62D CONGRESS, 2d Session } HOUSE OF REPRESENTATIVES { DOCUMENT No. 738

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 295

GAZETTEER OF SURFACE WATERS OF CALIFORNIA

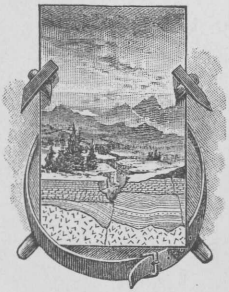
PART I. SACRAMENTO RIVER BASIN

PREPARED UNDER THE DIRECTION OF JOHN C. HOYT

BY

B. D. WOOD

In cooperation with the State Water Commission and the Conservation Commission of the State of California



WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

NOTE.

A complete list of the gaging stations maintained in the Sacramento River basin from 1888 to July 1, 1912, is presented on pages 98–99.

D. OF D.
SEP 25 1913

GAZETTEER OF SURFACE WATERS IN SACRAMENTO RIVER BASIN, CALIFORNIA.

By B. D. Wood.

INTRODUCTION.

This gazetteer is the first of a series of reports on the surface waters of California prepared by the United States Geological Survey under cooperative agreement with the State of California as represented by the State Conservation Commission; George C. Pardee, chairman, Francis Cuttle, and J. P. Baumgartner; and by the State Water Commission, Hiram W. Johnson, governor, Charles D. Marx, chairman, S. C. Graham, Harold T. Power, and W. F. McClure. Louis R. Glavis is secretary of both commissions. The reports are to be published as Water-Supply Papers 295 to 300 and will bear the following titles:

295. Gazetteer of surface waters of California, Part I, Sacramento River basin.
296. Gazetteer of surface waters of California, Part II, San Joaquin River basin.
297. Gazetteer of surface waters of California, Part III, Great Basin and Pacific coast streams.
298. Water resources of California, Part I, Stream measurements in the Sacramento River basin.
299. Water resources of California, Part II, Stream measurements in the San Joaquin River basin.
300. Water resources of California, Part III, Stream measurements in the Great Basin and in the Pacific coast river basins.

The gazetteers embrace descriptions of all the streams named on the best available maps. For the Sacramento basin these maps are chiefly those published by the United States Geological Survey as sheets of the Topographic Atlas of the United States. For districts along the western border of that basin, not yet mapped by the Survey, privately compiled and published county maps have been used. All township and range numbers have been determined from the county maps and all refer to the Mount Diablo base and meridian.

Each stream is described as rising near the point at which its beginning is shown on the map, and the elevation of that point is given as the elevation of the source. It is, of course, recognized that this method does not give results of great precision, but it probably causes no greater errors in the determination of length and fall than would be caused by extending each stream to the head of the divide

between its basin and that of the adjoining streams. It should be understood however, that all statements of elevation, length, and fall are merely approximate.

The Survey maps used in the preparation of the gazetteer of streams in the Sacramento basin are listed below in alphabetic order. An index map showing the area covered by each sheet may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Topographic sheets covering areas in Sacramento River basin.[1]

Alturas.
Bidwell Bar.
Carbondale.
Chico.
Colfax.
Colusa.
Courtland.
Davisville.
Downieville.
Dunnigan.
Elk Grove.
Fairoaks.
Florin.
Honey Lake.
Indian Valley special.
Knights Landing.
Lassen Peak.
Lincoln.
Lodi.
Marcuse.
Marysville.
Modoc Lava Bed.
Napa.
Nicolaus.
Placerville.
Pleasant Grove.
Pyramid Peak.
Red Bluff.
Redding.
Rio Vista.
Roseville.
Sacramento.
Sacramento Valley.[2]
Shasta.
Sheridan.
Sierraville.
Smartsville.
Tehama.
Truckee.
Vacaville.
Vina.
Willows.
Woodland.

County maps of Sacramento River basin.

	Publisher.
Butte County	Punnett Bros.
Eldorado and Amador counties	Do.
Glenn and Colusa counties	Do.
Mendocino and Lake counties	Do.
Napa and Solano counties	Do.
Nevada County	Do.
Placer County	Do.
Plumas County	Do.
Sacramento and San Jacinto counties	Do.
Sierra County	Do.
Yolo County	Do.
Yuba and Sutter counties	Do.
Shasta County	Denny.
Lassen County	Starkweather.

[1] An act of Congress approved Feb. 18, 1897, prescribes that the maps shall be disposed of by sale. They are sold at the rate of 5 cents a sheet of standard size. If 100 or more standard topographic atlas sheets, or their equivalent in value in other maps, are ordered, a discount of 40 per cent will be made from the retail price—that is, 100 standard topographic atlas sheets will cost $3.

[2] The price of the Sacramento Valley map is 15 cents; when included in wholesale orders, 9 cents.

GAZETTEER.

The letter L or R in parenthesis after the name of a stream indicates that the stream is a tributary from the left or right, respectively, to the stream into which it flows. The word "sheet" refers to Geological Survey atlas sheets.

Acorn Hollow Creek (L); rises in Tehama County, near the center of T. 25 N., R. 1 W., at altitude 400 feet above sea level; flows southwestward 2 miles, then north of west 1 mile into Toomes Creek (tributary to Sacramento River); fall, 150 feet. Vina sheet.

Adler Creek (R); rises in Shasta County, in the eastern part of T. 34 N., R. 5 W., at altitude 1,400 feet above sea level; flows southeastward 2 miles and joins Sacramento River at Morley; fall, 650 feet. Redding sheet.

Aiken Gulch Creek (L); rises in Shasta County, in the southwestern part of T. 29 N., R. 7 W., at altitude 1,000 feet above sea level; flows southeastward 6 miles into Middle Fork Cottonwood Creek (tributary through Cottonwood Creek to the Sacramento); fall, about 200 feet. Red Bluff sheet.

Alamo Creek (R); rises in Solano County, in the northern part of T. 6 N., R. 2 W.; flows southeastward about 22 miles into the head of Cache Slough (tributary through Steamboat Slough to the Sacramento); intermittent; tributary Ulatis Creek. Vacaville sheet.

Alder Creek (L); Eldorado County; rises in the northwestern part of T. 9 N., R. 16 E., on the north slope of Alder Hill, at altitude 6,900 feet above sea level; flows northwestward 11 miles into South Fork of American River (tributary through American River to the Sacramento); fall 3,400 feet. Pyramid Peak sheet.

Alder Creek (L); Sacramento County; rises in the central part of T. 9 N., R. 8 E., near White Rock, at altitude 450 feet above sea level; flows north of west 6 miles into American River (tributary to the Sacramento); fall about 350 feet. Sacramento sheet.

Alder Creek (R); Shasta County; rises in the eastern part of T. 34 N., R. 5 W., at altitude 1,400 feet above sea level; flows southeastward into Sacramento River; length, 1 mile; fall, 600 feet; intermittent. Redding sheet.

American Basin; east side Sacramento River, just above American River and along the east side of Feather River to Nicolaus; receives water which escapes through breaks in the south side Bear River levees and in the east side Feather River and Sacramento River levees below Bear River; also Sierra Nevada foothill drainage which reaches Sacramento Valley between Bear and American rivers. At flood stages this basin is the principal outflow point of American River waters. Its contents at flood height range from 15,000,000,000 to 25,000,000,000 cubic feet of water.

Sacramento River when in flood or at any stage at or above banks fills American Basin to the height of its own water at the mouth of American River. The filling begins by inflow of water through a number of sloughs-deep channels leading from the interior of the basin to Sacramento River just above American River. As soon as Sacramento River is bank-full it sends water across banks unobstructed near the mouth of American River and through breaks in its east side levees just below the mouth of Feather River into the basin until the whole surface of the water in the basin rises and falls with the rise and fall of the river.

Sacramento Valley map. Report of Examining Commission on Rivers and Harbors to the Governor of California (C. T. Reed, C. E. Grunsky, J. J. Crawford, commissioners), Sacramento, 1890, pp. 65–66

American Canyon Creek (L) rises in Eldorado County, in the northeastern part of T. 12 N., R. 9 E., at altitude 2,100 feet above sea level; flows northwestward into Middle Fork of American River (tributary through North Fork of American and American River to the Sacramento); length about 3 miles; fall 1,300 feet. Placerville sheet.

American River (L); formed by the union of North, Middle, and South forks; flows southwestward to junction with the Sacramento just above the city of Sacramento. The drainage area lies on the western slope of the Sierra Nevada south of Bear and Yuba River basins, west of Lake Tahoe and the Truckee River basin and north of the Cosumnes and Mokelumne River basins. The area is triangular in shape, about 80 miles long, has a maximum width of 50 miles along the crest of the Sierra, and comprises about 2,000 square miles.

The North and Middle forks unite near Auburn, about 20 miles above the mouth of the South Fork, which is only a few miles above Folsom. Each of the forks is about 60 miles long. The North Fork drains an area comprising 349 square miles; the Middle Fork 640 square miles, and the South Fork 861 square miles. Each of the forks has many other forks, branches, and tributaries.

Almost half of the American River basin exceeds 5,000 feet in altitude and probably one-third of it ranges from 6,000 to 9,000 feet. The lower elevations of the basins are barren or sparsely timbered; the higher areas support a good growth of timber. All the upper part of the basin, amounting to considerably more than half the area, is included in a Federal forest reserve.

Mean annual precipitation ranges from 21 inches in Sacramento Valley to approximately 60 inches near the summit of the Sierra Nevada, where it occurs as snow that does not disappear until summer. In the foothill region it ranges from 25 to 30 inches and in the central region from 45 to 55 inches.

American River, like the Yuba and the Bear, has received large quantities of débris from the hydraulic mines in the regions about its source and its bed is practically filled up with this material.

The river is torrential in character. Its summer flow is small but in winter and spring it sometimes rises very rapidly and to very high stages. Its flood stage is of short duration, rarely more than a day.

At Folsom, where the river leaves its granite canyon, it enters on a stretch in which it flows over and between cobble bars. Just below Folsom the hills on the south are farther back from the river and a high gravel bar rises from the waters edge. Near its mouth the river flows in a broad, shallow channel whose sandy bottom is 4 to 10 feet below the tops of the natural banks. At high stages the water spreads over the banks toward Sacramento River, connecting toward the north with the American Basin and toward the south standing against the Sacramento City levees and thus entering channel of Sacramento River close above Sacramento.

Storage on a large scale is not possible in the American River basin, although the Middle and South forks afford storage sites for power and mining. The minimum flow of the streams in the American River basin, with the existing fall, is sufficient to develop about 100,000 horsepower without storage, of which about 40 per cent is on the South Fork and only 30 per cent on the Middle Fork.

The upper part of the drainage area of American River shows features of glaciation in the many small lakes, some of which have been dammed and used for storage in connection with mining.

Gaging stations at Fairoaks (1904–1909), on the North Fork near Colfax (1911), and on the South Fork near Placerville (1911).

Surveys and data: Truckee, Pyramid Peak, Colfax, Placerville, and Sacramento sheets. Water-Supply Paper U. S. Geol. Survey No. 271, pp. 151–153. See also Pleasant Grove, Roseville, Arcade, Antelope, Folsom, Brighton, Mills, and American sheets.

American River, Middle Fork (L); rises in Placer County in the northeastern part of T. 15 N., R. 15 E., on the west slope of Needle Peak (altitude 8,920 feet) and Granite Chief, at an altitude exceeding 8,500 feet above sea level; takes a general southwesterly course to its junction with the North Fork of American River (tributary through American River to the Sacramento) near Auburn; length, about 60 miles;

drainage area, 640 square miles; fall, nearly 9,000 feet. The head-water streams interlock with streams flowing eastward to the Truckee, northward to the North Fork of the American, and southward to Rubicon River, one of the lower tributaries of the Middle Fork. Principal tributaries of this fork of the American are Rubicon and North Fork of Middle Fork of American rivers. Truckee, Colfax, Placerville, and Sacramento sheets.

American River, Middle Fork, North Fork of (R); rises in Placer County, in the northern part of T. 15 N., R. 13 E., at altitude 6,500 feet above sea level; takes an irregular but in general southwesterly course to its junction with Middle Fork of American River (tributary to North Fork of American to American River and thus to the Sacramento); length about 18 miles; fall about 5,000 feet; flows through a deep canyon. Colfax sheet.

American River, Middle Fork, South Fork of. See *Rubicon River.*

American River, North Fork (R); rises in Placer County, in the southern part of T. 16 N., R. 15 E., on the north slope of Needle Peak (altitude 8,920 feet); flows in general northwestward to Soda Springs, then southwestward to its junction with the South Fork near Folsom. The head of this fork of the American lies in a region of high peaks and the headwater rivulets interlock with streams flowing northward to the Yuba, eastward to Truckee River and Lake Tahoe, and southward to the Middle Fork of the American. The North Fork receives the Middle Fork near Auburn, and its drainage basin measured at its junction with the South Fork comprises nearly a thousand square miles. It is therefore entitled to rank as the master stream of the American system. Gaging station near Colfax, 1911. Truckee, Colfax, and Sacramento sheets.

American River, North Fork of North Fork (R); rises in Placer County, in the eastern part of T. 17 N., R. 12 E., at altitude 5,500 feet above sea level; flows southwestward to its junction with North Fork of American (tributary through American River to the Sacramento) in the northern part of T. 15 N., R. 11 E.; length, 12 miles; fall, 3,500 feet. Colfax sheet.

American River, North Fork of North Fork, East Fork of (L); rises in Placer County, in the eastern part of T. 16 N., R. 12 E., at altitude 6,500 feet above sea level; flows north of west 3 miles, then southwest 2½ miles to its junction with the North Fork of the North Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 2,800 feet; principal tributary, Monumental Creek. Colfax sheet.

American River, South Fork (L); rises in Eldorado County, in the eastern part of T. 11 N., R. 17 E., in Audrain Lake, at altitude 7,150 feet above sea level; flows westward to its junction with the North Fork of American River (tributary through American River to the Sacramento) near Folsom. The river is about 60 miles long and its drainage area comprises 861 square miles; fall, 7,000 feet; through the greater part of its course it flows in a deep canyon. Pyramid Peak, Placerville, and Sacramento sheets.

American River, South Fork, Silver Fork of (L); rises in Amador County, in the southern part of T. 10 N., R. 17 E., in Silver Lake, at altitude 7,150 feet; flows northwestward into South Fork of American River (tributary through American River to the Sacramento); length, 13 miles; fall, 3,150 feet; principal tributary, stream from Twin Lakes. Pyramid Peak sheet.

Angel Meadow Creek. See *Willow Creek*, tributary to McCloud River.

Angel Slough. Butte Basin, east of Sacramento River and west of Butte Creek, in Butte, Glenn, and Colusa counties; extends southward from Little Chico Creek to Butte Creek.

Antelope Creek (R); Placer County; rises in the southern part of T. 12 N., R. 7 E., at altitude 900 feet above sea level; flows southwestward 9 miles into Linda Creek (tributary to Bush Lake, American Basin); fall 650 feet; intermittent. Sacramento sheet.

Antelope Creek (L); Tehama County; rises near the center of T. 28 N., R. 3 E., at altitude 5,000 feet above sea level; flows very irregularly westward about 33 miles into the northern part of Rio de los Berrendos Rancho, where it emerges from the deep canyon through which its upper course lies, and then winds southward 10 miles, discharging its waters through New Creek to Salt Creek and thus to the Sacramento through Craig Creek, which enters the Sacramento opposite Blackberry Island, and through several unnamed channels; intermittent below canyon; fall from head to lowest mouth on Sacramento, about 4,800 feet; principal tributary, Little Antelope Creek; many small unnamed tributaries. Lassen Peak and Tehama sheets.

Antelope Creek, Little (L); rises in Tehama County, near the center of T. 27. N., R. 1 E., at altitude 2,200 feet above sea level; flows in general somewhat south of west to its junction with Antelope Creek (tributary to Sacramento River) 1 mile below Sycamore Lodge in Rio de los Berrendos; length, 16 miles; fall, 1,940 feet. Tehama sheet.

Antone Canyon Creek (R); rises in Placer County, in the western part of T. 15 N., R. 13 E., at altitude 6,200 feet above sea level; flows southwestward 3 miles into North Fork of Middle Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,700 feet. The canyon is called Antone Canyon for about 2 miles below the junction of the creek with the North Fork of the Middle Fork of American River. Colfax sheet.

Arcade Creek (L); rises in Sacramento County, in the northern part of Rancho de San Juan, at altitude 200 feet above sea level; takes a general southwesterly course about 30 miles, and discharges into the American Basin 3 miles north of the City of Sacramento; fall 180 feet; intermittent. Antelope, Arcade, and Fairoaks sheets.

Arkansas Ravine Creek (L); rises in Plumas County, in the southern part of T. 23 N., R. 7 E., at altitude 5,400 feet above sea level; flows northwestward into Coldwater Creek, tributary to Coquette Creek, which flows through Little North Fork Feather River to Middle Fork Feather, and thus through Feather River to the Sacramento; length, 1 mile; fall, 550 feet. Bidwell Bar sheet.

Ash Creek (L); Lassen County; rises in the north-central part of T. 36 N., R. 11 E., at altitude (approximate) 6,000 feet above sea level; flows northwesterly, and unites with Pit River (which flows into the Sacramento) about 4 miles north of Bieber; length, about 40 miles; fall, 1,900 feet; principal tributaries, Cottonwood and Willow creeks; gaging station at Adin, 1904–5. Modoc Lava Bed and Alturas sheets.

Ash Creek (L); Shasta County; rises in the eastern part of T. 30 N., R. 3 W.; flows westward 4 miles into Sacramento River; fall, about 300 feet. Red Bluff sheet.

Ash Creek (R); Siskiyou County; rises in the northeastern part of T. 41 N., R. 3 W., on the eastern slope of Mount Shasta, at altitude (approximate) 8,000 feet above sea level; flows eastward and then southward; carries water in lower course only in times of flood; ordinarily the water sinks into the porous lavas and percolates southward, finally emerging as springs which discharge into McCloud River (tributary to Pit River and thus to the Sacramento). Shasta and Modoc Lava Bed sheets.

Auburn Ravine Creek (L); rises in Placer County, in the northern part of T. 12 N., R. 8 E., 1 mile north of Auburn, at altitude 1,500 feet above sea level; takes a very irregular but in general southwesterly course to American Basin which it enters through Bunkham Slough; about 35 miles long; intermittent, carrying no water below the foothills except in time of flood; fall in the 10 miles of its course that lies within the foothills, about 1,100 feet; tributaries Dutch Ravine, Orchard and Rock creeks. Sacramento sheet; also Lincoln, Roseville, and Pleasant Grove sheets.

Audrain Lake; Eldorado County, T. 11 N., on the line between Rs. 17 and 18 E., outlet South Fork of American River (tributary through American River to the Sacramento); elevation, 7,150 feet. Pyramid Peak sheet.

