951.

Senator Murray of Montana, a Democrat and a liberal, has been the chief congressional backer of MVA. He introduced the earlier bills and, for a time, made strenuous efforts to push them through. Unable to obtain official congressional hearings in the basin, he conducted a set of informal hearings of his own in Montana in 1947. He is independently wealthy, and his whole background stamps him as anything but a radical, though he has backed labor measures and the Fair Deal scheme for medical care. For the 1949 bill he was joined as author by fifteen other senators, including Senator Langer of North Dakota, a Republican, and such Senate leaders as John J. Sparkman of Alabama and Estes Kefauver of Tennessee, both Democrats. Also among the sponsors taking a leading part with Senator Murray were Senator Humphrey, the fiery ex-mayor of Minneapolis, and Senator Guy M. Gillette of Iowa. MVA has not had too many congressional friends: among them, however, have been the late Representative John J. Cochran of St. Louis, a power on the Democratic side, and his successor, Frank M. Karsten, also a Democrat.

Addressing the Senate as the 1949 bill was introduced, Senator Murray said of the Missouri Valley: "Not only is

this great river basin our last remaining untapped reservoir of raw resources needed for defense, but its potentialities for the development of vast amounts of essential civilian products are so great as to offer a new economic frontier for the use of our capital, our unused manpower, and the utilization of our genius as optimistic, enterprising Americans."

Continuing, the Montanan said that he and Senators Humphrey and Gillette had visited President Truman a short time previously "and found him enthusiastically supporting this most beneficial legislation." He added that policy-making officials of both the Department of the Interior and the Department of Agriculture were on record in favor of MVA. (Neither department actually has made any positive effort to bring about creation of MVA, however, but the Bureau of the Budget has shown a friendly stand, and has said that the general objectives would not be in conflict with the President's program.)

Some MVA backers talked of changing the last part of the title from "Authority" to "Agency" because of the bad repute of the authoritarian idea. At one point Senator Murray switched the title, but then changed it back to the original because some supporters feared that the belief might arise that there was some retreat from the original concept. The 1949 form of the bill represents the MVA idea well, having embodied some refinements to meet criticisms of earlier drafts. Thereafter there was talk of some further change to qualify the proposal as a governmental reorganization bill, with the hope this might help steer it to friendly committees. Meanwhile other demands on Senator Murray,

notably his appointment as chairman of the Senate's important Labor and Public Welfare Committee, tended to hamper his support of MVA.

Senator Murray's speech on presenting the 1949 bill included a synopsis of its provisions, which may be further condensed as follows:

Headquarters and branch offices of MVA would be within the region. Management would be vested in a board of five directors, at least three of them residents of the Missouri basin for at least five years. They would employ a general manager.

The first duty of MVA would be to prepare a comprehensive plan for unified development of the region in keeping with policies laid down in the bill. The plan would require congressional approval before funds would be provided or construction work begun. Prior approval of the plan would be required from an advisory board. Members of this board would be twelve citizens representing interests of agriculture, commerce and industry, labor, and wildlife and recreation; also the principal officer of each of the federal departments of Agriculture, Interior, Commerce, Justice, Army, and Labor, and of the Federal Power Commission and the board of governors of the Federal Reserve Bank; also the governors of the ten Missouri basin states. These governors, in addition, would form a special advisory committee on federal-state relationships.

Projects for which authorizations and appropriations were provided prior to MVA would not be delayed or dropped, as they would have to be incorporated into the MVA plan. [Thus the further the Interagency program proceeds in construction, the less likelihood of any material change in the basin plan should MVA be adopted.]

Interests of the respective states in their watersheds and their water rights would be protected under the bill, which "recognizes the existence of an important body of law affecting the public lands, irrigation, reclamation, grazing, geological

survey, national parks and monuments, mines and mineral holdings, and forest land that must not be affected in any manner."

Existing governmental agencies would be drawn upon to assist in MVA undertakings through contracts providing for them to handle projects for which they are especially qualified. [Thus the Army Engineers, the Bureau of Reclamation, and the Department of Agriculture might be left handling much the same functions already assigned them, but subject to the unified management of a single, over-all administrative agency.] State and local agencies might also be called on to assist in MVA's work.

The rule of the O'Mahoney-Millikin amendment to the Flood Control Act of 1944 would be preserved, giving the upper basin prior claim to use of water for irrigation and other consumptive purposes. The idea of the family-size farm, basically 160 acres, would be followed in the allowance of water for irrigation.

Electric power could be sold by MVA only at wholesale, except that retail sales could be made to farms and rural communities "not adequately served by existing utilities at reasonable rates."

All funds for MVA would have to be provided by Congress, and profits from operations would go to the federal treasury, so that direct appropriations would have to be made by Congress for all construction.

Payments to state and local governments in lieu of taxes, at least equal to the ordinary yield of property taxation, would be made by MVA on its holdings. The anticipated effect would be to increase income of state and local governments as values rose under the impetus of improvements.

Thus ran the descriptive account of the MVA proposal given by Senator Murray to his colleagues. The 1949 version of the bill gave increased strength to the provisions for representation of the states and for protecting rights of the

states. It also increased the number of MVA directors from three to five, to be appointed by the President with the advice and consent of the Senate, and with presidential designation of the chairman. MVA would be in the realm of wholly government-owned corporations.

What does the other side of the dike have to say about this proposition? One of the strongest pressure groups interested is the Mississippi Valley Association, with headquarters in St. Louis. It was started largely to promote navigation on the Mississippi many years ago, and in later years has spread its interest to general questions in both the Mississippi and the Missouri valleys. Its *Mississippi Valley News Letter* for March 1949 had this to say about the Murray bill for MVA:

"The new bill goes far beyond the provisions proposed in the previous MVA measures. The new powers sought would establish precedents which would profoundly affect the form of government under which this country has prospered for nearly two centuries. The broad grants of authority which are sought in the bill exceed the powers given to the Tennessee Valley Authority. In most incidences [*sic*], these powers would establish precedents of serious import to the nation. The bill, for example, confers upon the Authority to be created broad powers of eminent domain. . . . It can logically be construed . . . that the Authority has the legal right to condemn and sell any land or property in the Missouri basin on the sole ground that the profits would be used in the furtherance of its plans. . . .

"If adopted, the Murray bill would establish the precedent that the federal government should nationalize the electric power industry. The bill specifically grants to the

Authority the right to 'build and operate' steam electric generating plants. This is the right now sought by TVA in its request for money to build a steam plant at New Johnsonville, Tennessee. [*Note:* Congress later gave TVA that right.] In both instances, once the precedent is established, the door is open for the nationalization, not only of electric power, but of all public utilities.

"The bill seeks complete independence for the Authority. It would specifically free MVA from all restrictions relating to the control of the waters of the Missouri flowing into the Mississippi. This basin independence does not apply to TVA. . . .

"While the title of the bill stresses 'water control and resources development,' it is significant that the measure is so worded that its provisions may be construed to give the Authority control over all resources of the Missouri basin, including minerals. This is another instance in which the powers proposed exceed those given TVA. In fact, as lawyers who have studied it point out, it is seldom that in its provisions it can be said that the powers of the Authority go so far and no further. In at least 27 instances the grants of power are limited only by the phrase as the Authority 'deems necessary.' . . .

"It is reasonable to assume that Congress would be asked to decide upon a relatively general plan, which would give the Authority carte blanche insofar as the details are concerned. This interpretation is supported by the broad powers to be granted the Authority in other sections of the bill."

There you have it: advocates of MVA say it would give

a reasonable, economical, and democratic management for the benefit of the people, doing away with existing bureaucratic conflicts; enemies insist it would be an unreasonable, wasteful imposition, socialistic or worse. Supporters declare that MVA would be fully controlled by Congress; opponents argue that existing procedures of checks and inquiries would be ditched, once Congress voted funds. Like most things in this world, this conflict is neither all white nor all black; there are grays, overtones, shadows. Objective consideration may very well lead to the conclusion that MVA would offer desirable improvements in the situation, but that the proposal might properly be subject to reasonable limitations. There is no reason, for instance, why the powers should not be so sharply defined as to eliminate criticisms. Some of these criticisms seem pretty far-fetched, yet there is no point in leaving in the proposal uncertainties that might conceivably open the way to radical action. After all, Congress, like the Almighty, can take away as well as give; an MVA statute could be repealed or amended to meet the will of the people. The Tennessee Valley Authority has operated successfully for almost two decades with widespread support among the people of its region, and there has been no occasion for Congress to trim TVA's powers.

Who is for MVA? Notable supporters have included the following:

The Congress of Industrial Organizations, nationally and regionally.

The American Federation of Labor's national executive council.

Construction trades of the American Federation of Labor, especially in the region affected.

The National Farmers' Union, which is strong in western states of the basin.

The Missouri Farmers' Association, by far the largest agrarian group in its state and perhaps in the region; it is generally conservative in character.

The strong, persistent editorial voice of the *St. Louis Post-Dispatch.*

The membership of the vigorous and usually conservative St. Louis Chamber of Commerce as expressed by a slim majority in a specific poll, the result of which was not set aside in spite of strenuous efforts by opponents.

The Democratic Midwest Conference, which met at Des Moines, Iowa, in 1949, as expressed by a mild resolution adopted over some opposition.