Avalanche Ravine Creek (L); rises in Sierra County, in the northern part of T. 19 N., R. 12 E., on the east slope of Keystone Mountain, at altitude 6,700 feet above

sea level; flows northwestward 2 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba River and Yuba River to Feather River and thus to the Sacramento); fall, 2,500 feet. Downieville sheet.

Axford Creek (L); rises in Plumas County, in the southwestern part of T. 23 N., R. 7 E., on the south slope of Grizzly Hill, at altitude 5,900 feet above sea level; flows southwestward into Little North Fork of Feather River (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); length, 2 miles; fall, 1,400 feet. Bidwell Bar sheet.

Babel Slough; Yolo Basin, extending from Sacramento River southwestward toward the head of Winchester Lake. Sheet M, Sacramento Valley map.

Backbone Creek (R); rises in Shasta County, near the center of T. 35 N., R. 6 W., on the eastern slope of Trinity Mountains, at altitude 4,200 feet above sea level; flows southeastward into Sacramento River at Kennett; length, about 14 miles; fall, 3,500 feet, of which 2,000 feet occurs in 5 miles at the head of the stream. Red Bluff and Redding sheets.

Backbone Creek, Little (R); rises in Shasta County, in the southwestern part of T. 34 N., R. 5 W., on the south slope of Bohemotash Mountain, at altitude 4,000 feet above sea level; flows southeastward 4 miles into Sacramento River at Kennett; fall, 3,250 feet, of which 2,500 feet occurs in about 2 miles at head. Redding sheet.

Backbone Creek, North Fork (L); rises in Shasta County, in the eastern part of T. 35 N., R. 6 W., at altitude 2,250 feet above sea level; flows southeastward about 4 miles into Backbone Creek (tributary to Sacramento River); fall, 900 feet. Redding sheet.

Bailey Creek (L); rises in Shasta County, in the southern part of T. 31 N., R. 3 E., at altitude 4,800 feet above sea level; flows southwestward 11 miles to junction with Rock Creek (tributary to North Fork of Battle Creek and thus through Battle Creek to the Sacramento); fall, 2,400 feet. Lassen Peak sheet.

Bailey Creek (R); rises in Shasta County, in the central part of T. 34 N., R. 4 W., on the eastern slope of O'Brien Mountain, at altitude 1,500 feet above sea level; flows eastward 2 miles into McCloud River (tributary to Pit River and thus to the Sacramento) 1 mile north of Baird; fall, 750 feet. Redding sheet.

Barker Creek (R); rises in Placer County, in the northeastern part of T. 14 N., R. 16 E., on the south slope of Barker Peak, at altitude 8,000 feet above sea level; flows southward 1½ miles, then northwestward 3½ miles into Rubicon River (tributary to Middle Fork of American River and thus through North Fork of American River and American River to the Sacramento); fall 2,600 feet; tributary, West Meadow Creek. Truckee sheet.

Basin Hollow Creek (R); rises in Shasta County, in the southwestern part of T. 32 N., R. 2 W., at altitude 900 feet above sea level; flows southwestward about 5 miles into Cow Creek (tributary to Sacramento River); fall, 350 feet; intermittent. Redding sheet.

Bartlett Creek (R); a creek to which no name is attached on Punnett's map rises in the northeastern part of T. 15 N., R. 8 W., flows generally eastward about 3½ miles to Bartlett Springs, then southeastward to the North Fork of Cache Creek (tributary through Cache Creek to Yolo Basin) 3 miles below Bartlett Springs. The name Bartlett Creek is applied on this map to a stream called on the Land Office and post route maps the North Fork of Cache Creek. Chandler[1] applies the name Bartlett Creek to the stream flowing through Bartlett Springs.

Battle Creek (L); formed in Shasta County, in the southeastern part of T. 30 N., R. 1 W., by union of North and South forks. The North Fork, which may be considered the continuation of the main stream, rises on the east slope of Latur Butte, in

[1] Chandler, A. E., Water storage on Cache Creek, California: Water-Supply Paper U. S. Geol. Survey No. 45, 1901, p. 27.

T. 32 N., R. 3 E., at altitude 5,000 feet above sea level, and flows southwestward to its junction with the South Fork (q. v.); below the forks Battle Creek flows westward, its channel joining that of the Sacramento opposite Bloody Island; total length, about 35 miles; fall from head of North Fork to the Sacramento, 4,600 feet, of which 2,000 feet occurs in the 8 miles above the mouth of North Fork. Lassen Peak and Red Bluff sheets.

Battle Creek, South Fork (L); rises in Tehama County, in the southern part of T. 30 N., R. 4 E., at altitude 6,000 feet above sea level; flows southward 4 miles into Battle Creek Meadows, then somewhat north of west 22 miles; unites with the North Fork to form Battle Creek, which is tributary to the Sacramento; fall above Battle Creek Meadows, 1,200 feet; fall above junction with North Fork, 5,000 feet; most of course lies in deep canyon. Lassen Peak sheet.

Bear Creek (L); Colusa County; rises in the east-central part of T. 16 N., R. 6 W.; flows southward 24 miles to its junction with Cache Creek (tributary to Yolo Basin) in the southern part of T. 13 N., R. 4 W.; other than the North Fork, Bear Creek is the only important tributary to Cache Creek. Twelve miles up Bear Creek is Bear Valley, 10 miles long and 2 miles in average width. Below the valley there is little open country and for the last 5 miles the creek traverses a narrow canyon. Two miles below Bear Valley Sulphur Creek empties into Bear Creek. Sulphur Creek drains a district in which large quicksilver mines are operated and many silver and mineral springs exist in its own bed. By the time it reaches Bear Creek its water contains so much mineral matter that it renders the water of the larger creek brackish and salty, unfitting it for irrigation. Bear Creek is said rarely to become dry.

Punnett's map of Colusa and Yolo Counties. Water-Supply Paper U. S. Geol. Survey No. 45, 1901, p. 27.

Bear Creek (R); Eldorado County; rises in the northwestern part of T. 12 N., R. 11 E., at altitude 3,200 feet above sea level; flows southwestward into the West Fork of Rock Creek (tributary through Rock Creek to South Fork of American River and thus through American River to the Sacramento); length 2 miles; fall 600 feet. Placerville sheet.

Bear Creek (R); Plumas County; rises in the northeastern part of T. 23 N., R. 8 E., at altitude 5,500 feet above sea level; flows very irregularly southwestward 4 miles, then southeastward 4 miles into Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,600 feet. Bidwell Bar sheet.

Bear Creek (L); Shasta County; rises in the southern part of T. 32 N., R. 2 E., at altitude 4,400 feet above sea level; flows southwestward (by general course) to junction with Sacramento River at Logans Ferry; length, about 35 miles; fall, 4,000 feet, of which 2,400 feet occurs in the first 15 miles of course. Lassen Peak and Red Bluff sheets.

Bear Creek (R); Sierra County; rises in the southern part of T. 19 N., R. 11 E., at altitude 5,900 feet above sea level; flows southwestward into Middle Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); length 4 miles; fall 2,500 feet. Colfax sheet.

Bear Creek (R); Siskiyou County, southeastern part; rises near the center of T. 40 N., R. 2 E., on the southern slope of Bear Mountain, at altitude (approximate) 4,700 feet above sea level; flows in a general southeasterly course about 16 miles and unites with Fall River (tributary to Pit River and thus to the Sacramento) near its head; fall, about 1,200 feet; intermittent in upper part of course. Modoc Lava Bed sheet.

Bear Creek, Little (L); Placer County; rises in the southeastern part of T. 16 N., R. 10 E., at altitude 4,500 feet above sea level; flows southwestward about 4 miles into Bear River (tributary through Feather River to the Sacramento) 1 mile north of Dutch Flat; fall 1,600 feet. Colfax sheet.

Bear Creek, Little (R); Plumas County; rises in the southwestern part of T. 23 N., R. 8 E., on the eastern slope of Mount Ararat, at altitude 5,500 feet above sea level;

flows southeastward 3 miles into Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,900 feet. Bidwell Bar sheet.

Bear Gulch Creek (R); rises in Shasta County, in the western part of T. 34 N., R. 1 W., at altitude 2,200 feet; flows southeastward 2 miles into Cedar Creek (tributary to Little Cow Creek, which flows into Cow Creek, which discharges to the Sacramento); fall, about 900 feet. Redding sheet.

Bear Lakes; Plumas County, northwestern part of T. 21 N., R. 12 E.; a group of eight connected lakes, all small, discharging by a stream 2 miles long, flowing northward to Gray Eagle Creek (tributary to Middle Fork of Feather River and thence through Feather River to the Sacramento). The highest of these lakes is about 6,700 feet above sea level; the lowest of the chain is at altitude 6,450 feet; the fall of the outlet stream to its junction with Gray Eagle Creek is about 300 feet. Downieville sheet.

Bear River (L); rises in Nevada County on the western slope of the Sierra Nevada in the central part of T. 17 N., R. 12 E., near Emigrant Gap, at altitude 5,500 feet above sea level; flows southwestward to its junction with Feather River (tributary to the Sacramento) about 15 miles south of Marysville; it forms a boundary line between Nevada and Placer counties and closely parallels the Bear-American divide, which is 1 to 2 miles south of it. Its principal tributaries are Steep Hollow Creek, Greenhorn Creek and Wolf Creek, all from the north.

The basin is about 60 miles long and not more than 10 miles wide and comprises a total area of less than 300 square miles. The mean annual precipitation ranges from 21 inches in the valley to 52 inches at the source of the river where much of it falls as snow that soon disappears.

The area drained by the Bear has been extensively mined and its bottom lands have been covered with silt and sand to so great a depth that in places levees have been built on the old upland to prevent its inundation. The mouth of the Bear has been almost obliterated by the débris brought down from the mines; from the Feather River side it can scarcely be found. The river water, after passing through the narrow channel near the lower bridges, spreads out over a great expanse of brush-covered Feather River bench lands. Colfax, Smartsville, and Sacramento sheets.

Beatson Hollow Creek (L); rises in Butte County in the northwestern part of T. 20 N., R. 4 E., on the west slope of Table Mountain, at altitude 1,100 feet above sea level; flows southwestward 5 miles into Coal Canyon Creek (tributary through Chambers Ravine Creek to Dry Creek and thus to Butte Basin); fall about 800 feet. Chico sheet.

Beaver Creek (L); Lassen County; rises in the northwestern part of T. 34 N., R. 7 E., on the northwestern slope of Black Butte, 5,400 feet above sea level; flows in general northwesterly to its junction with Pit River (tributary to Sacramento River) a mile west of Pittville; length, 18 miles; fall, about 2,000 feet, of which 1,800 feet occurs in the first 8 miles of course. Lassen Peak and Modoc Lava Bed sheets.

Beaver Creek (R); Yuba County; rises in the central part of T. 19 N., R. 8 E., at altitude 3,000 feet above sea level; flows southward 2 miles into Willow Creek (tributary through North Fork of Yuba River to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 800 feet. Smartsville sheet.

Beaver Lake; Colusa Basin, west side of Sacramento River, in Jimeno Rancho just north of the westward bend in the river. Sheet G, Sacramento Valley map.

Bee Creek (R); rises in Shasta County, in T. 30 N., R 7 W., at altitude 700 feet above sea level; flows north of east 2 miles into North Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River) 1½ miles south of Ono; fall, about 25 feet (?). Red Bluff sheet.

Beegum Creek (R); rises in Tehama County, in the northeastern part of T. 27 N., R. 10 W., on the north slope of North Yolla Bolly Mountain, 6,000 feet above sea level; flows northeastward along the west base of Beegum Peak, and unites with Middle Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River); length, 16 miles; fall, 4,200 feet. Red Bluff sheet.

Berry Creek (L); rises in Butte County, in the western part of T. 21 N., R. 6 E., on the south slope of Bald Rock, at altitude 3,000 feet above sea level; flows westward 3 miles, then northwestward 3 miles to junction with North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,400 feet. Bidwell Bar sheet.

Bidwell Creek (R); rises in Butte County, in the southern part of T. 22 N., R. 5 E., at altitude 2,900 feet above sea level; flows southeastward 2 miles into French Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 1,000 feet. Bidwell Bar sheet.

Big Butte Creek. See *Butte Creek.*

Big Canyon Creek. See *Canyon Creek, Big.*

Big Chico Creek. See *Chico Creek, Big.*

Big Grizzly Creek. See *Grizzly Creek.*

Big Iowa Canyon Creek. See *Iowa Canyon Creek.*

Big Lake; a permanent water body on the east edge of the tidal marsh near the lower end of Yolo Basin, west of Elkhorn Slough and Merritt Island. Sheet M, Sacramento Valley map.

Bird Creek (R); Plumas County; rises in the southeastern part of T. 23 N., R. 9 E., at altitude 6,100 feet above sea level; flows west of south into Onion Valley Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); 1 mile long; fall, 600 feet. Downieville sheet.

Bird Creek (R); Yolo County; rises in the central part of T. 12 N., R. 2 W.; flows southeastward into T. 12 N., R. 1 W., then northeastward into Colusa Basin. Sheet F, Sacramento Valley map.

Black Canyon Creek (R); rises in Placer County, in the northeastern part of T. 15 N., R. 12 E., at altitude 6,000 feet above sea level; flows southward into Secret Canyon Creek (tributary to North Fork of Middle Fork of American River and thus to North Fork of American River, which flows through the American to the Sacramento); length, 2 miles; fall, 1,400 feet. Colfax sheet.

Black Hawk Creek (L); rises in Plumas County, in the northern part of T. 24 N., R. 9 E., at altitude 4,200 feet above sea level; flows northeastward about 3 miles into Spanish Creek (tributary to Indian Creek, and thence through North Fork of Feather River to Feather River and the Sacramento); total fall 1,000 feet. Downieville sheet.

Bloody Run (L); rises in Nevada County, in the east-central part of T. 18 N., R. 10 E., at altitude 5,000 feet above sea level; flows westward 4 miles, then northward 1 mile into Middle Fork Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); fall, 2,600 feet, of which 1,600 feet occurs in the last mile and a half. Colfax sheet.

Blue Canyon Creek (R); rises in Placer County, in the northwestern part of T. 16 N., R. 11 E., at altitude 5,300 feet above sea level; flows southwestward 7 miles into North Fork of North Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); fall 3,100 feet. Colfax sheet.

Blue Lake; northeastern part of Lassen County, in western part of T. 38 N., R. 15 E.; inlets, two small unnamed streams; outlet, a stream about 5 miles long flowing circuitously westward into Clark Creek (West Valley canyon), which is tributary through South Fork of Pit River to Pit River and thus to the Sacramento; elevation, about 6,500 feet. Alturas sheet.

Blue Lake; Nevada County, northern part of T. 17 N., R. 12 E.; no outflowing stream mapped, but the lake lies in an area draining southward to South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); elevation 6,000 feet above sea level. Colfax sheet.

Blue Tent Creek (R); rises in Tehama County, near the center of T. 28 N., R. 4 W., about 500 feet above sea level; flows southeastward into Sacramento River 2 miles above Red Bluff; about 8 miles long; fall, 200 feet. Tehama sheet.

Bollibokka Creek (L); rises in Shasta County, in the southern part of T. 36 N., R. 3 W., on the west slope of Bollibokka Mountain, at altitude 3,000 feet above sea level; flows northwestward 2 miles into McCloud River (tributary through Pit River to the Sacramento); fall, 1,800 feet. Redding sheet.

Boomer Creek (R); rises in Butte County, near the center of T. 21 N., R. 7 E., at altitude 4,700 feet above sea level; flows southwestward into Fall River (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); 2½ miles long; fall, 1,200 feet. Bidwell Bar sheet.

Boulder Creek (R); Shasta County; rises in the southwestern part of T. 32 N., R. 6 W., on the southeast slope of Bally Mountain, at altitude 2,300 feet above sea level; flows eastward 2 miles into Clear Creek (tributary to Sacramento River); fall, about 1,300 feet. Red Bluff sheet.

Boulder Creek (R); Shasta County; rises in the eastern part of T. 32 N., R. 5 W., southeast of Quartz Hill, at altitude 700 feet above sea level; flows southeastward 3 miles into Churn Creek (tributary to Sacramento River); fall, 125 feet; intermittent. Redding sheet.

Boulder Creek (R); Shasta County; rises near the center of T. 32 N., R. 7 W., on the east slope of Bally Mountain, at altitude 2,600 feet; flows northeastward 2 miles into Clear Creek (tributary to Sacramento River); fall, 1,500 feet. Red Bluff sheet.

Bounde Creek (L); Glenn County, Larkin Children's ranch; an intermittent creek in the Colusa Basin, discharging southward to Willows Creek (to Colusa Basin) about 2 miles west of Princeton. Sheet C, Sacramento Valley map.

Bowman Lake; Nevada County, northern part of T. 18 N., R. 12 E., inlet Canyon Creek from French and Faucherie lakes; outlet Canyon Creek, which leaves the lake through two channels, both of which are dammed, to South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation 5,300 feet. In the 8 miles below Bowman Lake Canyon Creek falls 2,600 feet; the lake is nearly 2 miles long, half a mile wide, and contains several small islands. Colfax sheet.

Brandy Creek (R); rises in Shasta County, in the southern part of T. 32 N., R. 7 W., on the southeast slope of Bally Mountain, at altitude 2,700 feet above sea level; flows northeastward into Clear Creek (tributary to Sacramento River) at Stella; length, 3 miles; fall, 1,600 feet. Red Bluff sheet.

Breakneck Canyon Creek (L); rises in Butte County in eastern part of T. 24 N., R. 4 E., at altitude 5,300 feet above sea level; flows southwestward 4 miles into West Branch of Feather River (tributary through North Fork of Feather River to Feather River and thence to the Sacramento); fall 2,400 feet. Bidwell Bar and Chico sheets.

Brewer Creek; rises in Siskiyou County, on northeastern slope of Mount Shasta, at altitude 8,000 feet above sea level; flows northeastward about 5 miles; its waters then sink into the lava beds and join the underground drainage tributary through springs to McCloud River (tributary to Pit River and thus to the Sacramento). Shasta sheet.

Brimstone Creek (L); rises in Placer County, in the southern part of T. 15 N., R. 11 E., at altitude 4,000 feet above sea level; flows irregularly southwestward about 6 miles into Shirttail Canyon Creek (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,600 feet. Colfax sheet.

Briscoe Creek (L); rises in Glenn County, in the eastern part of T. 19 N., R. 8 W.; flows southward about 5 miles, then takes a general northeasterly course about 11 miles to junction with Stony Creek (tributary to Sacramento River); drains a mountainous area of which Sheetiron Mountain forms the summit. The creek intersects a conglomerate bed in a narrow gorge that is in places only 3 feet wide. Punnett's map of Glenn and Colusa counties. See also Water-Supply Paper U. S. Geol. Survey No. 86, pp. 34–47.

Britona Creek (R); rises in Yolo County in T. 11 N., R. 1 W., at altitude 250 feet above sea level; flows east of north 4 miles, then eastward 1 mile; intermittent; water sinks before reaching Colusa Basin. Dunnigan sheet.