The weak Progressive (Wallace) Party of Missouri, in its 1948 platform.

Reasons for the support of MVA by this divergent set of forces coincide with virtually no exception. All of the supporters arrived at the same conclusions by independent action. Their reasons can be summarized as follows:

They feel that MVA could do a more efficient and successful job than Interagency in flood control, power production, soil conservation, irrigation, and the other basic needs of the valley.

They hope that MVA may evolve a plan that would reduce the size of the big reservoirs and take less bottomland out of cultivation.

They are convinced that MVA would serve better than Interagency to provide more jobs, more and cheaper electric power, more food, more industrial development, a better chance for national defense plants to move in, improved regional markets, and higher living standards.

They maintain that MVA could be expected to protect and exploit natural resources for the benefit of the whole public in more whole-hearted fashion than existing agencies.

They have found that TVA has enjoyed an excellent record of labor relations, and they believe MVA would duplicate this.

In fine, they are moved by a spirit of social and economic consciousness.

Who opposes MVA? This list is virtually equivalent to that of the supporters of the present Interagency method. It includes:

Many of the major privately owned electric utilities, acting in concert in their national advertising, and some utilities acting individually in the Missouri basin. The costly national advertising by the group describes these utilities as "America's *business*-managed, taxpaying electric light and power companies."

The National Reclamation Association, the pressure group of irrigation interests.

The Mississippi Valley Association, interested primarily in navigation and flood control in the lower Missouri River and the Mississippi, and in soil conservation.

The Chamber of Commerce of the United States, which is regarded as a leading spokesman for big business.

The National Rivers and Harbors Congress, a powerful lobby for the Army Engineers.

Heavy-construction contractors, particularly through their national organization, the Associated General Contractors, and its state branches.

The Missouri Farm Bureau Federation, a unit of the right-wing national federation.

Railroads of the region, at least indirectly; they do not speak out openly on the issue, but their sympathy with Interagency has been made evident.

The *Kansas City Star*, the *Omaha World-Herald*, the *St. Louis Globe-Democrat*, and various lesser newspapers, all with Republican or conservative leanings.

Representatives of some livestock, lumber, and oil interests.

Miscellaneous groups that like the present method of dealing with flood control and navigation.

State administrations of most, if not all, of the basin states. Montana's administration comes fairly close to favoring the MVA side, but actually stops short of that and instead supports Interagency. Missouri, often showing doubts about Interagency, nevertheless is tacitly against MVA. Strongest in support of Interagency and therefore against MVA are Nebraska, North Dakota, South Dakota, Wyoming, Kansas, and Colorado.

Like the supporters of MVA, the opponents all have pretty much the same sets of reasons for their stand. Their objections to MVA can be summarized as follows:

MVA would be a new and objectionable "supergovernment," with autocratic authority.

It would threaten the sovereignty of the states and encroach on their jurisdictions.

It would be a new step toward socialism, a surrender of democratic rights and checks.

It would put the government into business more than ever—especially the power business.

It would disrupt established and time-tried methods of operation and interfere with accepted methods of financing and of dealing with Congress and federal departments.

The region is accustomed to dealing with the existing agencies and does not want to upset the mutual understanding with them.

Special interests have special reasons for opposing MVA: for example, the contractors fear that MVA would not deal with them; the railroads oppose river navigation; the power com-

15. *Casper, Wyoming, in the heart of the oil country.*
Ken, Industrial Development Association of Central Wyoming.

16. *Billings, Montana. In the background, the Absaroka Range, approach to Yellowstone Park.*
K. F. Roahen.

panies want to keep the electric business in their hands; some grazing, lumber, and oil interests fear MVA might interfere with their pursuits.

In short, the opponents of MVA prefer the *status quo*.

Organized support for MVA was concentrated in the Regional Committee for the Missouri Valley Authority, a lively pressure group in the mid-1940's, since moribund and now virtually defunct. Proponents gathered under its auspices because it was a centralized movement with enthusiastic backing. Its main drive came from the National Farmers' Union, the CIO, and the AFL construction trades. Among persons it attracted were economic and political liberals. Philip Murray, head of the CIO, was particularly outspoken and active in support of MVA, and the CIO was a principal source of funds for the organization. William Green, head of the AFL, also came out publicly for MVA. As last announced, about 1947, officers of the Regional Committee for the Missouri Valley Authority were: chairman, Benton J. Stong, now a Washington representative of the National Farmers' Union; vice-presidents, Al F. Kojetinsky, St. Louis, district director of the CIO United Steel Workers, and J. O. Mack, president of the AFL Carpenters' District Council of Kansas City and Vicinity; secretary-treasurer, John E. Wetzig, Kansas City, an international representative of the AFL International Brotherhood of Electrical Workers; working committee members, Jerome G. Locke, Helena, Montana, a civil engineer; Leroy Sabie, Pipestone, Minnesota, manager of an REA co-operative; and James A. Davis, St. Louis, executive secretary of the CIO Missouri Industrial Union Council. Activities of the regional committee folded up when con-

tributors quit contributing as the outlook for MVA in Congress seemed to grow dimmer.

The nearest to a centralized organization of the MVA opposition is the Missouri Valley Development Association. Its executive director and guiding spirit is John B. Quinn, of Lincoln, Nebraska, an ebullient and irrepressible man. He is a public-relations counselor, operator of an automobile insurance agency, and farmer, who also has conducted political campaigns for Republican office-seekers and campaigns on public questions. From time to time he has said that he has telegraphed articles about Interagency meetings to the *Denver Post*, *Omaha World-Herald*, and newspapers at Hastings and Alliance, Nebraska. Mr. Quinn says that his organization is supported by contractors, farmers, ranchers, chambers of commerce, and others—but not by electric utilities or railroads. He says that the electric utilities cannot be counted on as supporters of Interagency. Mr. Quinn has been on good terms with officials of the Army Engineers and of the state of Nebraska. In 1946 Mr. Quinn and T. B. Strain, president of a bank at Lincoln and then treasurer of the Missouri Valley Development Association, said that construction contractors had been the largest source of funds for the association. Contractors generally have favored the Interagency method because the Army Engineers and the Bureau of Reclamation usually build their projects by contract; they have feared that MVA would do its own building, as TVA has done. Carl Fredericksen, president of a bank at Sioux City, Iowa, has been chairman of the association.

Senator Murray has charged that private electric utilities have waged a propaganda campaign against MVA

through "front organizations with high-sounding names." He asserted that MVA would promote private enterprise, not retard it. The Senator has been told by Leif Erickson, a former judge of the Supreme Court of Montana and former chairman of the Regional Committee for MVA, that the opposition to MVA would disappear "overnight" if the bill were amended to deliver all electric power to the private utilities at the dams.

CHAPTER XIV

Background for Prediction

VALLEY regionalism is an accomplished fact. The question before the nation is how best to handle it. Running water is no respecter of state sovereignty; management of a region's resources transcends the existing political boundaries. It makes sense to unify in some manner the planning, construction, operation, and administration of regional facilities. A major watershed, like the Missouri, is a natural region. In the Missouri basin the broad objectives of the existing plan are beyond cavil, even if some specific purposes may be open to question. The broad objectives of controlling and utilizing the water, the land, and the underground treasures would be the same under any form of management.

The published and otherwise recorded arguments over Missouri Valley direction could easily fill the traditional five-foot bookshelf. For every argument on any side a counter-argument exists.

The Engineers Joint Council, representing the national engineering societies, spoke harshly in 1950 of the existing method of planning. It declared:

"From an engineering standpoint the planning and execution of the Missouri basin program is almost entirely backward. The engineering features contained in the program were planned by various agencies restricted by law to

limited objectives. The geographic spheres of operational activities are as arbitrary as a degree of longitude, although rigid and unyielding to geographic and land utilization characteristics. Such characteristics and the needs of the basin were ignored in determining which agency would develop the water resources in a particular part of the basin. The program was authorized by Congress in haste and without appropriate public hearings in the basin. The severe floods of 1943 and 1944 were stated to be the prime motivator of the [Pick-Sloan] authorization, although the plan, had it been in operation, would have contributed little to the alleviation of the storm and physical conditions that produced these floods. Time of the authorization was opportune for such action. Little attention could be given to the organizational structure of competing federal agencies because Congress was faced with the pressing considerations demanded in the winning of the war. A detailed and systematic inventory of the resources of the basin was not available in the planning stages. Such an inventory has not been completed today, as witnessed by field surveys being conducted by not less than five federal agencies and at least one committee of state agencies. . . . The agricultural, industrial and sociological problems of the Missouri basin were not studied prior to authorization. Specific projects were proposed and approved without regard or consideration of their effects on the economy, transportation, local government of counties, and general welfare of the people in the areas and adjacent regions of the reservoirs. Very serious conflicts continue to exist in the jurisdiction of overlapping geographic provinces, in the allocation of available waters for various functional uses, and

even in the allocation of portions of reservoirs' capacities for functional uses. This lack of integration is readily understood and was inevitable when such a dearth of data was available and when so little planning and co-ordination preceded authorization."

The remedy proposed by the Engineers Joint Council, which presented its views to the President's Water Resources Policy Commission, was to create a statutory federal agency, made up largely of non-governmental personnel, to review and diagnose water-resource developments. This idea paralleled one advanced earlier by the Hoover Commission on Governmental Reorganization and espoused by the later presidential commission.