Brock Creek (R); rises in Shasta County, in the northwestern part of T. 35 N., R. 2 W., on the south slope of Brock Butte, at altitude 2,500 feet above sea level; flows south 4½ miles into Pit River (tributary to Sacramento River); fall, 1,500 feet; intermittent in upper course. Redding sheet.

Brush Creek (R); Colusa County; rises in the southeastern part of T. 13 N., R. 3 W.; flows northeastward into Colusa Basin; intermittent. Sheet F, Sacramento Valley map.

Brush Creek (R); Eldorado County; rises in the eastern part of T. 12 N., R. 12 E., on the north slope of Saddle Mountain, at altitude 4,500 feet above sea level; flows southwestward 6 miles into South Fork American River (tributary through American River to the Sacramento); fall, 2,700 feet. Placerville sheet.

Brush Creek (L); Nevada County; rises in the southeastern part of T. 17 N., R. 8 E., at altitude 2,600 feet above sea level; flows northwestward 1½ miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 1,200 feet. Smartsville sheet.

Brush Creek (R); Tehama County; rises near the center of T. 25 N., R. 1 E., at altitude about 1,500 feet above sea level; flows southwestward 6 miles, then southward 3 miles into Singer Creek (tributary through Pine Creek to the Sacramento); fall, about 1,200 feet, of which 1,000 feet occurs in the first 4 miles. Chico sheet.

Brushy Creek (L); Placer County; rises in the northeastern part of T. 13 N., R. 12 E., at altitude 4,600 feet above sea level; flows southwestward 1½ miles, then northwestward 3½ miles into Middle Fork of American River (tributary to North Fork of American River and thus through American River to the Sacramento); fall, 2,500 feet, of which 1,400 feet occurs in 2 miles at mouth. Colfax sheet.

Brushy Creek (L); rises in Placer County, in the eastern part of T. 14 N., R. 10 E., at altitude 3,200 feet above sea level; flows westward 3 miles into Shirttail Canyon Creek (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,400 feet. Colfax sheet.

Buckeye Creek (R); rises in Shasta County, in the northeastern part of T. 32 N., R. 5 W., on Quartz Hill, at altitude 1,100 feet above sea level; flows southeastward 2½ miles into Churn Creek (tributary to Sacramento River); fall, 350 feet, 200 feet being in first half mile of course; intermittent. Redding sheet.

Buckeye Creek (R); rises in Yolo County in the eastern part of T. 12 N., R. 3 W.; flows northeastward into Colusa Basin; intermittent. Sheet F, Sacramento Valley map.

Buck Island Lake; Eldorado County, northwestern part of T. 13 N., R. 16 E., inlet from Rock Bound Lake; outlet a stream 1½ miles long flowing west of north into Rubicon River (tributary through Middle Fork of American River to North Fork of American River and thus through the American to the Sacramento); elevation, 6,400 feet above sea level; fall of outlet, 450 feet; connected with Rock Bound Lake by a stream one-fourth mile long which falls 150 feet. Truckee and Pyramid Peak sheets.

Bucks Creek (L); rises in Plumas County, on the southwestern part of T. 24 N., R. 8 E., at altitude 6,500 feet above sea level; takes general westerly course to its junction with the North Fork of Feather River; length, about 12 miles; fall, 4,800 feet. Bidwell Bar sheet.

Bull Run Creek (R); rises in Plumas County, in the northern part of T. 23 N., R. 12 E., at altitude 6,700 feet above sea level; flows southward 2 miles into Long Valley Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); fall, 1,500 feet. Downieville sheet.

Bunch Canyon Creek (R); rises in Placer County, in the northern part of T. 14 N., R. 9 E., near Colfax, at altitude 2,400 feet above sea level; flows southeastward into North Fork of American River (tributary through American River to the Sacramento); length, 6 miles; fall, 1,900 feet, of which 1,500 feet occurs in one-half mile in a stretch about 2 miles above the mouth of the creek. Colfax sheet.

Bunkham Slough; Sutter Basin, Sutter County, south of Coon Creek and north of Markham Ravine Creek. Sheridan, Nicolaus, and Vernon sheets.

Burnett's Canyon Creek (L); rises in Placer County, in the southwestern part of T. 16 N., R. 12 E., at altitude 5,300 feet above sea level; flows somewhat north of west to its junction with the North Fork of North Fork of American River (tributary through North Fork of American River to American and thus to the Sacramento); length, 4 miles; fall, 1,700 feet. Colfax sheet.

Burney Creek (L); rises in Shasta County, in the southern part of T. 33 N., R. 3 E., on the south slope of Burney Butte, at altitude 4,800 feet; flows in general somewhat east of north to junction with Pit River (through which it is tributary to Sacramento River) near Pecks, in southwestern part of T. 37 N., R. 3 E.; length, about 24 miles; fall, 2,100 feet; minimum flow several hundred second-feet; estimated horsepower available, 10,000. Lassen Peak and Modoc Lava Bed sheets.

Burton Gulch Creek (R); rises in Plumas County, in the northwestern part of T. 24 N., R. 8 E., at altitude 5,500 feet above sea level; flows southeastward 2 miles into Spanish Creek (tributary to Indian Creek and thence through North Fork of Feather River to Feather River into the Sacramento); fall, 1,500 feet. Bidwell Bar sheet.

Bush Lake; south end of American Basin, just north of junction of American River with the Sacramento; a more or less permanent body of water occupies the lower end of American Basin. It is fed by overflow from the north banks of Sacramento and American rivers and by the general southward drainage of the basin. A long, narrow sloughlike arm extending northward from near its westward end is called Fishermens Lake. Fairoaks and Davisville sheets.

Bushy Lake; Sacramento County, Rancho del Paso, one-half mile north of American River, 1 mile north of east of Sacramento. Brighton sheet.

Butcher Ranch Creek (L); rises in Sierra County, in the northwestern part of T. 20 N., R. 12 E., at altitude 5,500 feet above sea level; flows westward 3 miles into East Fork of North Fork of Yuba River (tributary to North Fork of North Fork of Yuba, Downieville branch, which flows through North Fork of Yuba to Middle Fork of Yuba, and thus through Yuba River to Feather River and the Sacramento); fall, 1,800 feet. Downieville sheet.

Butt Creek (R); rises in Plumas County, the western part of T. 27 N., R. 5 E., at altitude 5,800 feet above sea level; flows eastward about 14 miles, then southeastward through Butte Valley 10 miles to junction with North Fork of Feather River (tributary through Feather River to the Sacramento) 8 miles south of Prattville; total fall, 2,900 feet. Gaging station near Butte Valley 1905–1909. Lassen Peak sheet.

Butte Basin; east side of Sacramento River, northwest and west of Marysville Buttes; receives the water of Butte and Battle Mountain creeks and the east side overflow from Sacramento River, particularly the overflow which reaches the Angel Slough country, and in times of great flood some of the waters of Feather River which flow westward past the northern slope of the buttes.

Butte Basin is a very broad, flat-bottomed depression in which water flows from north to south. The basin discharges into Sutter Basin. Under ordinary circumstances no water from it directly reenters Sacramento River. During a general flood stage of the river the basin holds a slowly moving sheet of water from 30 to nearly 150 square miles in area, according to the amount of inflow into the basin. When the outflow of the basin is checked at the lower end by a river stage above banks, its contents range between 5,000,000,000 and 20,000,000,000 cubic feet of water.

Chico Creek flood waters are poured into the basin from the north, which is, in short, an important supplementary drainway.

Sacramento Valley map. Report of Examining Commission on Rivers and Harbors to the Governor of California (C. T. Reed, C. E. Grunsky, J. J. Crawford, commissioners), Sacramento, 1890, p. 62.

Butte Creek (L); formed in the northern part of Butte County, in the southeastern part of T. 24 N., R. 3 E., by the union of East and West forks, of which the East Fork drains the larger area and may therefore be considered the head of the main stream. The East Fork rises in the northeastern part of Butte County in the southeastern part of T. 26 N., R. 5 E., at altitude 5,800 feet above sea level, flows northwestward for 5 miles and then takes a general southwesterly course to the lower end of Butte Basin, east of Sacramento River, where it discharges into Butte Sink; length from Butte Sink to head of East Fork about 80 miles; fall in 40 miles between the head and the point where it leaves the foothills 5,300 feet. The valley is long and very narrow. The principal tributaries are West Fork, Little Butte and Dry creeks. Lassen Peak, Chico, and Marysville sheets.

Butte Creek, Little (L); rises in Butte County, in the eastern part of T. 24 N., R. 3 E., near Powellton, at altitude 3,600 feet above sea level; takes a general southwesterly course to its junction with Big Butte Creek; length, about 18 miles; fall, 3,200 feet; principal tributaries Mosquito and Middle Butte creeks. Chico sheet.

Butte Creek, Middle (R); rises in Butte County, in the eastern part of T. 23 N., R. 3 E., at altitude 2,700 feet above sea level; flows west of south about 6 miles to its junction with Little Butte Creek (tributary through Butte Creek to Butte Basin); fall, 1,700 feet. Chico sheet.

Butte Creek, West Fork (R); rises in Butte County, in the northeastern part of T. 25 N., R. 3 E., near Lomo, at altitude 3,800 feet above sea level; flows southward to junction with the East Fork of Butte Creek (tributary through Butte Creek to Butte Basin); length, 9 miles; fall, above forks, about 1,800 feet. Lassen Peak and Chico sheets.

Butte Slough; between Sutter and Butte basins, east side Sacramento River, southwest of Marysville Buttes. Through this slough Butte Basin drains to Sutter Basin. Under ordinary circumstances no water passes through Butte Slough to Sacramento River. Such discharge would occur only at times when the river falls more rapidly than the water in Butte Basin, at less than bank heights inflow would begin through Butte Slough, which is connected with Butte Basin by circuitous route through Butte Sink. Marysville sheet.

Byers Slough; Colusa Basin, west side Sacramento River, extending southwestward from a point 1 mile south of Grand Island. Sheet E, Sacramento Valley map.

Byron Creek (L); rises in Shasta County, in T. 30 N., R. 7 W., at altitude 1,800 feet above sea level; flows southeastward about 2 miles into North Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River) near Ono; fall, 1,000 feet. Red Bluff sheet.

Cabin Hollow Creek (R); rises in Butte County, 2 miles west of the head of Sycamore Creek, at altitude 1,300 feet above sea level; flows southwestward 3 miles, then southward 1½ miles into Sycamore Creek (tributary to Mud Creek and thus through Big Chico Creek to the Sacramento); fall, 1,000 feet. Chico sheet.

Cache Creek (R); rises in Lake County, in Clear Lake, of which it is the only known outlet; flows southeastward to Yolo Basin; length about 80 miles; drainage area 1,290 square miles.

The basin lies on the eastern slope of the Coast Range in Lake, Colusa, and Yolo counties, immediately south and west of the south end of the Stony Creek basin and north of Putah Creek; the principal part of the area, comprising about 824 square miles, lies in central Lake County, south of the divide between Cache Creek basin and the basin of Eel River. This tract is roughly rectangular in shape and contains Clear Lake in its center. The lower part of the basin extends southeastward from Lake County to the Sacramento Valley, as a stretch about 50 miles long and 10 miles wide.

The largest and most important tributary of Cache Creek is its North Fork, which drains 250 square miles in the eastern part of Lake County. The only other important

tributary is Bear Creek, which drains the western part of Colusa County. These creeks closely resemble each other and in summer rarely become dry. All the tributaries are torrential.

The upper part of the basin is mountainous and very rugged, some of the peaks reaching an altitude 6,000 feet above sea level, and other slopes as well as those of the lower ranges are very steep. About 5 miles below Clear Lake the creek enters its canyon into which it flows for 25 miles on an average grade of 30 feet to the mile. In some places the canyon walls are vertical cliffs 300 feet high. Below the canyon the creek enters Capay Valley, from 1 to 2 miles wide and 20 miles long, through which it winds for nearly 30 miles before it enters Sacramento Valley.

On the northern slopes of the mountains around Clear Lake are belts of fir, oak, and pine; elsewhere on the high ranges the vegetation consists of a dense growth of greasewood and chaparral. A stretch along the northern edge of the basin is included in a national forest.

Good storage sites are available in this basin. Clear Lake forms a natural reservoir which is very effective in regulating the flow of Cache Creek.

The creek furnishes exceptional opportunities for irrigation development and opportunities for water power development are also excellent. The upper part of the basin contains springs, a number of which have medicinal properties.

Gaging stations at Lower Lake (1901–1910) and at Yolo (1903–1910).

Surveys and data: Punnett's map of Mendocino and Lake counties, 1908; Sacramento Valley map; Water-Supply Paper U. S. Geol. Survey No. 45, 1901.

Cache Creek, Middle. See *Middle Creek.*

Cache Creek, North Fork (L); rises in Lake County, in the eastern part of T. 16 N., R. 9 W.; takes a general southeasterly course to its junction with Cache Creek (tributary to Yolo Basin) in the northeastern part of T. 13 N., R. 6 W. This branch, often called Cache Creek, drains the country to the north and east of Clear Lake and adds very materially to the drainage area of the creek but is much smaller than the stream from the lake; length, above junction with Cache Creek, 35 miles.

Land Office map of California, 1907; post route map of California. See also Water-Supply Paper U. S. Geol. Survey No. 45, pp. 27 to 28. On Punnett's map of Lake and Mendocino counties the stream called North Fork on the Land Office and post route maps is called Bartlett Creek.

Cache Creek Slough; Colusa Basin, Yolo County, extends southwestward from a point near the Sacramento at Sycamore Slough north to Cache Creek at Yolo. Sheet H, Sacramento Valley map.

Cache Slough; the outlet channel through which the waters of Yolo Basin enter Steamboat Slough on Sacramento River; tidal. Sheet P, Sacramento Valley map.

Camel Creek (L); rises in Tehama County, in the northwestern part of T. 24 N., R. 2 E., on the east slope of Camel Mound, at altitude 2,500 feet above sea level; flows southwestward into Pine Creek (tributary to the Sacramento); length, about 12 miles; fall, 2,200 feet. Chico sheet.

Camp Creek (R); Butte County; rises in the southern part of T. 24 N., R. 5 E., at altitude 4,500 feet above sea level; flows somewhat east of south 6 miles to junction with North Fork Feather River (tributary through Feather River to the Sacramento); fall, 3,000 feet. Bidwell Bar sheet.

Camp Creek (L); Plumas County; rises in the western part of T. 23 N., R. 11 E., at altitude 6,800 feet above sea level; flows northeastward into Poplar Creek (tributary through Middle Fork of Feather River to Feather River and the Sacramento); length, 2 miles; fall, 2,300 feet. Downieville sheet.

Campbell Creek (R); Butte County; rises in the southern part of T. 25 N., R. 3 E., at altitude 3,200 feet above sea level; flows southward 2 miles into West Fork of Butte Creek (tributary through Butte Creek to Butte Basin); fall, 500 feet. Chico sheet.

Campbell Creek (L); Shasta County; rises in the southern part of T. 35 N., R. 3 W., on the western slope of Minnesota Mountain, at altitude 4,000 feet above sea level; flows northwestward about 4 miles into McCloud River (tributary through Pitt River to the Sacramento); fall, 3,100 feet. Redding sheet.

Canyon Creek (R); Butte County; rises in the northern part of T. 20 N., R. 5 E., at altitude 2,400 feet above sea level; flows irregularly southwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento (1 mile below Bidwell Bar; length, 6 miles; fall, 2,100 feet. Bidwell Bar sheet.

Canyon Creek (L); Eldorado County; rises in the southwestern part of T. 13 N., R. 11 E., at altitude 3,300 feet above sea level; flows in general somewhat north of west into Middle Fork of American River (tributary through North Fork of American River and American River to the Sacramento); length, about 9 miles; fall, 2,500 feet, of which about 1,000 feet occurs in 2 miles just above mouth. Placerville sheet.

Canyon Creek (L); Nevada County; rises in the western part of T. 18 N., R. 13 E., in French Lake, at altitude 6,550 feet above sea level; flows northwestward 5 miles to Bowman Lake, thence southwestward 10 miles to its junction with the South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); flows through Faucherie and Bowman lakes; drains many small lakes; dams at outlets of French, Faucherie, and Bowman lakes; fall of Canyon Creek below outlet of French Lake, 3,700 feet; fall below outlet of Bowman Lake, 2,450 feet; below Bowman Lake occupies deep canyon. Colfax sheet.

Canyon Creek (R); Placer County; rises in the northern part of T. 16 N., R. 11 E., at altitude 4,900 feet above sea level; flows southwestward 9 miles, then southeastward 1½ miles into North Fork of American River (tributary through American River to the Sacramento) 2 miles southeast of Gold Run; fall, 2,400 feet, of which 1,000 feet occurs in ½ mile at mouth. Colfax sheet.

Canyon Creek (R); Sierra County; rises on the southwestern slope of Mount Fillmore, at altitude 7,000 feet above sea level; flows in a very irregular but in general southwesterly course to its junction with North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); length, 21 miles; fall, 4,900 feet; tributaries, Little Canyon, Cars, and Rock creeks. Downieville and Bidwell Bar sheets.

Canyon Creek, Big (L); rises in Eldorado County, in the northwestern part of T. 10 N., R. 11 E., just north of Placerville, at altitude 2,200 feet above sea level; flows southwestward one-half mile and then northwestward 1½ miles into South Fork of American River (tributary through American River to the Sacramento); fall, 1,000 feet. Placerville sheet.

Canyon Creek, Little (L); rises in Sierra County, in the central part of T. 21 N., R. 10 E., on the south slope of Deadwood Peak, at altitude 6,300 feet above sea level; takes a circuitous but in general southwesterly course to its junction with Canyon Creek (tributary to North Fork of Yuba River, which flows through Middle Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); length, about 6 miles; fall, 2,300 feet. Downieville sheet.

Canyon Creek, North (L); Eldorado County; rises in the southeastern part of T. 11 N., R. 11 E., at altitude 3,200 feet above sea level; flows northwestward 3 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 1,600 feet. Placerville sheet.

Canyon Creek, North (R); Plumas County; rises in Round Valley Reservoir in T. 26 N., R. 9 E., at altitude 4,480 feet above sea level; flows northward about 2 miles into Wolf Creek (tributary through Indian Creek to North Fork of Feather River and thence through Feather River to the Sacramento); fall, 900 feet. Indian Valley special map.

Canyon Creek, South (L); rises in Eldorado County, in the northeastern part of T. 10 N., R. 11 E., at altitude 2,000 feet above sea level; flows northwestward 2½ miles

into South Fork of American River (tributary through American River to the Sacramento); fall, 1,500 feet. Placerville sheet.

Canyon Creek, South Fork (L); rises in Nevada County, in the southeastern part of T. 18 N., R. 12 E., in Island Lake, at altitude 6,900 feet above sea level; flows northward, passing through several small lakes to its junction with Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento) about halfway between Faucherie and Bowman lakes; length, 3 miles; fall, 1,000 feet. Colfax sheet.