Authorization of the Pick-Sloan plan was made by Public Law 534 of the Seventy-eighth Congress, second session —the Flood Control Act of 1944. An uninitiated reader could hardly be expected to recognize this, however. The text of the act deals mainly with a variety of individual flood-control projects scattered all over the country, while the opening section is a confusing statement of policy, containing, among other things, the O'Mahoney-Millikin amendment to protect the West's water. When you get to Section 9(a) you find the actual enactment of Pick-Sloan; namely: "The general comprehensive plans set forth in House Document 475 and Senate Document 191, Seventy-eighth Congress, second session, as revised and co-ordinated by Senate Document 247, Seventy-eighth Congress, second session, are hereby approved and the initial stages recommended are hereby authorized and shall be prosecuted by the War Department and the Department of the Interior as speedily as may be consistent with budgetary require-

ments." House Document 475 was the Army's Pick plan; Senate Document 191 was the thick statement of the Bureau of Reclamation's Sloan plan; Senate Document 247 was the reconciliation of these two as the Pick-Sloan plan, the so-called "shotgun wedding."

Although the planning of the present program has been vigorously defended by its sponsors, who have asserted that as many data were available for the basis of planning as could be expected to exist, complaint over the methods now in vogue has continued. Soon after the neighboring Interagency committee for the joint basins of the Arkansas, White, and Red rivers was formed, that body was told by John M. Dewey, state water engineer for Missouri: "Our experience in the past in river basin planning is that the word 'comprehensive' has been used too loosely. It is an established procedure and policy of the federal government to plan river basin programs in terms of flood control, navigation, or irrigation, with the other phases of the program being considered as secondary. Too frequently we find that the secondary interests in a project are of major importance when the benefits attributed to such a project are analyzed. Unless we are willing to recognize this and so declare ourselves it seems futile for the states and the federal government to continue spending time and money to develop river basin programs that are limited."

The Corps of Engineers, the Bureau of Reclamation, and the Department of Agriculture are backed by strong lobbies. The areas and interests that benefit from the operations of these agencies fight for them and for the *status quo*. Only recently Chairman Carl Vinson of the House Armed Services Committee told another congressional

committee that the Army Engineers should be exempted from a bill for emergency governmental reorganization. He said: "We had better leave the Army Engineers alone. They are a little bit too powerful and we shy away from them. That's the lowdown." Although some of the higher officials of the Department of the Interior have supported the valley authority idea, there has been no sign that either the subordinates in the Missouri basin or the lobby for the Bureau of Reclamation agreed with this.

One of the big difficulties under the present method of dealing with the Missouri Valley has been the necessity of consulting a whole set of separate committees in each house of Congress. In general this cleavage follows the lines of the various federal departments involved. The valley has recognized the problem and through the Missouri River States Committee membership has tried to have a single Senate committee and a single House committee designated to pass on the watershed program. The endeavor has been unavailing. In contrast, any form of unified agency for this watershed would presumably be handled by single congressional committees.

Senator O'Mahoney, Wyoming Democrat, and a Western leader in the Senate, once took occasion to visit an Interagency meeting and sound a warning that Congress intended to retain over-all planning authority for the basin. He was critical of the planning then being done, and said: "The truth of the matter is you are now working on plans without authority." At the same meeting a regional director of the Bureau of Reclamation remarked, in the course of a discussion of electric power: "I just want to remind the

committee that I do not receive my marching orders from the committee."

Both Mr. Sloan and Governor Peterson have publicly raised the issue of who will turn the water on or off when the operational stage is reached. By this is meant: who will be the water master, the arbiter between the Bureau of Reclamation and the Army Engineers, and perhaps between those agencies and the states or the Department of Agriculture, when it comes to deciding whether water shall be held back of the dams or turned loose for one or more uses? Enthusiasts for the present setup feel sure some sort of proper operating agreement can be worked out. Skeptics wonder. Governor Peterson frankly expresses concern in urging that an organization with definite power be established to handle this and kindred functions.

In the 1949 report of the Hoover Commission on Governmental Reorganization, a majority of its members recommended transfer of flood control and rivers and harbors work from the Army Engineers to the Department of the Interior. This was part of their general proposal to concentrate all forms of governmental construction work in that department. The commission's suggestion came after one of its major task forces, on natural resources, had urged creation of a new department of natural resources to include such activities as those of the Bureau of Reclamation and the civil functions of the Army Engineers. Leslie Miller, who was chairman of this task force, took to the stump in support of its views. So much agitation resulted that Interagency and the Missouri River States Committee were seriously disturbed. The big guns' aim

was shifted from MVA to the task force, which was roundly denounced at every river meeting for some time. This resulted from fear the attack might adversely affect appropriations. One funny aspect of the situation was that Mr. Miller was charging that the Army Engineers and the Bureau of Reclamation by their actions were "taking this country down to socialism." This contrasted with the usual theme of MVA opponents that MVA is socialistic and Interagency the essence of democracy. But Mr. Miller had no use for MVA either. He found a supporter for the general principle of a new single department in Senator O'Mahoney.

Next the cudgels were taken up by the President's Water Resources Policy Commission, headed by Morris L. Cooke of Philadelphia and Washington, D.C., and with a membership of liberal tinge. This commission, in a series of three documented reports issued in December 1950 and February 1951, called for adoption of a unified national policy in water-resource development. It advocated "the maximum sustained use" of the nation's water "to support a continuing high level of prosperity throughout the country." The objectives listed for the nation as a whole apply particularly well to the Missouri Valley. They are: "Safeguarding of our resources against deterioration from soil erosion, wasteful forest practices, and floods; the improvement and higher utilization of these resources to support an expanding economy and national security; assistance to regional development; expansion of all types of recreational opportunity to meet increasing needs; protection of public health; and opportunity for greater use of transportation and electric power."

The commission then recommended that programs submitted hereafter deal with river basins as units. At this point it took up the problem of administration, making its own suggestion: an officially created river-basin commission to deal with each major watershed. It would have Congress order the various federal agencies to co-operate with each other and with the states in surveys and plans. The report continued: "These commissions, set up on a representative basis, should be authorized to co-ordinate the surveys, construction activities, and operations of the federal agencies in the several basins, under the guidance of independent chairmen appointed by the President and with the participation of state agencies in the planning process. Congress should designate the federal departments and independent agencies to participate in the river basin commissions. Such participation should provide for representation of all agencies with functions included in water resources programs. Congress should assure all such agencies adequate authority to participate in comprehensive planning on an equal basis, together with appropriations consistent with such participation."

Notably, the Cooke commission called for completion of projects now under construction as rapidly as the national emergency permits, but added: "Construction should be initiated on additional projects only as they are clearly shown to be in conformity with revised and approved basin plans, or as they are required to meet the emergency. The review of basin programs and the collection of necessary data should be pushed as rapidly as possible. Among the new projects to be considered for initiation, first priority should be given to safeguarding

present and future projects, as, for example, by reducing sediment or recharging depleted ground waters, as well as to developing new regional activity, as, for example, by the production and distribution of electric power."

An incidental comment in the commission's report cited one weakness in the present Missouri basin setup. It said: "Certain responsibilities concerning land utilization are vested in both the Bureau of Reclamation and the Department of Agriculture, the division being unclear." It asserted that some Reclamation and Army plans overlapped and "in the area of overlap were also divergent."

The commission listed as one of the principles for reformulating water-resource policy the following: "The necessity of planning for a river basin as a whole instead of having a patchwork of plans by separate agencies for separate purposes." The statement went on: "This will assure the most harmonious development of the water resources of the basin, enabling them to make their greatest contribution to the welfare of the people. The motto must be 'one river, one plan.' "

In its introductory statement the commission gave some basic ideas, which, if heeded, may well revise the nation's thinking. It said:

"We have used water badly, without proper respect for its natural cycle, turning it from a friend to an enemy. We have destroyed forests, leaving barren, denuded mountainsides from which rain water and melting snow pour unchecked; we have overplowed and overgrazed our lands; we have dangerously increased soil erosion, allowing precious topsoil to be carried to the sea, muddying our streams, filling up our reservoirs, and increasing the damage

from floods. . . . Now, midway in the twentieth century, two facts have become compellingly clear. The first is that water is limited in relation to the many and varied needs for its use. These needs will grow in size and complexity as the population grows and as industry develops. More water for domestic use is needed by our growing towns and cities. More water must be used to bring new lands into production in the West. New industrial techniques, such as those developed in the chemical industries, synthetic fuel production, and the harnessing of atomic power, bring with them increased demands for water. . . . The second fact we can now see clearly is that the management, conservation, and use of our water resources is inextricably bound up with the management, conservation, and use of our land and that both are essential to our expansion as a nation. Floods cannot be controlled by building higher and higher levees, or permanently by building dams, if other things are neglected. The big streams are fed by small streams, and water control inevitably leads us back to the proper conservation of forests and agricultural land. The farmer who holds the rain water by terracing his fields, the group of farmers who band together to form a soil conservation district, play an indispensable role in water management. The preservation of our forests, our mountain lakes and streams, and our wildlife sanctuaries has ample justification in providing healthful sport and recreation for the refreshment of the human spirit; but it is also an essential part of water conservation and management. In short, if we do not manage and conserve water, we suffer losses, some of them irreparable, in our natural resources. If we do not manage and conserve these other resources,

we shall lose the usefulness of our water: it will rush to the sea, robbing instead of enriching us."