Cape Horn Creek (L); rises in Shasta County, in the eastern part of T. 36 N., R. 1 W., at altitude 2,400 feet; flows southwestward about 4 miles to its junction with Pit River (tributary to Sacramento River); fall, 900 feet. Lassen Peak sheet.

Capell Creek (R); rises in Napa County, in the southwestern part of T. 7 N., R. 3 W.; flows northwestward into Soda Creek (tributary through Putah Creek to Yolo Basin); length, about 6 miles. Punnett's map of Napa County.

Cars Creek (L); rises in Sierra County, near the central part of T. 20 N., R. 10 E., at altitude 5,400 feet above sea level; flows west of north 2 miles into Canyon Creek (tributary to North Fork of Yuba River, which flows through Middle Fork of Yuba River to Yuba River, Feather River and the Sacramento); fall, 1,700 feet. Downieville sheet.

Cascade Creek (L); rises in Plumas County, in the northwestern part of T. 21 N., R. 8 E., on the south slope of Cammel Peak, at altitude 5,000 feet above sea level; flows westward into South Branch of Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 5 miles; fall, 1,300 feet. Bidwell Bar sheet.

Cascade Lakes; Placer County, southwestern part of T. 17 N., R. 14 E.; a group of glacial lakes lying on the north slope of Devil Peak, some connected and some having no outlet, the larger lakes discharging to streams flowing northwestward to South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); elevation, about 6,700 feet above sea level. Truckee sheet.

Castle Creek (R); rises in Shasta County, northwestern part of T. 38 N., R. 5 W., on the eastern slope of Trinity Mountains, at altitude 6,600 feet above sea level; flows somewhat south of east to its junction with Sacramento River near center of T. 38 N., R. 4 W., 3 miles southwest of Dunsmuir; length, about 8 miles; fall, 4,600 feet. Shasta sheet.

Castle Creek, Little (R); rises in southern Siskiyou County, near the center of T. 39 N., R. 4 W., on the eastern slope of Castle Rock, at altitude (approximate) 3,800 feet above sea level; flows southeastward about 4 miles to its junction with Sacramento River in Shasta County, in the northern part of T. 38 N., R. 4 W., 1 mile southwest of Dunsmuir; fall, about 1,600 feet. Shasta sheet.

Castle Lake; southern Siskiyou County, western part of T. 39 N., R. 4 W., northwest of Castle Rock; outlet, an unnamed (on the maps) stream about 5 miles long, flowing northeastward into Sacramento River in the southern part of T. 40 N., R. 4 W., 3 miles south of Sisson; elevation, 5,434 feet; fall of outlet, 2,034 feet. Shasta sheet.

Cedar Creek (L); rises in Colusa County, in the southern part of T. 17 N., R. 7 W.; flows eastward about 4 miles into Little Stony Creek (tributary through Stony Creek to Sacramento River). Punnett's map of Glenn and Colusa counties.

Cedar Creek, Placer County. See *Palisade Creek.*

Cedar Creek (R); Plumas County; rises in the southern part of T. 23 N., R. 12 E., at altitude 6,200 feet above sea level; takes a general course south of west to its junction with the Middle Fork of Feather River (tributary through Feather River to the Sacramento) opposite the mouth of Jamison Creek; length, about 2 miles; fall, 1,700 feet. Downieville sheet.

Cedar Creek (R); Shasta County; rises in the eastern part of T. 34 N., R. 1 W., on the southern slope of Round Mountain, at altitude 2,000 feet above sea level; flows

southwestward about 6 miles into Little Cow Creek (tributary to Cow Creek and thus to the Sacramento); fall, about 800 feet. Lassen Peak and Redding sheets.

Cedar Grove Ravine Creek (L); rises in Sierra County, in the northwestern part of T. 21 N., R. 10 E., on the west slope of Table Rock, at altitude 6,200 feet above sea level; flows southwestward 3 miles into Slate Creek (tributary to North Fork of Yuba River, which flows through Middle Fork of Yuba to Yuba River and thus through Feather River to the Sacramento); fall, 1,600 feet. Downieville sheet.

Chambers Creek (R); rises in Plumas County, in the southern part of T. 25 N., R. 6 E. (altitude 6,400 feet above sea level); flows southeastward about 5 miles into North Fork of Feather River (tributary through Feather River to the Sacramento); fall, about 4,500 feet, of which 2,500 feet occurs in 1½ miles at mouth. Bidwell Bar sheet.

Chambers Ravine Creek (L); rises in Butte County, in the western part of T. 20 N., R. 4 E., on the west slope of Table Mountain, at altitude 900 feet above sea level; flows southwestward about 12 miles into Dry Creek (tributary through Butte Creek to Butte Basin); water from Chambers Ravine reaches Dry Creek only in time of flood. The channel from Chambers Ravine receives also the drainage from Coal Canyon and Beatson Hollow creeks. Chico sheet.

Charcoal Ravine Creek (L); rises in Sierra County, in the eastern part of T. 19 N., R. 11 E., at altitude 6,200 feet above sea level; flows northwestward 2 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); fall, 2,500 feet. Downieville sheet.

Charlie Creek (R); rises in Shasta County, in the western part of T. 35 N., R. 5 W., at altitude 3,800 feet above sea level; flows southeastward 4½ miles to junction with Sacramento River 1 mile south of Gregory; fall, 2,800 feet. Redding sheet.

Chatterdowen Creek (L); rises in Shasta County, in the northwestern part of T. 36 N., R. 2 W., at altitude 2,800 feet above sea level; takes a general southwesterly course to its junction with McCloud River (tributary to Pit River and thus to the Sacramento); length, about 5 miles; fall, 1,600 feet; intermittent. Redding sheet.

Chatterdowen Creek, South Fork (L); rises in Shasta County, in the western part of T. 36 N., R. 2 W., at altitude 3,000 feet above sea level; flows northwestward to Chatterdowen Creek (tributary to McCloud River and thus through Pit River to the Sacramento); length, 3 miles; fall, 1,700 feet; intermittent. Redding sheet.

Chemisal Creek (R); rises in Colusa County in the southern part of T. 13 N., R. 4 W.; flows northward to Cortina Creek, which discharges into Colusa Basin; intermittent. Sheet E, Sacramento Valley map.

Cherokee Creek (R); Butte County; rises 1 mile north of Cherokee, in T. 21 N., R. 4 E., at altitude 1,000 feet above sea level; flows northeastward 1½ miles into West Branch of Feather River (tributary through Feather River to the Sacramento); fall, 300 feet. Chico sheet.

Cherokee Creek (R); Sierra County; rises in the northeastern part of T. 19 N., R. 9 E., at altitude 5,050 feet above sea level; flows southwestward to its junction with the North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba River and Feather River to the Sacramento); length, 7 miles; fall, 2,800 feet. Downieville and Bidwell Bar sheets.

Chickahominy Slough; Yolo Basin, 3 miles north of Winters. Sheet L, Sacramento Valley map.

Chicken Ranch Slough; Sacramento County, Rancho del Paso; extends northeastward from Nigger Slough with which it is connected in times of flood. Brighton sheet.

Chico Creek, Big (L); rises in Tehama County, in the northern part of T. 26 N., R. 4 E., at altitude 5,000 feet above sea level; takes a general southwesterly course to its junction with the Sacramento about 5 miles west of Chico, in Butte County; length, about 45 miles; total fall, 4,890 feet; in the last 10 miles of its course it falls about 100

feet; in the upper 35 miles the drainage basin is very narrow, the maximum width being about 2 miles; slopes are steep, and the stream receives many short tributaries from both sides; above Chico the channel is divided, part of the water flowing through Sandy Gulch; connected with Mud Creek by a channel slough. In times of flood Chico Creek sends some of its water across banks into Little Chico Creek and into the network of sloughs to the south; these waters do not return to the river until the basins into and through which they flow are full and force reentry into the river channel near the mouth of Feather River. Chico sheet. See also *Butte Basin and Sutter Basin.*

Chico Creek, Little (L); rises in Butte County in the southern part of T. 24 N., R. 3 E., near Berdan, at altitude 3,200 feet above sea level; flows southwestward 27 miles; discharges into upper end of Butte Basin near Dover cut-off; flows through the town of Chico; fall in 18 miles from head to point where it leaves the hills, 3,000 feet, of which 1,700 feet occurs in 5 miles at the extreme head. Chico sheet.

Chino Creek (L); rises in Butte County, in the north-central part of T. 22 N., R. 5. E., on the south slope of Big Bar Hill, at altitude 3,500 feet above sea level; flows southward 5 miles to junction with North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 3,200 feet. Bidwell Bar sheet.

Chip Creek (R); rises in Plumas County in the northeastern part of T. 25 N., R. 5 E., at altitude 6,000 feet above sea level; flows southeastward 8 miles into the North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 4,000 feet. Lassen Peak sheet.

Chipmunk Creek (L); rises in Placer County, in the northeastern part of T. 14 N., R. 13 E., at altitude 6,000 feet above sea level; flows southwestward 3 miles into Middle Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,500 feet. Truckee sheet.

Chunk Creek (R); rises in Eldorado County, in the northeastern part of T. 10 N., R. 11 E., at altitude 2,200 feet above sea level; flows southwestward 3 miles into Webber Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 1,100 feet. Placerville sheet.

Church Creek (R); rises in Sierra County, in the eastern part of T. 21 N., R. 12 E., at altitude 7,000 feet above sea level; flows westward 4 miles into Gold Lake; passes through several small lakes; fall, about 700 feet. Downieville sheet.

Churn Creek (L); rises in Shasta County, in the eastern part of T. 33 N., R. 5 W., at altitude 1,500 feet above sea level; flows southward 18 miles into Sacramento River, which it enters in the southern part of T. 31 N., R. 4 W.; fall, 1,100 feet; intermittent; many small, intermittent tributaries. Red Bluff and Redding sheets.

Claiborne Creek (L); rises in Shasta County, in western part of T. 37 N., R. 2 W., at altitude 3,200 feet above sea level; flows northwestward about 3 miles to junction with McCloud River (tributary through Pit River to the Sacramento); fall, 1,650 feet. Shasta sheet.

Clark Creek (R); rises in Shasta County, near center of T. 38 N., R. 2 E., at altitude 4,600 feet; flows southward 8 miles into Pit River (through which it is tributary to Sacramento River) near Pecks; fall, 2,100 feet, of which 1,500 feet occurs in the lower 4 miles of course. Modoc Lava Bed sheet.

Clark's Creek. See *West Valley Creek.*

Clark Slough (R); Tehama County, Saucos Rancho; a channel about 2 miles long, extending westward from Sacramento River above Plumas Rapids. Vina sheet.

Clear Creek (L); Butte County; rises in the east central part of T. 22 N., R. 3 E., at altitude 2,100 feet above sea level; flows west of south to its junction with Dry Creek (tributary through Butte Creek to Butte Basin); length, about 12 miles; fall, 1,800 feet. Chico sheet.

Clear Creek (R); Butte County; rises in the southern part of T. 25 N., R. 4 E., just south of Inskip, at altitude 4,800 feet above sea level; flows southwestward 4 miles fnto Kanaka Creek (tributary through East Fork of Butte Creek and Butte Creek to Butte Basin); fall, 1,900 feet. Chico sheet.

Clear Creek (L); Nevada County; rises in the southern part of T. 16 N., R. 8 E., at altitude 2,300 feet above sea level; flows southwestward 2 miles, then northwestward 3 miles into Squirrel Creek (tributary through Deer Creek to Yuba River and thus through Feather River to the Sacramento) at the head of Penn Valley; fall, about 900 feet. Smartsville sheet.

Clear Creek (L ; Plumas County; rises in the western part of T. 24 N., R. 8 E., on the eastern slope of Spanish Peak (altitude 7,047 feet above sea level); flows eastward about 6 miles into Rock Creek (tributary to Spanish Creek and thence through Indian Creek to North Fork of Feather River, to Feather River, and to the Sacramento); fall, about 3,300 feet, of which 2,500 feet occurs in the first 2 miles of course; many small tributaries. Bidwell Bar sheet.

Clear Creek (R); Plumas County; rises in the northwestern part of T. 25 N., R. 10 E., at altitude about 6,400 feet above sea level; flows southwestward 3½ miles into Spanish Creek (tributary to Indian Creek through North Fork of Feather River to Feather River and into the Sacramento); fall, about 3,500 feet; intermittent at head; many small intermittent tributaries. Indian Valley special map.

Clear Creek (R); Shasta County; rises in the northern part of T. 36 N., R. 6 W., at altitude 4,800 feet above sea level; flows southward along the east base of Trinity Mountains about 20 miles, then turns and flows southeastward to its junction with Sacramento River about 6 miles below Redding; length, 44 miles; fall, 4,400 feet, of which 3,000 feet occurs in about 6 miles at head; many small tributaries, Red Bluff sheet.

Clear Creek (R); Yuba County; rises in central part of T. 19 N., R. 8 E., at altitude 2,900 feet above sea level; flows southward 2 miles into Willow Creek (tributary to North Fork of Yuba River and thus through Middle Fork of Yuba, Yuba, and Feather rivers to the Sacramento); fall, 900 feet. Smartsville sheet.

Clear Creek, East Fork (L); rises in Shasta County, in the central part of T. 34 N., R. 6 W., 3,800 feet above sea level; flows southwestward into Clear Creek (tributary to Sacramento River); length, 5 miles; fall, 2,300 feet. Red Bluff sheet.

Clear Creek, South Fork (R); rises in Shasta County, in the northeast part of T. 31 N., R. 7 W., southeast of Bally Mountain, at altitude 3,000 feet above sea level; flows southeastward into Clear Creek (tributary to Sacramento River) near Piety Hill; length, 5 miles; fall, 2,100 feet. Red Bluff sheet.

Clear Lake; Lake County, central part; principal inlets Scott, Middle and Clover creeks from the west, Doba, Kelsey, and Cole creeks from the south. These creeks are torrential during the rainy season but are practically dry in summer; outlet Cache Creek to Yolo Basin. Cole Creek is not named on the maps.

The lake is very irregular in shape, is 20 miles long and 7 miles in maximum width, its area is 65 miles, and its elevation at mean level is 1,325 feet above sea level. The greatest depth of the principal part or main lake is 35 feet; in the lower neck are a few small areas at least 50 feet deep. The drainage area tributary to the lake comprises about 417 square miles and lies chiefly to the south and west.

Punnett's map of Mendocino and Lake counties, 1908; Water-Supply Paper U. S. Geol. Survey No. 45, 1901.

Clear Lake; Modoc County, southeastern part; 4 miles west of Eagle Peak; one inflowing stream—South Fork of Pit River; outlet, South Fork of Pit River to Pit River, a tributary of the Sacramento; elevation, 5,808 feet. Alturas sheet.

Clikapudi Creek (L); rises in Shasta County, in the north-central part of T. 33 N., R. 3 W., at altitude 1,300 feet above sea level; flows northeastward 2 miles into Pit River (tributary to Sacramento River); fall, 500 feet. Redding sheet.

Clipper Creek (L); rises in Nevada County, in the central part of T. 16 N., R. 9 E., at altitude 3,400 feet above sea level; flows somewhat south of west 4 miles into Little Greenhorn River (tributary to Bear River and thus through Feather River to the Sacramento); fall, 900 feet. Colfax sheet.

Clipper Creek (R); rises in Placer County, in the northern part of T. 13 N., R. 9 E., at altitude 2,000 feet above sea level; flows southwestward 6 miles into North Fork of American River (tributary through American River to the Sacramento) about 3 miles northeast of Auburn; fall, 1,400 feet. Placerville and Sacramento sheets.

Clough Creek (L); rises in Shasta County, in the extreme western part of T. 32 N., R. 3 W., 1½ miles west of Bellavista, at altitude 650 feet above sea level; flows west of south 3½ miles into Stillwater Creek (tributary to Sacramento River); fall, about 100 feet; intermittent. Redding sheet.

Clough Gulch Creek (L); rises in Shasta County, in the western part of T. 31 N., R. 1 W., at altitude 1,600 feet above sea level; flows southwestward 2 miles, then northwestward 3 miles into South Fork of Cow Creek (tributary through Cow Creek to Sacramento River); fall, about 900 feet; intermittent. Redding sheet.

Clover Creek (L); rises in Lake County in the southeastern part of T. 16 N., R. 9 W.; flows south of west about 6 miles into Middle [Cache] Creek (tributary to Cache Creek and thus to Yolo Basin) at upper lake. Punnett's map of Lake County.

Clover Creek (R); rises in Shasta County, in the northeastern part of T. 33 N., R. 1 E., at altitude 3,000 feet above sea level; flows irregularly southwestward into Cow Creek (tributary to Sacramento River); length, about 28 miles; fall, 2,450 feet, of which 1,000 feet occurs in the first 5 miles of course. Lassen Peak, Red Bluff, and Redding sheets.

Coal Canyon Creek (R); rises in Butte County, in the northwestern part of T. 20 N., R. 4 E., at altitude 1,300 feet above sea level; flows south of west 3½ miles, then west of south 3 miles into Chambers Ravine Creek (tributary through Dry Creek to Butte Basin); fall, 1,100 feet, of which 900 feet occurs in about 3 miles at head. Chico sheet.

Cogswell Creek (R); rises in Plumas County in the north central part of T. 23 N., R. 12 E., at altitude 6,200 feet above sea level; flows south of west 2 miles into Jackson Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento) 1 mile west of Cromberg; fall, 1,800 feet. Downieville sheet.

Cold Creek (L); rises in Butte County, in the eastern part of T. 24 N., R. 4 E., at altitude 4,000 feet above sea level; flows southward into West Branch of Feather River (tributary to North Fork of Feather River and thence through Feather River to the Sacramento); length, 2 miles; fall, 1,000 feet. Chico sheet.

Cold Creek (L); rises in Siskiyou County, on the east slope of Mount Shasta, at altitude 7,400 feet above sea level; flows southeastward; discharges flood waters to Ash Creek (tributary through springs issuing from lava beds to McCloud River, which flows into the Pit and thus into the Sacramento), but most of its water sinks into the lava beds to join the underground drainage tributary to the McCloud. Shasta sheet.

Cold Fork of Cottonwood Creek. See *Cottonwood Creek, Cold Fork.*

Coldwater Creek (L); rises in Plumas County, in the south-central part of T. 23 N., R. 7 E., on the south slope of Grizzly Hill, at altitude 5,700 feet above sea level; flows southwestward 3 miles, then northwestward 1 mile into Coquette Creek (tributary through Little North Fork of Feather River to Middle Fork of Feather River, and thus through Feather River to the Sacramento); fall, 1,000 feet. Bidwell Bar sheet.

Concow Reservoir. See *Spring Valley Reservoir.*

Colusa Basin; west side of Sacramento River, between mouth of Stony Creek and Grafton (Kings Landing); formed by a broad ridge 10 to 20 feet high which has been built up by Cache Creek across the west side of the valley from the foothills to the river. Cache Creek at present flows on the south slope of this ridge and discharges its water into the upper end of Yola Basin. Colusa Basin has no outlet except into the river to which it can discharge no water except at an elevation as great as that of the water in the river at Grafton. The basin receives the drainage from the entire Coast Range foothill region between the watersheds of Cache and Stony creeks and also all the water escaping from the channel of the Sacramento across its west bank at points between Stony Creek and Grafton.