Unified responsibility must be applied to the planning of multiple-purpose, basin-wide developments, said the commission. It added: "This need not be in accordance with the Tennessee Valley Authority pattern as far as organization is concerned. But it must take advantage of what the country has learned from that experiment in unified development of the water resources of basins. There is today no single, uniform federal policy governing comprehensive development of water and land resources. Some statutes of uniform application separately control various aspects or functions. Others are geared to a comprehensive approach, but focus attention on individual projects, specific areas, or single river basins. . . .

"When multiple-purpose dams are built with federal funds, the federal government enters the field of economic enterprise. The justification for this is beyond question. No other agency can command sufficient capital resources or provide the co-ordination necessary for the construction of these great programs. But government enterprise does not in any way supplant private enterprise. Rather its purpose is to create the over-all conditions, the framework, in order to provide the opportunity for the further expansion and healthy functioning of a free, competitive economy. In other words, 'planning' in the American sense means planning to maintain and strengthen free competition. Where natural monopolies exist, therefore, it is in accordance with the American system that the government should itself provide competition, if this is deemed necessary to

insure its benefits, as for example by providing low-cost and abundant power. But it is not in accordance with the American system, nor is it any part of the purpose of the plans for water development proposed in this report, that the federal government should itself become a great monopolist."

The commission was critical of the Interagency system as being insufficient and lacking in authority. It said that the program thus far necessarily was characterized by a "piecemeal approach." It showed the existence of an amazing set of confusions, duplications, and omissions in the federal water laws placed on the books successively throughout most of the nation's existence.

Ink was not long dry on the commission's report before attacks on it began. Governor Peterson told a Mississippi Valley Association convention at St. Louis that good things in the report outweighed the bad, but that he had five specific criticisms. Summarized, these objections were: (1) "The commission has a definite and consistent bias for an authority in all river valleys. We don't want that in the Missouri basin. We'd like the control of development of our basin in our own hands." (2) "The report reflects a planned-economy approach that characterized the era of the 30's—the brain-truster approach. It speaks a great deal of planning with broad social aims. The Missouri basin doesn't want some one planning for it." (3) "It provides for state participation only on an advisory basis; it says if we can't have an authority, we should have a pepped-up Interagency approach, headed by a chairman appointed by the President, with only an advisory committee for the

states." (4) "The report is vague in the economic justification of projects, the allocation of costs to various functions, and in the reimbursement provisions." (5) "It talks of co-ordination of national transportation services—everything: railroads, air lines, trucking, and waterways—with all rates fixed on actual costs. I don't see how you can do that without nationalizing transportation."

Allocation of costs among various functions of a water project, such as, say, flood control, irrigation, and electric power, has long been a bone of contention. Weighty tomes could be written on that subject; the solution is beyond the scope of this volume. The Tennessee Valley Authority has been attacked and defended repeatedly over its capital cost allocations. The same attack has been leveled at the MVA proposal. As a matter of fact, it can be raised with equal force against the Interagency system. Economic theories also clash in the sphere of reimbursement by beneficiaries of public facilities, such as irrigation. The Cooke commission argued for "a uniform national reimbursement policy."

When Harold Stassen stumped Nebraska in March 1948 in his effort to win the Republican presidential nomination, he devoted a large part of a major speech at Omaha to the Missouri basin question. He said that he was opposed to the MVA method, but favored establishment of "a definite Missouri valley region" to handle development. His idea was that each governor should appoint a member of the governing board. He continued: "The federal government should then make a contract with this regional board, turning over the management of the completed projects of hydro-electric, irrigation and reclamation, and water

resources in exchange for a reasonable portion of the revenues derived until such time as the investment is repaid. . . . It is essential that there be some kind of over-all administration to keep the whole inter-related resources developing and utilized in a sound manner. But that over-all agency should arise from the states, rather than be handed down by the federal government. I am confident that under the precedents that have been established in the Colorado River cases and in the Supreme Court decisions . . . an administrative board developed by the states can be given authority by the federal government to administer completed dams and projects of this kind."

Late in 1949 Governor Peterson broached the proposal for an interstate compact of the ten Missouri basin states to set up a new administrative agency—the "water master" idea. This was launched at a meeting of the Missouri River States Committee by way of a speech by C. Petrus Peterson, past president of the Nebraska Reclamation Association, a director of the National Reclamation Association, lawyer, and former state senator. He argued for management under a compact, but for leaving the planning and construction to the existing federal agencies. The action of the Missouri River States Committee was to call on the Council of State Governments to delve into the matter. A year later the states' committee received a sketchy statement of underlying principles from representatives of the council. This did not mention the compact idea, and spoke only of water resources. The committee called for further study by the council's specialists, with the tacit understanding that soil control would be included in any final action, but it did not appear that the compact idea had gathered

much support. Nevertheless, Governor Peterson has continued to hammer away publicly at the need for some stronger management when the operational stage is reached. His views are significant: he is not only an Interagency member, but also the chairman of the states' committee and as such is implicitly the leading spokesman for the basin.

Frank Bane, executive director of the council, a clearing house for all forty-eight states, pointed out in reporting to the Missouri River States Committee that the study being made by the council staff dealt with needs of the Missouri Valley alone, not of all river valleys. He said the interstate compact idea would be taken under consideration. Mr. Bane offered three "yardsticks" for guidance of the continued study. As to the first of these, he said: "Since the basin-wide system of water facilities is closely interwoven, it follows that a high degree of unity of operational policy should characterize the management of the basin's [water] storage facilities. How best to achieve the degree of operational unity needed in the basin is a matter for serious concern. Experience indicates that a higher degree of unity of policy can be attained if responsibility for over-all operation can be centralized."

Immediately some sensitive representatives of states were troubled over that word "unity." They feared that this suggested a grant of too strong centralized authority, and their semantic leaning was to substitute some such term as "co-ordination," which they have learned not to fear, that being Interagency's stated function.

Meanwhile, Raymond Moley, contributing editor of

Newsweek and professor of public law at Columbia University, has come out in support of the interstate compact as the solution of the needs of river-basin management. He was critical of MVA and other valley authorities. His views appeared in a copyrighted pamphlet, *Valley Authorities*, published by the American Enterprise Association, Inc., New York, which describes itself as "an educational and nonpartisan body" and is representative of business interests.

Spokesmen for major federal agencies operating in the Missouri basin have expressed fears over the effect of an interstate compact there. One has asserted that there is no need for anything but the voluntary Interagency method; another has argued that the compact method would fail when it reached the point of apportioning water among the states. A reading of the report of the President's Water Resources Policy Commission tends to dispute the latter point.

The views and recommendations of official, semi-official, and private sources concerning a change in management for the Missouri basin have been set forth in considerable detail in this chapter for a purpose. That purpose is to demonstrate that there is a feeling widely entertained, except among existing agencies selfishly interested, that something much better than we have now is seriously needed to handle wisely and well the multi-billion-dollar enterprise of making over this great region.

Beyond doubt, the states will demand a stronger voice in the regional administration. They have had a taste of this, first in a provision of the 1944 Flood Control Act

giving them a chance to object to development plans, and second in the operation of Interagency, within which the state representation started out almost as a conciliatory gesture by the federal agencies and has grown to be strong by sheer determination rather than by force of law.

The pattern of regional development throughout the country is quite likely to be set by the outcome of the great debate over the Missouri basin. Will there be an MVA, more TVA's? Or more Interagencies? Or a full scheme of interstate compacts, region by region? Or something else? If prognostication ever is safe, it would appear to be safe to predict that:

A centralized, unified, regional management of planning, construction, and operation will be set up by law in the Missouri basin.

It will provide for a positive participation by the ten states of the basin, but probably will include federal participation, and will be under some form of federal selection or authority.

It will utilize the skilled services of many existing federal agencies, either by direct designation or by assignment of personnel, but will have a single strong voice in requiring actual co-ordination without rivalries.

It will NOT *be a superstate, with powers going far afield.*

It WILL *be qualified and dedicated to meet the needs of modern regionalism on a logical, functional basis.*

When you analyze all this objectively, the fact is that the outlook is for something in the essence of American democracy: a fair compromise. The new agency, authority, commission, interstate union, or whatever it may be termed will not be satisfactory to the extremists on any

side—to either the more radical MVAers or the more conservative private-enterprise boys. Actually, it will not be greatly different in essence from an MVA shorn of some dubious elements. It might be what you could call an MVAAA: the Missouri Valley Anti-Authority Authority.

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A NOTE ON THE TYPE

The text of this book was set on the Linotype in ELECTRA, *designed by* W. A. DWIGGINS. *The Electra face is a simple and readable type suitable for printing books by present-day processes. It is not based on any historical model, and hence does not echo any particular time or fashion. It is without eccentricities to catch the eye and interfere with reading—in general, its aim is to perform the function of a good book printing-type: to be read, and not seen.*

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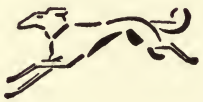

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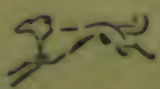

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