In times of general flood when the water in this basin stands as high as the water in the river at Knights Landing, it becomes closely connected with Sutter Basin by water across the west and east banks of the river, and the two inland seas are practically one, the stage of water depending on the stage of the river at and below Grafton. A line of levees from Grafton up the west side of the river to a point near Stony Creek has been partly successful in preventing the spread of the water into the Colusa Basin, but waters from the Coast Range as well as flood waters from the river may cause general submersion of lands in the southern part of Colusa Basin. Before the waters were confined by levees, a general river flood converted the entire west side trough, from a point west of Princeton to the ridge at Grafton, into a narrow sea, nearly 50 miles long and 2 to 7 miles wide. The waters in this sea were all slowly moving from north to south and reentered Sacramento River through Lower Sycamore Slough at Grafton or across river banks. The amount of water which may have been spread over the entire west-side plain at a time of general flood before levees were built may have reached 45,000,000,000 cubic feet.

Several sloughs, natural high-water relief channels, lead westward from Sacramento River into Colusa Basin, and each of these sloughs has built up its banks above the general surface of the country. By reason of this building up of low, flat ridges into the basin from the river bank, which is itself 10 to 20 feet higher than the general surface of the bottom of the basin, the continuous slope of the bottom from north to south has been to some extent interrupted and a number of pockets have been formed which lie between or above the sloughs. Upper Sycamore Slough has in this way extended its course nearly across the west side trough and formed Colusa upper basin—Mormon Basin—which except in times of general flood is connected with the lower or main portion of Colusa Basin only by a narrow throat between Sycamore Slough and the higher west-side plain.

Sheets A to I, Sacramento Valley map. Report of Examining Commissioners on Rivers and Harbors to the Governor of California (C. T. Reed, C. E. Grunsky, J. J. Crawford, commissioners), Sacramento, 1890, pp. 64, 65.

Concow Creek (L); rises in Butte County, in the south central part of T. 23 N., R. 4 E., at altitude 3,000 feet above sea level; flows southwestward about 8 miles, passing through Spring Valley Reservoir to its junction with West Branch Feather River (tributary to North Fork of Feather River and thence through Feather River to the Sacramento); fall to head, 1,800 feet; fall in 4 miles below Spring Valley Reservoir 800 feet. The name Concow is also applied to a small creek flowing from the extreme southeastern part of T. 23 N., R. 4 E., into Concow Creek just below its entrance into the reservoir. This tributary creek is about 3 miles long and falls 1,000 feet. Bidwell Bar and Chico sheets.

Cook's Canyon Creek (R); rises in Plumas County near the center of T. 27 N., R. 10 E., at altitude 5,000 feet above sea level; flows southward about 8 miles, joins Lights Creek (tributary through Indian Creek to North Fork of Feather River and thus through Feather River to the Sacramento) in the swampy tract at the lower end of the north arm of Indian Valley; fall about 1,000 feet. Honey Lake sheet.

Coon Creek (L); rises in Placer County, in the northern part of T. 13 N., R. 7 E., 3 miles northwest of Auburn, at altitude 1,100 feet above sea level; flows northwestward 7 miles, then southwestward into American Basin, north of Murphy Lake; fall in the 7 miles through the foothills, 700 feet; intermittent; principal tributaries, Dry Creek and Doty Creek. Sacramento sheet.

Coquette Creek (L); rises in Plumas County, in the southwestern part of T. 23 N., R. 7 E., on the south slope of Grizzly Hill, at altitude 5,500 feet; flows southwestward into Little North Fork of Feather River (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); length, 2 miles; fall, 1,500 feet; tributary, Coldwater Creek. Bidwell Bar sheet.

Corbiere Slough; Colusa Basin, west side of Sacramento River extending southward from Dry Slough (an offshoot of Upper Sycamore Slough) 2 miles south of Sycamore. Sheet E, Sacramento Valley map.

Corral Lake; Sacramento County, Rancho del Paso, one-half mile north of American River, and 2½ miles north of east of Sacramento. Brighton sheet.

Cortina Creek (R); rises in Colusa County in the southeastern part of T. 13 N., R. 4 W., flows northwestward 6 miles, then north of east about 7 miles, and discharges into Colusa Basin in T. 14 N., R. 2 W., west of Sycamore Slough; intermittent. Sheet E, Sacramento Valley map.

Cortina Creek, Old (R); rises in Colusa County in the southeastern part of T. 14 N., R. 3 W., at altitude about 185 feet above sea level; flows northeastward and discharges into Colusa Basin west of Powell Slough; intermittent. Sheet E, Sacramento Valley map.

Cortina Creek, South Fork (R); rises in Colusa County in the southwestern part of T. 13 N., R. 4 W.; flows north about 3 miles to Cortina Creek, which discharges into Colusa Basin; intermittent. Sheet E, Sacramento Valley map.

Cottonwood Creek (R); Modoc County; rises about 8 miles northeast of Adin, at altitude (approximate) 5,800 feet above sea level; flows southeastward 8 miles, then southwestward 3 miles, and unites with Ash Creek (tributary to Pit River and thus to the Sacramento) at the lower end of Ash Creek valley; fall, about 900 feet. Alturas sheet.

Cottonwood Creek (L); Modoc County, northeastern part; rises on the western slope of Warner Mountains, at altitude 6,000 feet above sea level; flows northwestward 4 miles into Goose Lake, which at exceptionally high stages may be tributary to the North Fork of Pit River and thus through Pit River to the Sacramento; fall, 1,200 feet. Alturas sheet.

Cottonwood Creek (R); Shasta County; rises in the western part of T. 33 N., R. 5 W., at altitude 2,000 feet above sea level; flows southeastward 2½ miles into Sacramento River; fall, 1,450 feet (approximately); intermittent. Redding sheet.

Cottonwood Creek (R); Shasta and Tehama counties, between which it forms the boundary; formed by junction of Middle and North forks, of which Middle Fork may be considered the continuation of the main stream.

Middle Fork rises in the southeastern part of T. 30 N., R. 10 W., on the eastern slope of Trinity Mountains, and winds eastward; it is about 30 miles long, falls 5,900 feet (from the crest of the range), and drains 261 square miles; it joins the North Fork (q. v.) a short distance below Gas Point.

Below the forks the Cottonwood flows eastward, discharging into the Sacramento about 5 miles east of the town of Cottonwood, opposite the mouth of Battle Creek; measured at the mouth of the creek, the drainage area comprises 929 square miles; about two thirds of the area is more than 1,000 feet above sea level. Below the North Fork the principal tributary is the South Fork.

Precipitation in the basin of the Cottonwood ranges from 25 inches in the lower part to more than 50 inches along the crest of the Coast Range.

Gaging station on the North Fork at Ono, 1907–1909.

Red Bluff sheet.

Cottonwood Creek (R); Yolo County; rises in the eastern part of T. 19 N., R. 2 W.; flows northeastward and discharges to Yolo Basin through Cottonwood Slough. Punnett's map of Yolo County; sheets I and K, Sacramento Valley map.

Cottonwood Creek, Cold Fork (L); rises in Tehama County, in the southeastern part of T. 27 N., R. 10 W., on the east slope of North Yolla Bolly Mountain, at altitude 6,000 feet above sea level; flows in a general easterly direction about 22 miles to its junction with the South Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River); fall, 5,200 feet. Red Bluff sheet.

Cottonwood Creek, Middle Fork. See *Cottonwood Creek.*

Cottonwood Creek, North Fork (L); rises in Shasta County, in the southwestern part of T. 32 N., R. 7 W., on the east slope of Bully Choop Mountain, at altitude 5,000 feet above sea level; flows very irregularly southeastward, and near Gas Point unites with the Middle Fork to form Cottonwood Creek (tributary to Sacramento River); length, 20 miles; fall from source to mouth of Middle Fork, about 4,300 feet; drainage area, 112 square miles; principal tributaries, Jerusalem and Eagle creeks and Roaring River; gaging station near Ono. Red Bluff sheet.

Cottonwood Creek, South Fork (R); rises in Tehama County, in the eastern part of T. 27 N., R. 10 W., on the south slope of North Yolla Bolly Mountain, at altitude 5,000 above sea level; flows southeastward about 10 miles, then northeastward 35 miles to its junction with Cottonwood Creek (tributary to Sacramento River) a few miles west of the town of Cottonwood; drainage area, 395 square miles; fall, 4,600 feet; principal tributaries, Cold Fork Cottonwood Creek and Salt Creek. Red Bluff sheet.

Cow Creek (L); formed in Shasta County, in the western part of T. 31 N., R. 2 W., at altitude 600 feet above sea level, by the union of Old Cow [1] and South Cow creeks. Old Cow Creek, which may be considered the continuation of the main stream, rises in the northeastern part of T. 32 N., R. 2 E., on the west slope of Crater Peak, at altitude 4,700 feet above sea level; flows northwestward about 3 miles, then takes a general southwesterly course to its junction with South Cow Creek 3 miles east of Millville. From the forks Cow Creek flows northwestward about 6 miles, then southward 7 miles to junction with Sacramento River; length, from mouth to head of Old Cow, about 40 miles; total fall, 4,350 feet; length of Old Cow Creek above South Cow, 28 miles, in which distance it falls 4,100 feet, of which 2,000 feet occurs in 4 miles at the head of the stream and 1,000 feet more in the next 8 miles below. Lassen Peak, Red Bluff, and Redding sheets.

Cow Creek, Little (R); rises in Shasta County, in the southeastern part of T. 34 N., R. 1 E., about 3,600 feet above sea level; flows westward to a point near Furnaceville, then southwestward to junction with Cow Creek (tributary to Sacramento River) 1½ miles below Palocedro; length, about 30 miles; fall, 3,050 feet, of which 2,200 feet occurs in about 8 miles at head of stream; many small intermittent tributaries. Lassen Peak, Red Bluff, and Redding sheets.

Cow Creek, South Fork (L); rises in Shasta County, in the northwestern part of T. 32 N., R. 3 E., on the north slope of Latur Butte, at altitude 5,100 feet above sea level; flows southwestward and then westward to the western part of T. 31 N., R. 2 W., where it unites with Old Cow Creek to form Cow Creek (tributary to Sacramento River); length, 27 miles; fall, 4,500 feet, of which more than 3,000 feet occurs in the first half of course. Lassen Peak, Red Bluff, and Redding sheets.

Cox Creek (R); rises in Yuba County in the northern part of T. 15 N., R. 6 E., at altitude 800 feet above sea level; flows southward 5 miles into Dry Creek (tributary to Feather River) at Cabbage Patch; fall, 500 feet. Smartsville sheet.

Coyote Creek (L); rises in Lassen County, in the southern part of T. 36 N., R. 9 E., at altitude (approximate) 5,500 feet above sea level; flows irregularly westward through Dixie Valley to the eastern part of T. 35 N., R. 7 E., where it turns and flows northwestward to its junction with Pit River (tributary to the Sacramento) 10 miles southeast of Pittville; length, about 18 miles; fall, 1,800 feet. On Lassen Peak sheet the lower part of this creek—below Dixie Valley—is called Horse Creek.

Coyote Creek (L); Placer County; rises in the central part of T. 14 N., R. 9 E., at altitude 2,400 feet above sea level; flows southwestward 3 miles, then northwestward 1 mile into Bear River (tributary through Feather River to the Sacramento); fall, 900 feet. Colfax and Smartsville sheets.

Coyote Creek, (R); Tehama County; rises in the western part of La Barranca Colorada Rancho, at altitude about 400 feet above sea level; flows somewhat south of east 10 miles into Sacramento River; fall, 200 feet; intermittent. Tehama sheet.

---

[1] Called North Fork of Cow Creek on Red Bluff sheet and on Denny's map of Shasta County.

Craig Creek (L); Tehama County, Rio de los Berrendos; one of several channels through which Antelope Creek discharges into the Sacramento; it leaves Antelope Creek just above the mouth of Little Antelope, flows somewhat west of south 1½ miles, and enters Sacramento River opposite Blackberry Island; fall, about 40 feet. Tehama sheet.

Crooked Lake; Nevada County, eastern part of T. 18 N., R. 12 E.; inlet South Fork of Canyon Creek, which flows through it to its junction with Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); elevation above sea level, 6,700 feet; below Island Lake, 100 feet. Colfax sheet.

Crow Creek (L); rises in Shasta County, in the southeast part of T. 30 N., R. 7 W., at altitude 800 feet above sea level; flows southeastward 6 miles into Roaring River (tributary to North Fork of Cottonwood Creek and thus through Cottonwood Creek to the Sacramento); fall, about 100 feet; tributary, Squaw Creek. Red Bluff sheet.

Crumbo Lake; Shasta County, southern part of T. 30 N., R. 4 E.; outlet, Mill Creek to Sacramento River; elevation, 7,500 feet. Lassen Peak sheet.

Crystal Lake; Nevada County, eastern part of T. 17 N., R. 12 E.; no outlet mapped, but near-by streams flow northward to South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation, 5,800 feet. Colfax sheet.

Crystal Lake; Plumas County, northwestern part of T. 25 N., R. 10 E., outlet a stream 1¾ miles long, flowing northward into Houghs Creek (tributary to Indian River and thence through North Fork of Feather River to Feather River and to the Sacramento); elevation, 6,650 feet. Indian Valley special map.

Culbertson Lake; Nevada County, T. 18 N., R. 12 E.; 1 inlet; outlet, a stream half a mile long flowing northwestward into Texas Creek (tributary to Canyon Creek which flows through South Fork of Yuba River, through Yuba and Feather rivers to the Sacramento); elevation, 6,750 feet; dammed at outlet; fall of outlet above Texas Creek, about 200 feet. Colfax sheet.

Curry Creek (L); rises in Placer County in the southeastern part of T. 11 N., R. 5 E., at altitude 120 feet above sea level; flows southwestward 1½ miles, then very irregularly northwestward 8 miles and discharges into American Basin; fall, 100 feet; intermittent; channel tortuous. Roseville, Pleasant Grove, and Vernon sheets.

Curtis Ravine Creek (R); rises in Plumas County in the southwestern part of T. 26 N., R. 9 E., at altitude 5,000 feet above sea level; flows southeastward 2 miles into Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 1,800 feet; intermittent. Indian Valley special map.

Dark Canyon Creek (L); Butte County; rises in the southeast part of T. 22 N., R. 4 E., at altitude 2,100 feet above sea level; flows irregularly southward into West Branch of Feather River (tributary to North Fork of Feather River and thus through Feather River to the Sacramento); length, about 5 miles; fall, 1,500 feet. Bidwell Bar and Chico sheets.

Dark Canyon Creek (R); Eldorado County; rises in the northwestern part of T. 11 N., R. 12 E., at altitude 3,400 feet above sea level; flows southeastward 1 mile into Slab Creek (tributary through South Fork of American River to American River and the Sacramento); fall, 1,200 feet. Placerville sheet.

Dark Canyon Creek (R); Placer County; rises in the western part of T. 15 N., R. 12 E., at altitude 4,900 feet above sea level; flows southward 2½ miles into North Fork of Middle Fork of American River (tributary through Middle Fork of American River to North Fork of American River and thus through American River to the Sacramento); fall 1,700 feet. Colfax sheet.

Date Creek (L); rises in Butte County, in the south-central part of T. 18 N., R. 5 E., at altitude 1,100 feet above sea level; flows southwestward into South Honcut Creek (tributary through Honcut Creek to Feather River and thus to the Sacramento); length, 10 miles; fall, 1,000 feet. Smartsville and Marysville sheets.

Davis Creek (L); rises in the eastern part of Modoc County, on the western slope of Warner Mountains, at altitude 6,000 feet above sea level; flows irregularly northwestward into Goose Lake, which at exceptionally high stages may discharge into North Fork of Pit River and thus through Pit River into the Sacramento; length, about 8 miles; fall, 1,200 feet. Alturas sheet.

Davis Creek (R); rises in Yolo County in the southeastern part of T. 12 N., R. 5 W.; flows northward 6½ miles into Cache Creek (tributary to Yolo Basin) 2 miles west of the mouth of Bear Creek; carries no water except during the rainy season. Water-Supply Paper U. S. Geol. Survey No. 45, 1901, map of Cache Creek basin (Pl. I), and p. 27.

Dead Mans Lake; Sacramento County, Rancho del Paso, 1 mile east of north of Sacramento, and one-half mile north of American River; marshy. Brighton sheet.

Dead Mans Lake; Sierra County, northwestern part of T. 20 N., R. 13 E., one-half mile north of Dead Mans Peak; outlet stream about three-fourth mile long flowing northwestward into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Feather River and thus to the Sacramento); elevation, 6,800 feet above sea level; fall of outlet, 1,000 feet. Downieville sheet.

Deadwood Creek (L); Butte County; rises in the southern part of T. 22 N., R. 4 E., at altitude 2,500 feet above sea level; flows south of west 2 miles into Canyon Creek (tributary to West Branch of Feather River, which flows to North Fork of Feather River and thus through Feather River to the Sacramento); fall, 1,100 feet. Chico sheet.

Deadwood Creek (R); Yuba County; rises in the central part of T. 20 N., R. 8 E., near North Star House, at altitude 4,000 feet above sea level; flows southward 5 miles into North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 2,000 feet. Bidwell Bar sheet.

Dean Valley Reservoir; Plumas County, northwestern part of T. 23 N., R. 9 E. on Rock Creek (tributary to Spanish Creek and thence through Indian Creek to the North Fork of Feather River, to Feather River, and to the Sacramento); elevation, 4,300 feet above sea level. Bidwell Bar sheet. Not shown on Punnett's map of Plumas County.

Deep Canyon Creek (L); Eldorado County; rises in the northwestern part of T. 12 N., R. 12 E., at altitude 4,000 feet above sea level; flows northward 2 miles into Pilot Creek (tributary through Rubicon River to Middle Fork of American River and thus through North Fork of American and American rivers to the Sacramento); fall, 1,000 feet. Placerville sheet.

Deep Canyon Creek (L); Placer County; rises in the central part of T. 15 N., R. 13 E., on the west slope of Duncan Peak, at altitude 6,500 feet above sea level; flows southwestward 4 miles then northwestward 1½ miles into North Fork of Middle Fork of American River (tributary through Middle Fork of American to North Fork of American and thus through American River to the Sacramento); fall, 3,000 feet. Colfax sheet.

Deephaven Gulch Creek (R); rises in Tehama County, in the eastern part of T. 27 N., R. 2 W., 1,000 feet above sea level; flows north of west 1½ miles, then southward 2 miles into Little Antelope Creek (tributary to Antelope Creek and thus to the Sacramento); fall, 610 feet; intermittent. Tehama sheet.

Deer Creek (L); Eldorado County; rises in the north central part of T. 13 N., R. 14 E., at altitude 5,900 feet above sea level; flows southwestward 3 miles into Rubicon River (tributary through Middle Fork of American River to North Fork of

American River and thus through American River to the Sacramento); fall, 1,900 feet. Truckee and Pyramid Peak sheets.

Deer Creek (L); Nevada County; formed in the southwestern part of T. 17 N., R. 10 E., by union of North and South forks. The North Fork rises in the western part of T. 17 N., R. 11 E., at altitude 4,400 feet above sea level, and flows somewhat south of west; the South Fork rises in the southwestern part of T. 17 N., R. 11 E., 1 mile south of the head of the North Fork, at altitude 4,500 feet above sea level and flows westward. Each fork is about 5 miles long and falls 1,300 feet above the junction. Below the forks Deer Creek takes a general course somewhat south of west to its junction with Yuba River (tributary through Feather River to the Sacramento); length, 27 miles; fall between Yuba and the head of North Fork, about 4,200 feet, of which 2,000 feet occurs in the 12 miles east of Nevada City; total fall is 4,200 feet. Colfax and Smartsville sheets.

Deer Creek (R); Plumas County; rises in the southern part of T. 24 N., R. 9 E., at altitude 5,500 feet above sea level; flows northwestward 2½ miles into Rock Creek (tributary to Spanish Fork and thence through Indian Creek to the North Fork of Feather River to Feather River and into the Sacramento); total fall, 1,100 feet. Downieville and Bidwell Bar sheets.

Deer Creek (L); Sierra County; rises in the western part of T. 20 N., R. 13 E., at altitude 7,600 feet above sea level; flows irregularly northwestward into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River and Yuba River to Feather River and thus to the Sacramento); length 5 miles; fall 2,000 feet. Downieville sheet.

Deer Creek (L); Tehama County; rises in the southwestern part of T. 29 N., R. 5 E., about 4,900 feet above sea level; flows southeastward 4 miles, then takes a general southwesterly course to its junction with the Sacramento in Rio de los Molinos Rancho, 1¼ miles west of Vina; length, about 50 miles; total fall, 4,720 feet; many small unnamed tributaries. Lassen Peak and Vina sheets.

Deer Creek, Little (L); rises in Nevada County in the central part of T. 16 N., R. 9 E., at altitude 3,400 feet above sea level; flows north of west to its junction with Deer Creek (tributary through Yuba River to Feather River and thus to the Sacramento) at Nevada City; length, 4 miles; fall, 1,000 feet. Colfax and Smartsville sheets.

Deer Flat Creek (L); rises in Shasta County, near the center of T. 31 N., R. 3 E., about 6,000 feet above sea level; flows westward 8 miles into the North Fork of Battle Creek (tributary through Battle Creek to the Sacramento); fall, about 2,000 feet; principal tributary, Manzanita Creek from Manzanita Lake. Lassen Peak sheet.

Deer Lake; Sierra County, southwestern part of T. 21 N., R. 12 E.; outlet a stream 2 miles long, flowing eastward to the stream connecting Lower Salmon Lake with the North Fork of the North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); elevation, 7,050 feet; fall of outlet, 900 feet. Downieville sheet.

Dekkas Creek (R); rises in Shasta County, in the eastern part of T. 35 N., R. 3 W., on the south slope of Salt Creek Mountain, at altitude 3,500 feet above sea level; flows southwestward 1 mile, then northwestward about 3 miles into McCloud River (tributary through Pit River to the Sacramento); fall, 2,550 feet. Redding sheet.

Delta Lake; southern part of Modoc County, 6 miles northwest of South Fork (Pit River) Peak; 2 small inlets; no outlet; elevation, approximate, 5,800 feet. Alturas sheet.

Devils Canyon Creek (L); rises in Placer County in the southeastern part of T. 14 N., R. 10 E., near Forest Hill, at altitude 2,900 feet above sea level; flows northwestward 3½ miles into Shirttail Canyon Creek (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,800 feet. Colfax sheet.

Diamond Creek (L); rises in Nevada County in eastern part of T. 17 N., R. 11 E., at altitude 4,900 feet above sea level; flows northwestward 3 miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 1,900 feet. Colfax sheet.

Didallas Creek (R); rises in Shasta County, in the southeastern part of T. 35 N., R. 3 W., on the east slope of Minnesota Mountain, 2,500 feet above sea level; flows southeastward 3 miles into Squaw Creek (tributary to Pit River and thus to the Sacramento); fall, 1,500 feet. Redding sheet.

Dibble Creek (R); rises in Tehama County, in the northwestern part of T. 27 N., R. 5 W., at altitude 1,000 feet above sea level; flows eastward 10 miles, then southeastward 4 miles to junction with Sacramento River 1 mile above Red Bluff; fall, 700 feet. Red Bluff and Tehama sheets.

Digger Creek (L); rises in Shasta and Tehama counties, in T. 30 N., R. 3 E., at altitude 6,000 feet above sea level; flows westward along the Shasta-Tehama county boundary 18 miles to junction with North Fork of Battle Creek (tributary through Battle Creek to Sacramento River); fall, 4,700 feet, of which 3,000 feet occurs in about 5 miles at head. Lassen Peak sheet.

Dixie Creek (R); rises in Plumas County in the central part of T. 26 N., R. 9 E., one-half mile east of the southern end of Round Valley Reservoir, at altitude 4,500 feet above sea level; flows southward 1½ miles into Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 1,000 feet. Indian Valley special map.

Dixie Creek (R); rises in Plumas County, in the western part of T. 24 N., R. 15 E., on the west slope of Dixie Mountain, at altitude 7,000 feet above sea level; flows irregularly northwestward about 8 miles (passing through Dixie Valley), southwestward 3 miles, then somewhat north of west 2 miles to junction with Red Clover Creek (tributary through Indian Creek to North Fork of Feather River, and thus through Feather River to the Sacramento) in Red Clover Valley; fall, about 1,500 feet. Sierraville sheet.

Doba Creek (R); rises in Lake County in the northern part of T. 13 N., R. 10 W., on the eastern slope of the Cascade Range; flows southeastward 3 miles, then east of north 8 miles into Clear Lake (outlet Cache Creek to Yolo Basin) 3 miles southeast of Lakeport. Punnett's map of Lake County.

Dobbins Creek (R); rises in Yuba County in the northeastern part of T. 18 N., R. 7 E., at altitude 2,500 feet above sea level; flows southward 8 miles into Middle Fork of Yuba River (tributary through Yuba to Feather River and thus to the Sacramento); fall, 1,900 feet. Smartsville sheet.

Dodge Creek (R); rises in Shasta County, in the southern part of T. 35 N., R. 7 W., on the east slope of Trinity Mountains, at altitude 3,500 feet above sea level; flows southeastward into Clear Creek (tributary to Sacramento River); length, 3 miles; fall, 1,700 feet. Red Bluff sheet.

Dog Creek (R); rises in Shasta County, in the southern part of T. 36 N., R. 6 W.; flows irregularly eastward to its junction with Sacramento River at Delta, in T. 36 N., R. 5 W.; length, about 6 miles; fall, approximately 2,000 feet; principal tributary, Middle Fork. Red Bluff and Redding sheets.

Dog Creek, Middle Fork (L); rises in Shasta County, in the western part of T. 35 N., R. 5 W., on the eastern slope of Trinity Mountains, at altitude (approximate) 3,500 feet above sea level; flows northward to its junction with Dog Creek, a tributary of the Sacramento; about 2 miles long; fall, 2,000 feet; intermittent at head and receives many very small intermittent tributaries. Redding sheet.

Dogwood Creek (L); rises in Plumas County in the western part of T. 22 N., R. 9 E., on the western slope of Fowler Peak, at altitude 5,500 feet above sea level; flows northwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 3½ miles; fall, 2,600 feet. Bidwell Bar sheet.

Doney Creek (R); rises in Shasta County, in the northern part of T. 35 N., R. 5 W., at altitude 3,000 feet above sea level; flows southeastward 3½ miles to its junction with Sacramento River at Gregory; fall, about 2,000 feet. Redding sheet.

Doty Creek (L); rises in Placer County in the northeastern part of T. 12 N., R. 7 E., 1 mile north of Ophir, at altitude 1,000 feet above sea level; flows northwestward 6 miles, then westward 6 miles into Coon Creek which flows into American Basin; fall, about 800 feet, of which 500 feet occurs in 3 miles at head. Placerville sheet. See also Lincoln sheet.

Dry Creek (L); Butte County; rises in the southeastern part of T. 22 N., R. 3 E., at altitude 1,700 feet above sea level; flows almost due south 7 miles, southwestward 8 miles, then in general southwestward to its junction with Butte Creek in Butte Basin, northwest of Marysville Buttes; as it leaves the foothills near Cherokee flows in many interlacing channels; intermittent below hills; principal tributary Clear Creek; called Table Mountain Creek on Land Office map. Chico and Marysville sheets.

Dry Creek (L); Eldorado County; rises in the southern part of T. 10 N., R. 10 E., near El Dorado, at altitude 1,500 feet above sea level; flows northwestward 6 miles into Webber Creek (tributary through South Fork American River to American River and thus to the Sacramento); fall, 500 feet. Placerville sheet.

Dry Creek (R); Nevada County; rises in the southeastern part of T. 14 N., R. 8 E., at altitude 1,800 feet above sea level; flows southwestward into Bear River (tributary through Feather River to the Sacramento); fall, 700 feet. Smartsville sheet.

Dry Creek (L); Nevada County; rises in the western part of T. 15 N., R. 8 E., 2 miles west of Forest Spring, at altitude 2,100 feet above sea level; flows very irregularly southwestward and discharges into a basin lying north of Bear River and south of Plumas Lake; emerges from the foothills near Spenceville. Except in times of flood its lower channels are dry. Principal tributaries Indian Spring, Little Dry and Cox creeks. Smartsville and Marysville sheets; see also Wheatland, Ostrom, and Nicolaus sheets.

Dry Creek (R); Placer County; rises in the eastern part of T. 13 N., R. 7 E., where it is formed by the junction of its North and South forks. The North Fork rises in the eastern part of T. 13 N., R. 8 E., 1½ miles northwest of Clipper Gap, at altitude 1,700 feet above sea level and flows west and south of west. The South Fork rises 1 mile northeast of Clipper Gap in T. 13 N., R. 9 E., at altitude 2,000 feet above sea level, flows southwestward 3 miles, then north of west to its junction with the North Fork. From this junction Dry Creek flows westward into Coon Creek which discharges into American Basin. Fall of the North Fork above the junction, 800 feet; fall of South Fork above the junction, 1,100 feet; intermittent. Placerville sheet.

Dry Creek, Placer and Sacramento counties. See *Linda Creek.*

Dry Creek (R); Shasta County; rises in the western part of T. 33 N., R. 3 W., on the east slope of Bear Mountain, at altitude about 900 feet above sea level; flows southward 6 miles into Little Cow Creek (tributary to Cow Creek and thus to the Sacramento); fall, 400 feet; intermittent. Redding sheet.

Dry Creek (L); Tehama County; rises in the southern part of T. 28 N., R. 9 W., at altitude 3,000 feet above sea level; flows eastward about 15 miles into Salt Creek (tributary to South Fork of Cottonwood Creek and thus through Cottonwood Creek to the Sacramento); fall, 2,300 feet. Red Bluff sheet.

Dry Creek (R); Yuba County; rises in the southeastern part of T. 19 N., R. 6 E., at altitude 2,200 feet above sea level; formed by junction of New York and Slate creeks; takes a very irregular but in general southwesterly course to its junction with Yuba River (tributary through Feather River to the Sacramento) near Browns Valley; length, 22 miles; fall, 2,100 feet; principal tributaries Indiana and Willow Glen creeks. Smartsville sheet.

Dry Creek, Little (L); Butte County; rises in the central part of T. 22 N., R. 3 E., near Paradise, at altitude 1,800 feet above sea level; flows west of south about 12

miles; sinks before reaching Butte Creek; intermittent; fall, 1,600 feet. Chico sheet.

Dry Creek, Little (R); Nevada County; rises in the northeastern part of T. 15 N., R. 6 E., at altitude 1,400 feet above sea level; flows southward 5 miles into Dry Creek (tributary through Feather River to the Sacramento) at Spencerville; fall, 1,000 feet. Smartsville sheet.

Dry Creek, North and South forks. See *Dry Creek.*

Dry Slough; Colusa County, west side of Sacramento River extending southward from Sycamore Slough near Sycamore. Sheet E, Sacramento Valley map.

Dry Slough; a tributary of Willow Slough in Yolo Basin, joins Willow Slough about 4 miles northwest of Davisville. Sheet L, Sacramento Valley map.

Duck Slough; a channel leading from the south end of Big Lake through Yolo Basin to Miner Slough; tidal. Sheet M, Sacramento Valley map.

Dulzura Lake. See *Sereno Lake.*

Duncan Creek (R); rises in Placer County in the northeastern part of T. 15 N., R. 14 E., at altitude 7,000 feet above sea level; flows southwestward 12 miles into Middle Fork of American River (tributary to North Fork of American River and thus through American River to the Sacramento); fall, 3,000 feet. Truckee sheet.

Duncan Creek (L); Shasta County; formed by union of West, Middle, and East forks in the central part of T. 30 N., R. 8 W. The Middle Fork, which may be considered the continuation of the main stream, rises in the southwestern part of T. 31 N., R. 8 W., on the east slope of Bully Choop Mountains, about 4,500 feet above sea level, and flows southward, uniting with the East Fork; below the forks the creek flows southward into Middle Fork of Cottonwood Creek (tributary through Cottonwood Creek to the Sacramento) at Parks; length, to head of Middle Fork, about 9 miles; fall, 3,400 feet. Red Bluff sheet.

Duncan Creek, East Fork (L); Shasta County; rises in the southern part of T. 31 N., R. 8 W., on the east slope of Bully Choop Mountains, at altitude 3,800 feet above sea level; flows southward about 5 miles into Duncan Creek (tributary to Middle Fork of Cottonwood Creek and thus through Cottonwood Creek to the Sacramento) half a mile below the junction of the West and Middle forks; fall, about 1,800 feet. Red Bluff sheet.

Duncan Creek, West Fork (R); rises in Shasta County, in the northern part of T. 30 N., R. 9 W., on the east slope of Bully Choop Mountains, at altitude 4,000 feet above sea level; flows eastward, and unites with Middle Fork to form Duncan Creek; length, about 5 miles; fall, 2,000 feet. Red Bluff sheet.

Dunnigan Creek (R); rises in Yolo County in the western part of T. 12 N., R. 1 W., flows eastward into Colusa Basin near Dunnigan; intermittent. Sheet F, Sacramento Valley map.

Dutch Creek (L); rises in Eldorado County, in the northeastern part of T. 11 N., R. 10 E., at altitude 2,300 feet above sea level; flows south of west 3 miles into Irish Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 1,100 feet. Placerville sheet.

Dutch Gulch Creek (R); rises in Shasta County, in the northwestern part of T. 33 N., R. 7 W., at altitude 4,000 feet above sea level; flows southeastward into Clear Creek (tributary to Sacramento River); length, 3½ miles; fall, 2,600 feet. Red Bluff sheet.

Dutch Ravine Creek (L); rises in Placer County in the western part of T. 12 N., R. 8 E., at altitude 1,300 feet above sea level; flows westward 4 miles, then northwestward 2 miles into Auburn Ravine (tributary through Bunkham Slough to American Basin) near Gold Hill; fall, 1,100 feet; intermittent. Sacramento sheet.

Eagle Creek (L); rises in Shasta County, in T. 31 N., R. 7 W., at altitude 2,800 feet above sea level; flows southward 4 miles into North Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River) near Ono; fall, 2,200 feet. Red Bluff sheet.

Eagle Gulch Creek (L); rises in Butte County, in the western part of T. 20 N., R. 8 E., at altitude 3,500 feet above sea level; flows northwestward 2 miles into Lost Creek (tributary to South Fork of Feather River, which flows through Middle Fork of Feather River to Feather River and thus to the Sacramento); fall, 450 feet. Bidwell Bar sheet.

East Branch or Fork. See name of main stream.

Echo Lake; Eldorado County, southeastern part of T. 12 N., R. 17 E., and northeastern part of T. 11 N., R. 17 E.; inlet, a stream draining 3 small lakes; this lake is without natural outlet but the water is led by aqueduct tunnel into the South Fork of American River (tributary through American River to the Sacramento) just north of Audrain Lake. Pyramid Peak sheet.

Echo Lake; Plumas County; southeastern part of T. 30 N., R. 7 E.; outlet, Rock Creek to Hamilton Branch of Feather River (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); elevation above sea level, about 6,000 feet. Punnett's map of Plumas County.

Elder Creek (R); formed in Tehama County by the junction of its North and South forks. The North Fork, which may be considered the continuation of the main stream, rises in the northwestern part of T. 25 N., R. 8 W., 4 miles east of Mount Linn at altitude 6,600 feet above sea level. The creek flows eastward and enters Sacramento River 1½ miles north of Tehama; length, about 40 miles; fall, 6,400 feet, of which 4,600 feet occurs in 8 miles at the head of the North Fork, and more than 1,000 feet more in the next 10 miles; intermittent in lower course; principal tributaries, South Fork and Willow Creek (Spring Branch). Red Bluff and Tehama sheets.

Elder Creek, South Fork (R); rises in Tehama County, in the northern part of T. 24 N., R. 8 W.; flows northeastward 3 miles, eastward 2 miles, southeastward 3 miles, then northeastward 6 miles; unites with North Fork to form Elder Creek (tributary to Sacramento River) near Lowry. Punnett's map of Tehama County.

Eldorado Creek (R); rises in Placer County, in the eastern part of T. 15 N., R. 11 E., near Forks House, at altitude 4,800 feet above sea level; flows southward about 8 miles through Forks House Ravine into North Fork of Middle Fork of American River (tributary through Middle Fork of American to North Fork of American and thus through American River to the Sacramento); fall, 3,100 feet; tributary Indian Creek. Colfax sheet.

Elk Creek (L); rises in Colusa County, in the eastern part of T. 13 N., R. 3 W.; flows northeastward to Salt Creek (which discharges into Colusa Basin) near Arbuckle. Sheet E, Sacramento Valley map.

Elk Creek (L); rises in Glenn County, in the northeastern part of T. 20 N., R. 8 W.; flows eastward about 10 miles, and unites with Stony Creek (tributary to Sacramento River) about 5 miles west of Fruto. Punnett's map of Glenn and Colusa counties.

Elkhorn Slough; Yolo Basin; extends southwestward from Sacramento along the west side of Merritt Island, east of Big Lake and Duck Slough. Sheet M, Sacramento Valley map.

Emigrant Creek (L); rises in Plumas County, in the eastern part of T. 24 N., R. 11 E., at altitude 7,000 feet above sea level; flows northeastward 3 miles into Little Grizzly Creek (tributary to Indian Creek which flows into North Fork of Feather River and thence through the Feather River to the Sacramento); total fall, about 1,400 feet. Downieville sheet.

Empire Creek (L); rises in Butte County, in T. 23 N., R. 4 E., at altitude 3,300 feet above sea level; flows northwestward 2 miles into West Branch of Feather River (tributary to North Fork of Feather River and thence through Feather River to the Sacramento); fall, 1,300 feet. Chico sheet.

Empire Creek (L); rises in Eldorado County, in the northern part of T. 12 N., R. 10 E., near Georgetown, at altitude 2,500 feet above sea level; flows southward 4

miles, and unites with Manhattan Creek to form Irish Creek (tributary to South Fork of American River, and thus through American River to the Sacramento); fall, 600 feet. Placerville sheet.

Encinosa Creek (R); rises in Solano County, in the eastern part of T. 6 N., R. 22 W., at altitude 1,500 feet above sea level; flows eastward 3 miles into Alamo Creek (tributary to Cache Slough, Yolo Basin). Napa sheet.

Estray Creek (R); rises in Plumas County, in the eastern part of T. 24 N., R. 11 E., on the southern slope of Grizzly Mountain, at altitude 7,000 feet above sea level; flows southwestward 5 miles into Spring Garden Creek (tributary to Spanish Creek which flows through Indian Creek to the North Fork of Feather River and thus through Feather River into the Sacramento); total fall, 3,000 feet of which 2,000 feet occurs in the first 2 miles at head. Downieville sheet.

Eticuera Creek (L); rises in Napa County, in the northwestern part of T. 11 N., R. 4 W.; takes a general southerly course to its junction with Putah Creek (tributary to Yolo Basin) in the western part of Rancho Las Putas, about 5 miles northwest of Monticello; length about 16 miles. Punnett's map of Napa County.

Eureka Creek (L); rises in Plumas County in Eureka Lake in the eastern part of T. 22 N., R. 11 E., at altitude 6,200 feet above sea level; flows somewhat east of north 3 miles into Jamison Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); fall from Eureka Lake to Jamison Creek, about 1,700 feet. Downieville sheet.

Eureka Lake; Plumas County, eastern part of T. 22 N., R. 11 E.; 1 small inlet; outlet Eureka Creek to Jamison Creek (tributary through Middle Fork of Feather River to Feather River and thence to the Sacramento); elevation, 6,200 feet; fall of outlet, 1,800 feet. Downieville sheet.

Eureka Creek (R); rises in Sierra County, in the northwestern part of T. 20 N., R. 10 E., near Eureka, at altitude 5,000 feet above sea level; flows southward 2 miles, then eastward 1 mile into Goodyears Creek (tributary through North Fork of Yuba to Middle Fork of Yuba, and thus through Yuba and Feather rivers to the Sacramento); fall, 1,300 feet. Downieville sheet.

Fall Creek (L); rises in Butte County, in the northeastern part of T. 23 N., R. 4 E., at altitude 4,100 feet above sea level; flows irregularly westward into West Branch of Feather River (tributary through North Fork of Feather River to Feather River and the Sacramento); about 3 miles long; fall, 1,800 feet. Bidwell Bar and Chico sheets.

Fall Creek (R); rises in Nevada County, in the southern part of T. 18 N., R. 12 E., in Feeley Lakes, on the south slope of Fall Creek Mountain, at altitude 6,800 feet above sea level; flows southwestward 4½ miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 3,700 feet, of which 1,900 feet occurs in 1½ miles just above mouth. Colfax sheet.

Fall Creek (L); rises in Shasta County, in the southeastern part of T. 35 N., R. 4 W., at altitude 1,800 feet above sea level; flows northwestward 1½ miles into Salt Creek, which in turn flows into the Sacramento; fall, 700 feet. Redding sheet.

Fall River (L); Plumas County; rises in the southeastern part of T. 22 N., R. 8 E., at altitude 5,650 feet above sea level; flows southwestward about 10 miles, entering Butte County in the southeastern part of T. 21 N., R. 7 E., and then taking a circuitous but in general westerly course to its junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento) in the eastern part of T. 21 N., R. 6 E.; length, about 20 miles; fall, 4,650 feet. About 1 mile above its mouth Fall River leaps over a cliff perhaps 450 feet in height, forming a beautiful fall, below which is a series of cascades. Bidwell Bar folio (No. 43), Geol. Atlas U. S., U. S. Geol. Survey, 1898, p. 3.

Fall River (R); Shasta County; rises in the northeastern part of T. 37 N., R. 4 E., at altitude (approximate) 3,500 feet above sea level; flows very irregularly southeast-

ward about 12 miles to its junction with Pit River (tributary to Sacramento River) at Fall River Mills; fall about 200 feet; principal surface tributary, Bear Creek; the large springs at the head of the river discharge about 1,500 second feet. Modoc Lava Bed sheet.

Fandango Creek (L); rises in the northeastern part of Modoc County, on the western slope of Warner Mountains, at altitude 6,000 feet above sea level; flows northwestward about 13 miles into Goose Lake, which at exceptionally high stages may be tributary to the North Fork of Pit River and thus through Pit River to the Sacramento; fall, 1,200 feet. Alturas sheet.

Faucherie Lake; Nevada County, T. 18 N., on line between Rs. 12 and 13 E.; inlet Canyon Creek from French Lake and several unnamed streams; outlet Canyon Creek which flows through Bowman Lake to its junction with South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation above sea level, 6,050 feet; below French Lake, 500 feet, above Bowman Lake, 550 feet, this stretch of Canyon Creek being 3 miles long; dammed at outlet. Colfax sheet.

Feather River (R); heads on crest of Sierra Nevada, takes a general southwesterly course to junction with the Sacramento about 30 miles south of Marysville and 15 miles northwest of Sacramento. The river is formed by 3 principal branches, the North Fork draining about 2,220 square miles of the area at the north and west, the Middle Fork draining 1,340 square miles in the center and at the east, and Yuba River, draining about 1,300 square miles at the south.

The North Fork, which may be regarded as the continuation of the main stream, rises on the southern slope of Lassen Peak (elevation 10,437 feet), in the southeastern part of Shasta County, and flows southeastward about 32 miles to the lower end of Big Meadows where it turns and flows southwestward to its junction with Middle Fork, 4 miles west of Bidwell Bar. The stream is about 80 miles long. The total length of its basin does not exceed 75 miles and its width in Plumas County is about 65 miles. At the point where North Fork unites with Middle Fork the elevation is about 200 feet above sea level. For the greater part of its course the North Fork flows through a deep canyon and the tributaries are for the most part short streams draining precipitous slopes. Below the junction of the principal forks the Feather is about 100 miles long and the fall in this distance is about 180 feet.

The greater part of the Feather River basin is rough and mountainous and the slopes are deeply cut by innumerable stream channels. In the southern and eastern parts of the basin the rocks are chiefly granites; at the lower elevation some porous and deeply eroded tuffs and lavas are also found. The northern part of the basin is characterized by cones, craters, deposits of volcanic ash and lakes, which indicate recent volcanic activity.

The soil of the basin is porous, absorbs moisture readily, and serves to equalize the stream flow. The numerous meadows and valleys that exist in different parts of the area also help to maintain a steady flow of the streams during the dry season.

The basin is well forested. On the lower elevations the growth consists for the most part of brush and scrub timber. The mountain sides, especially around the summits of the highest peaks like Lassen are covered with merchantable timber. About two-thirds of the entire basin, 4,300 square miles in round numbers, is included in national forest reserves.

The mean annual precipitation in the Feather River basin is about 30 inches in foothill belt; toward the mountain summits it increases, ranging from 40 to 60 inches in the North and Middle fork basins and from 40 to 75 inches in the Yuba basin. In the winter much of it occurs as snow which remains on the summits until summer.

The basin affords many excellent storage sites, especially on the North and Middle forks. Surveys of a large number of reservoir sites in this area have been made by the United States Reclamation Service and many other sites have been surveyed by private companies.

The minimum flow of the streams in the Feather River basin is sufficient to develop more than half a million horsepower and this amount could be almost doubled with storage. On North Fork about 300,000 horsepower could be developed at low water, and with storage half a million would be available. On Middle Fork only about 66,000 horsepower could be developed at low water, and on Yuba River only about 130,000.

The basin contains many large springs, especially in the lava districts, which supply a more or less steady flow throughout the year. In the North Fork basin especially are perennial springs that discharge 50 to 100 second-feet. One of the largest, Dotta Spring, about 3 miles east of Prattville, has a maximum discharge of 100 second-feet and a minimum discharge of 70 second-feet.

Gaging stations: North Fork above Prattville and near Big Bend 1905–1909; main stream at Oroville 1902–1909.

Lassen Peak, Honey Lake, Bidwell Bar, Sierraville, Smartville, Colfax, and Sacramento sheets; maps of Plumas, Butte, Sierra, Nevada, and Yuba counties.

Feather River, Little North Fork (R); rises in Plumas County, in the eastern part of T. 23 N., R. 6 E., on the west slope of Grizzly Hill, at altitude 6,200 feet above sea level; flows south of west 2 miles, then very irregularly southward 10 miles to junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento) in Butte County, in the northeastern part of T. 21 N., R. 6 E.; fall, 4,500 feet; tributaries, Axford, Coquette, and Mountain House creeks. Bidwell Bar sheet.

Feather River, Middle Fork (L); rises on the western slope of the Sierra Nevada in the southeastern part of Plumas County and flows irregularly westward to its junction with the North Fork (tributary to the Sacramento).

The basin is long but comparatively narrow, except at its east end, where it broadens out and includes Sierra Valley, a large mountain meadow at an altitude 5,000 feet above sea level. Beckwith Pass, which opens into this valley from the east, is the lowest pass in the Sierra Nevada, its elevation being about 5,200 feet above sea level. Sierra Valley and the surrounding country are very dry in summer. A number of streams, of which the most important are Smithneck and Hamlin creeks, enter Sierra Valley from the south and west. The waters of the streams entering from the east have no surface connection with the Middle Fork of Feather River. Those from the west, including Hamlin Creek, discharge into a marsh which has outlet northward to the Middle Feather near Beckwith.

The greatest elevation in the Middle Fork basin is about 8,500 feet above sea level. The river is about 95 miles long and its drainage area comprises 1,340 square miles. Between Beckwith at the lower end of Sierra Valley and the junction of the Middle and North Forks the total fall is 4,700 feet.

The mean annual precipitation in the basin of the Middle Fork ranges from 40 to 60 inches; horsepower available at low water stage about 66,000.

Gaging station at Cromberg 1910–1911.

Sierraville, Downieville, and Bidwell Bar sheets.

Feather River, Middle Fork, South Branch (L); rises in Plumas County, in the eastern part of T. 22 N., R. 8 E., at altitude 5,700 feet above sea level; flows southwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 15 miles; fall, 4,000 feet, of which 1,500 feet occurs in 2 miles at mouth; drainage basin long, narrow, and very mountainous; tributaries all short, Pinkard and Cascade creeks, the most important, being less than 5 miles long. Bidwell Bar sheet.

Feather River, North Fork. See *Feather River.*

Feather River, North Fork, Little. See *Feather River, Little North Fork.*

Feather River, South Fork (L); rises in Plumas County, in the northwestern part of T. 22 N., R. 10 E., on the west slope of Pilot Peak, at altitude 6,500 feet above sea level; flows southwestward to its junction with Middle Fork Feather River (trib-

utary through Feather River to the Sacramento); length, about 40 miles; fall, 6,100 feet; drainage area very narrow; most of the tributaries less than a mile long. Downieville and Bidwell Bar sheets.

Feather River, West Branch (R); rises in Butte County, in the north-central part of T. 25 N., R. 5 E., at altitude 6,000 feet above sea level; flows northwestward 3 miles, then very irregularly southward to its junction with North Fork of Feather River (tributary through Feather River to the Sacramento) in the eastern part of T. 21 N., R. 4 E.; length, about 37 miles; fall, 5,500 feet; drainage basin comparatively narrow; most of the tributaries are short streams draining steep slopes. Lassen Peak and Chico sheets.

[Feather River] West Branch Creek, Little (R); rises in Butte County, in the southwestern part of T. 24 N., R. 4 E., at altitude 4,000 feet above sea level; flows southward into West Branch of Feather River (tributary to North Fork of Feather River and thus through Feather River to the Sacramento); length, 7 miles; fall, 2,200 feet; tributary Long Gulch Creek. Chico sheet.

Feeley Lakes; Nevada County, southern part of T. 18 N., R. 12 E.; 3 connected lakes; outlet, Fall Creek to South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation of lower lake, 6,700 feet; of middle lake, 6,800 feet; of the upper lake, about 6,900 feet. Colfax sheet.

Fiddle Creek (R); rises in Sierra County, in the southeastern part of T. 20 N., R. 9 E., at altitude 5,500 feet above sea level; takes a general southwesterly course to its junction with North Fork of Yuba River (tributary to Middle Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); length, 8 miles; fall, 3,200 feet. Downieville sheet.

Fiddler Creek (L); rises in Shasta County, in the northeastern part of T. 29 N., R. 8 W., about 1,400 feet above sea level; flows southeastward 3 miles into Middle Fork of Cottonwood Creek (tributary through Cottonwood Creek to the Sacramento); fall, about 700 feet. Red Bluff sheet.

Fish Creek (L); rises in Butte County, in the southwestern part of T. 25 N., R. 5 E., about 2 miles west of Table Mountain, at altitude 5,000 feet above sea level; flows southwestward 4 miles into West Branch of Feather River (tributary through North Fork of Feather River and Feather River to the Sacramento); fall, 1,900 feet. Bidwell Bar and Chico sheets.

Fishermans Lake; American Basin, Sacramento County; a northwestward extending arm of Bush Lake. This lake lies about 1 mile east of Sacramento. Davisville sheet.

Fiske Creek (R); rises in Yolo County, in the southern part of T. 12 N., R. 4 W.; flows northward 5 miles into Cache Creek (tributary to Yolo Basin); channel dry soon after the last rains of the season and remains dry until the next wet season. Punnett's map of Yolo County.

Fitzhugh Creek (R); rises in southeastern part of Modoc County, on western slope of Warner Mountains, 4 miles west of Warren Peak, at altitude 6,000 feet above sea level; flows westward about 12 miles into South Fork of Pit River (tributary through Pit River to the Sacramento); fall, approximate, 1,500 feet. Alturas sheet.

Five Lakes; Placer County, northwestern part of T. 15 N., R. 16 E.; outlet Five Lakes Creek to Rubicon River (tributary through Middle Fork of American River to North Fork American and thus through American River to the Sacramento); elevation, 7,500 feet; fall of outlet, 2,500 feet in 9 miles. The lakes are very small and are connected. Truckee sheet.

Five Lakes Creek (R); rises in Placer County in the northwestern part of T. 15 N., R. 16 E., in Five Lakes at altitude 7,500 feet above sea level; flows southwestward 9 miles into Rubicon River tributary to North Fork of American River and thus through American River to the Sacramento); fall, 2,500 feet. Truckee sheet.

Flat Creek (L); Shasta County, rises in the southwest part of T. 31 N., R. 5 W., at altitude 1,100 feet above sea level; flows east and then south, but water sinks before reaching Clear Creek (tributary to Sacramento River) to which the basin is topographically tributary; length, about 3 miles; fall, 300 feet; intermittent. Redding sheet.

Flat Creek (R); Shasta County; rises in the western part of T. 33 N., R. 6 W., at altitude 2,000 feet above sea level; flows southeastward into Sacramento River; fall, 1,400 feet; intermittent. Redding sheet.

Flat Creek (R); Shasta County; rises in the southern part of T. 35 N., R. 2 W., on the south slope of Brock Butte, at altitude 2,500 feet above sea level; flows southward 4½ miles into Pit River (tributary to Sacramento River); fall, 1,500 feet; intermittent in upper part of course. Land Office map; called Brock Creek on Redding sheet.

Flea Valley Creek (R); rises in Butte County, in the southeastern part of T. 24 N., R. 4 E., at altitude 3,500 feet above sea level; flows southeastward 3 miles to junction with North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,300 feet. Bidwell Bar sheet.

Ford Ravine Creek (R); rises in Placer County in the northwestern part of T. 15 N., R. 11 E., at altitude 4,000 feet above sea level; flows southeastward 1½ miles into North Fork of American River (tributary through American River to the Sacramento); fall, 2,500 feet. Colfax sheet.

Fordyce Creek (R); rises in Nevada County, in the southern part of T. 18 N., R. 13 E., in Fordyce Lake, at altitude 6,300 feet above sea level; flows southwestward into South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); length, 8 miles; fall, 1,600 feet; tributaries from a number of small lakes. Truckee and Colfax sheets.

Fordyce Lake; Nevada County, on boundary between Ts. 17 and 18 N., R. 13 E.; inlets North Creek and a number of small unnamed streams; outlet Fordyce Creek to South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); elevation, 6,300 feet; fall of outlet, 1,600 feet. Truckee sheet.

Frazer Creek (R); rises in Butte County, in the northwestern part of T. 21 N., R. 5 E., on the south slope of Big Bend Mountain, at altitude 2,500 feet above sea level; flows southeastward about 2 miles into North Fork of Feather River (tributary through Feather River to the Sacramento) opposite the mouth of Berry Creek; fall, 1,900 feet. Bidwell Bar sheet.

Frazier Creek (L); Plumas County; rises in Gold Lake, in the northwestern part of T. 21 N., R. 12 E., at altitude 6,300 feet above sea level; flows northeastward 6 miles into Middle Fork of Feather River (tributary through Feather River to the Sacramento) in Mohawk Valley; fall, about 1,900 feet. Downieville sheet.

Freeman Creek (R); rises in Plumas County in the northwestern part of T. 23 N., R. 13 E., at altitude 6,800 feet above sea level; takes a general northerly course into Grizzly Creek (tributary through Middle Fork of Feather River and Feather River to the Sacramento); about 5 miles long; fall, 1,000 feet. Downieville sheet.

French Creek (L); Butte County; rises in the southwestern part of T. 26 N., R. 6 E., at altitude 5,000 feet above sea level; flows very irregularly southwestward to junction with North Fork of Feather River (tributary through Feather River to the Sacramento) opposite the east base of Big Bend Mountain in the northern part of T. 21 N., R. 5 E.; length, about 10 miles; fall, 4,200 feet; many small tributaries, including Brush, Peavine, Rum, Bidwell, and Mosquito creeks. Bidwell Bar sheet.

French Creek (L); Glenn County; rises in the northern part of T. 20 N., R. 4 W.; flows southeastward through Stone Valley into the South Fork of Willows Creek (to Colusa Basin); intermittent. Sheet B, Sacramento Valley map.

French Creek (L); Shasta County; rises in the northwestern part of T. 32 N., R. 2 W., at altitude 1,000 feet above sea level; flows southwestward across Swede Creek plains into Little Cow Creek (tributary through Cow Creek to Sacramento River); length, about 7 miles; fall, 600 feet; intermittent. Redding sheet.

French Lake; Nevada County, western part of T. 18 N., R. 13 E., 1 mile west of Summit City; several small inflowing streams; outlet, Canyon Creek, which flows from Faucherie and Bowman lakes to its junction with South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation 6,550 feet above sea level; elevation above Faucherie Lake, 450 feet, the connecting stream being about a mile long; dammed at outlet. The lake is about 1½ miles long and at its upper end are several small islands. Colfax sheet.

Frenchman Creek (R); rises in Plumas County, in the southwestern part of T. 24 N., R. 15 E., at altitude 7,500 feet above sea level; flows eastward 7 miles to its junction with Last Chance Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); fall, 2,000 feet. Sierraville sheet.

Fresh Pond Ravine Creek (L); rises in Eldorado County, in the southern part of T. 11 N., R. 13 E., at altitude 4,000 feet above sea level; flows northwestward into South Fork of American River (tributary through American River to the Sacramento); length, 1 mile; fall, 1,400 feet. Placerville sheet.

Fresh Water Creek (R); rises in Colusa County, in the central part of T. 15 N., R. 5 W.; flows southeastward 4 miles, eastward 1 mile, northward 3 miles, then very irregularly northeastward into Powell Slough, Colusa Basin; intermittent. Sheet D, Sacramento Valley map.

Frey Creek (L); rises in Butte County, in the southwestern part of T. 21 N., R. 7 E., at altitude 4,200 feet above sea level; flows southwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento) one-half mile below mouth of Fall River; length, 5 miles; fall, 3,200 feet. Bidwell Bar sheet.

Fuller Lake; Nevada County, northwestern part of T. 17 N., R. 12 E.; outlet, Jordan Creek to South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation, 5,250 feet above sea level; fall of outlet, 750 feet. Colfax sheet.

Funk Creek (R); rises in Glenn County, in the southern part of T. 18 N., R. 5 W.; flows southeastward; discharges into Colusa Basin; intermittent. Sheet C, Sacramento Valley map.

Gaddis Creek (R); rises in Eldorado County, in the western part of T. 12 N., R. 12 E., at altitude 4,500 feet above sea level; flows southeastward about 3 miles into Slab Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 400 feet. Placerville sheet.

Gansers Slough Creek (R); rises in Plumas County, in the southeastern part of T. 24 N., R. 9 E. at altitude 5,500 feet above sea level; flows northward 2½ miles to Spanish Creek (tributary to Indian Creek and thence through North Fork of Feather River to Feather River and into the Sacramento); total fall 1,600 feet. Downieville sheet.

Gas Canyon Creek (R); rises in Placer County, in the northeastern part of T. 13 N., R. 9 E., at altitude 2,600 feet above sea level; flows westward 2 miles, then west of south 3 miles into Middle Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,750 feet. Placerville sheet.

Gent Creek (R); rises in Nevada County, in the central part of T. 16 N., R. 7 E., at altitude 1,900 feet above sea level; flows southwestward into Squirrel Creek (tributary through Feather River to the Sacramento); length 1 mile; fall, 400 feet. Smartsville sheet.

Georgiana Slough; Sacramento Basin, between Walnut Grove on old Sacramento River and Mokelumne. Sacramento Valley map.

Gerlé Creek (L); rises in Eldorado County, in the northeastern part of T. 13 N., R. 15 E., in Loon Lake at altitude 6,300 feet above sea level; flows westward 4 miles, then irregularly southward 5 miles into Little South Fork of Rubicon River (tributary to Middle Fork of American River and thus through American River to the Sacra-

mento); length, about 9 miles; fall, about 1,350 feet. Truckee and Pyramid Peak sheets.

Gibson Ravine Creek (L); rises in Butte County, in the southwestern part of T. 20 N., R. 7 E., at altitude 2,500 feet above sea level; flows northwestward 2 miles into South Fork of Feather River (tributary to Middle Fork of Feather and thus through Feather River to Sacramento River); fall, 1,100 feet. Bidwell Bar sheet.

Gilsizer Slough; Sutter Basin, extends southwestward into the basin from Feather River at Marysville. Gilsizer Slough sheet. See also Sacramento Valley map.

Glen Valley Slough; Colusa County, extending eastward about 10 miles from the southwestern part of T. 16 N., R. 4 W., into Colusa Basin, 4 miles west of Colusa. Sheet D, Sacramento Valley map.

Gold Canyon Creek (L); rises in Sierra County, in the southern part of T. 22 N., R. 10 E., at altitude 6,700 feet above sea level; flows northwestward 3 miles into East Branch of Slate Creek (tributary to North Fork of Yuba River which flows to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 1,500 feet. Downieville sheet.

Gold Lake; Plumas County, western part of T. 24 N., R. 8 E., northwest of Spanish Creek; three small inlets; outlet, a stream 1 mile long, flowing northeastward to Silver Creek (tributary to Indian Creek and thence through North Fork of Feather River to Feather River and into the Sacramento); elevation, about 6,150 feet. Bidwell Bar sheet.

Gold Lake; Sierra County, northwestern part of T. 21 N., R. 12 E.; inlets from several small lakes; outlet, Frazier Creek to Middle Fork of Feather River (tributary through Feather River to the Sacramento); elevation, 6,300 feet. This lake is about 1 mile long and one-half mile in maximum width. Downieville sheet.

Goodyears Creek (R); rises in Sierra County, in the southern part of T. 21 N., R. 10 E., on the south slope of Saddleback Mountain, at altitude 6,000 feet above sea level; flows southward into North Fork of Yuba River (tributary through Middle Fork of Yuba to Yuba River, and thus through Feather River to the Sacramento); length, 7 miles; fall, 3,400 feet; tributary, Eureka Creek; gaging station at Goodyears Bar, 1910–11. Downieville sheet.

Goose Lake; Butte County, three-fourths mile west of Soto Lake; an intermittent water body, probably fed by high stages of Pine Creek and disappearing by evaporation; elevation, about 180 feet. Vina sheet.

Goose Lake; northern part of Modoc County, Cal., and southern part of Lake County, Oreg., about two-thirds of the lake being in California but by far the greater portion of the valley being in Oregon; elevation, about 4,800 feet above sea level; length, 28 miles; maximum width, 10 miles; inlets, 16 streams in California with an aggregate drainage area of about 250 square miles, and 6 streams in Oregon; aggregate discharge of all the streams estimated at 60,000 acre-feet annually; maximum depth, not more than 20 feet; water alkaline; annual rainfall on open surface of lake estimated at 14 inches; probably receives a large supply of water from subsurface springs.

It is said that in the early sixties an emigrant trail crossed the valley of the creek at a place where the water is now several feet deep, but a few years later the lake rose so as to extend several miles farther north than it now extends and for a short time in 1869 it overflowed southward to the North Fork of Pit River. In 1881 it is reported to have overflowed to Pit River for more than 2 hours during a severe storm from the north.

Surveys and data: Alturas sheet; Russell, I. C., A geological reconnaissance in southern Oregon: Fourth Ann. Rept. U. S. Geol. Survey, 1884, pp. 456–457; Waring, G. A., Geology and water resources of a portion of south-central Oregon: Water-Supply Paper U. S. Geol. Survey No. 220, 1908, pp. 10, 12, 39, 42–43, 50–51.

Granite Canyon Creek (L); rises in Eldorado County, the southern part of T. 11 N., R. 10 E., at altitude 1,300 feet above sea level; flows west 1 mile, then north 1½ miles into South Fork of American River (tributary through American River to Sacramento River) at Lotus; fall, 600 feet. Placerville sheet.

Granite Creek (R); rises in Placer County, in the northwestern part of T. 16 N., R. 14 E., in small lakes on the west slope of Devils Peak (altitude 7,700 feet); flows southwestward into North Fork of American River (tributary to Sacramento River); fall, about 3,000 feet. Truckee and Colfax sheets.

Granite Creek, Little (R); rises in Placer County, in the northern part of T. 16 N., R. 13 E., at altitude 6,700 feet above sea level; flows southwestward 3 miles, then southward one-half mile into Granite Creek (tributary through North Fork of American to American River and thus to the Sacramento); fall, 3,000 feet. Colfax sheet.

Grass Lake; Plumas County, southeastern part of T. 22 N., R. 11 E.; inlet Little Jamison Creek, which flows through the lake to its junction with Jamison Creek (tributary to Middle Fork of Feather River and thence through Feather River to the Sacramento); elevation, 5,850 feet above sea level; fall of Little Jamison Creek between Grass Lake and Jamison Creek, 550 feet. Downieville sheet.

Gray Eagle Creek (L); rises in Plumas County, in Long Lake, in the northwestern part of T. 21 N., R. 12 E., at altitude 6,700 feet above sea level; flows northeast through Gray Eagle Valley to its junction with the Middle Fork of Feather River in Mohawk Valley; length, about 6 miles; fall, 2,200 feet. Downieville sheet.

Greenhorn Creek, Little (R); rises in Nevada County in the southeastern part of T. 16 N., R. 9 E., at altitude 3,000 feet above sea level; flows southeastward into Greenhorn River (tributary to Bear River and thus through Feather River to the Sacramento); length, 5 miles; fall, 600 feet. Colfax sheet.

Greenhorn River (R); rises in Nevada County, in the northern part of T. 16 N., R. 10 E., 2 miles west of Remington, at altitude 4,500 feet above sea level; flows southwestward into Bear River (tributary through Feather River to the Sacramento); length about 13 miles; fall, 2,500 feet. Colfax sheet.

Greens Creek (L); rises in Shasta County, in the northwestern part of T. 34 N., R. 3 W., on western slope of Town Mountain, at altitude 2,500 feet above sea level; flows irregularly westward into McCloud River (tributary through Pit River to the Sacramento); length, 2½ miles; fall, 1,650 feet. Redding sheet.

Greens Lake; Yolo Basin, 5 miles south of west of Sacramento and 2 miles west of Washington Lake; a water body about 1 mile long, mapped as permanent on the Sacramento Valley map, sheet L.

Green Spring Creek (R); rises in Eldorado County, in the southwestern part of T. 10 N., R.9 E., at altitude 1,200 feet above sea level; flows northwestward 2½ miles, then south of west 1½ miles into New York Creek (tributary through South Fork of American River to American River and the Sacramento); fall, 600 feet. Sacramento sheet.

Greenwood Creek (R); rises in Eldorado County in the northwestern part of T. 12 N., R. 10 E., 2½ miles northeast of Greenwood, at altitude 2,500 feet above sea level; takes a very irregular but in general southwesterly course to its junction with South Fork of American River (tributary through American River to the Sacramento); one-half mile south of Magnolia; length, 10 miles; fall, 1,800 feet; several tributaries, one of which, Lichen Creek, is named on the map. Placerville sheet.

Grindstone Creek (L); Glenn County; rises on the eastern slope of the Coast Range in Tehama County, near the center of T. 23 N., R. 10 W.; takes a general southeasterly course to junction with Stony Creek (tributary to Sacramento River) in T. 21 N., R. 6 W.; drainage area, mountainous; length, about 30 miles; many branching tributaries. Punnett's map of Glenn and Colusa counties.

Grindstone Creek, South Fork (R); rises in Glenn County, in the western part of T. 21 N., R. 8 W., on the eastern slope of the Coast Range; flows eastward 3 miles, then northeastward 4 miles, to junction with Grindstone Creek (tributary through Stony Creek to Sacramento River). Punnett's map of Glenn and Colusa counties.

Grizzly Canyon Creek (R); rises in Eldorado County, in the northwestern part of T. 13 N., R. 11 E., at altitude 3,100 feet above sea level, near Volcanoville; flows south-

eastward 1 mile into Missouri Canyon Creek (tributary through Otter Creek to Middle Fork of American River and thus through North Fork of American and American rivers to the Sacramento); fall, 500 feet. Placerville sheet.

Grizzly Canyon Creek (R); rises in Placer County, in the southeastern part of T. 15 N., R. 10 E., at altitude 3,200 feet above sea level; flows southwestward 2½ miles into Shirttail Canyon Creek (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,300 feet. Colfax sheet.

Grizzly Canyon Creek, Little (L); rises in Placer County, in the southwestern part of T. 13 N., R. 13 E., at altitude 4,800 feet above sea level; flows westward 1½ miles into Grizzly Creek (tributary through Rubicon River to Middle Fork of American and thus through North Fork of American to American River and the Sacramento); fall, 1,300 feet. Placerville sheet.

Grizzly Creek (L); Nevada County; rises 2 miles northwest of Columbia Hill, at altitude 3,600 feet above sea level; flows southwestward into Middle Fork of Yuba River (tributary to Yuba River and thus to Feather River and the Sacramento); length, 5 miles; fall, 1,800 feet. Colfax sheet.

Grizzly Creek (R); Placer County; rises in the northeastern part of T. 13 N., R. 13 E., at altitude 5,200 feet above sea level; flows southwestward 7 miles into Rubicon River (tributary to Middle Fork of American and thus through North Fork of American and American rivers to the Sacramento); fall, 2,700 feet. Placerville sheet.

Grizzly Creek (L); Plumas County; rises near the center of T. 23 N., R. 7 E., on the northern slope of Grizzly Hill (altitude, 6,424 feet); flows north, northwest, and southwest, and enters North Fork of Feather River (tributary through Feather River to the Sacramento) from the west in the northeastern part of T. 23 N., R. 5 E.; length, 12 miles; fall, 4,000 feet; flows throughout in a deep canyon. Bidwell Bar sheet.

Grizzly Creek (R); Plumas County; rises in the west-central part of T. 24 N., R. 12 E., at altitude 6,000 feet above sea level; flows eastward 6 miles, then southeastward 10 miles to its junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento) near Kerby; fall, about 1,200 feet. In its upper course this creek flows through a comparatively open meadow called Grizzly Valley. Sierraville and Downieville sheets.

Grizzly Creek (L); Sierra County; rises in the northwestern part of T. 18 N., R. 9 E., at altitude 3,500 feet above sea level; flows southwestward 2 miles, then northwestward 4 miles into Oregon Creek (tributary to Middle Fork of Yuba River and thus through Yuba River to Feather River and the Sacramento); fall, 1,300 feet. Colfax and Smartsville sheets.

Grizzly Creek, Little (L); Plumas County; rises in the northeastern part of T. 24 N., R. 12 E., 2 miles south of Mount Ingalls, at altitude 6,800 feet above sea level; flows somewhat south of west about 3 miles, then northwestward 11 miles to junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento) 1 mile west of Genesee; total fall, 3,300 feet; drains northeastern slope of Grizzly Mountains. Sierraville sheet and Indian Valley special map.

Grizzly Gulch Creek (L); rises in Shasta County, in the western part of T. 33 N., R. 6 W., at altitude 2,800 feet above sea level; flows southward 4 miles into Clear Creek (tributary to Sacramento River); fall, 1,700 feet. Red Bluff sheet.

Grizzly Hollow Creek (L); rises in Butte County, in the southwestern part of T. 23 N., R. 2 E., at altitude about 700 feet above sea level; flows southwestward 4 miles into Sheep Hollow Creek (tributary through Sycamore Creek to Mud Creek, and thus through Big Chico Creek to the Sacramento); fall, about 450 feet. Chico sheet.

Grouse Creek (L); rises in Placer County, in the southeastern part of T. 15 N., R. 13 E., at altitude 5,400 feet above sea level; flows north of west 2½ miles, then southwestward 3½ miles into North Fork of Middle Fork of American River (tributary

through Middle Fork of American to North Fork of American and thus through American River to the Sacramento); fall, 3,000 feet, of which 900 feet occurs in 1 mile just above the mouth. Colfax sheet.

Hamilton Branch (R); rises in southwestern part of Lassen County in the southern part of T. 28 N., R. 10 E. (altitude 6,000 feet above sea level); flows westward about 12 miles through mountain meadows, then turns and flows southward about 6 miles through the lower end of Big Meadows to its junction with North Fork of Feather River (tributary through Feather River to the Sacramento) 3 miles west of Prattville, Plumas County. This basin ranges in elevation from 4,300 to 7,500 feet; drainage area of Hamilton Branch, 230 square miles; fall, about 1,500 feet. Gaging station near Prattville 1905–1907. Honey Lake and Lassen Peak sheets.

Hamilton Slough; southern part of Butte County, in Butte Basin, between Feather River and Dry Creek, just south of Biggs; carries overflow water from Feather River into Butte Basin. Marysville sheet.

Hamlin Creek (L); rises in Sierra County, in the northwestern part of T. 19 N., R. 14 E., at altitude 6,500 feet above sea level; flows northward 8 miles, and discharges into the marsh at the west side of Sierra Valley on Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall above marsh, 1,600 feet, of which 1,000 feet occurs in the first mile at head of stream. Sierraville sheet.

Hampshire Creek (R); rises in Yuba County, in the northeastern part of T. 19 N., R. 7 E., near Clipper Mills, at altitude 3,500 feet above sea level; flows south of east 2 miles into North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 1,500 feet. Bidwell Bar sheet.

Hangtown Creek (R); rises in Eldorado County, in the northern part of T. 10 N., R. 11 E., 2 miles east of Placerville, at altitude 2,300 feet above sea level; flows somewhat north of west about 6 miles into Webber Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 1,000 feet. Placerville sheet.

Haskell Creek (R); rises in Sierra County, in the southwestern part of T. 21 N., R. 13 E., on the west slope of Haskell Peak, at altitude 7,300 feet above sea level; flows southward 2 miles into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); fall, 1,600 feet. Downieville sheet.

Hass Slough; Yolo Basin; an outlet channel extending northwestward from Cache Slough. Sheet P, Sacramento Valley map.

Hastings Creek (R); rises in Eldorado County, in the central part of T. 12 N., R. 9 E., at altitude 1,700 feet above sea level; flows southward into South Fork of American River (tributary through American River to the Sacramento) 1 mile west of the mouth of Greenwood Creek; length, 6 miles; fall, 900 feet. Placerville sheet.

Hatchet Creek (L); rises in Shasta County, in the east-central part of T. 35 N., R. 1 E., at altitude 3,800 feet above sea level; flows westward about 8 miles to junction with Pit River (through which it is tributary to Sacramento River); fall, 2,500 feet. Lassen Peak sheet.

Hat Creek (L); rises in the southeastern part of Shasta County, in a small lake on the northeast slope of Lassen Peak, at altitude (approximate) 7,300 feet; takes a general northerly course to its junction with Pit River (tributary to Sacramento River) 1 mile northwest of Carbon; length, about 38 miles; fall, 4,600 feet, of which 2,700 feet occurs in the first 8 miles of its course; principal tributary, Lost Creek; fed largely by springs issuing from the northern slope of Lassen Peak; minimum flow, several hundred second-feet; estimated horsepower available, 100,000. Gaging station at Hat Creek, 1910–11. Lassen Peak sheet.

Hawkins Canyon Creek (R); rises in Nevada County, in the northwestern part of T. 15 N., R. 10 E., near You Bet, at altitude 3,000 feet above sea level; flows southeastward 1 mile into Steep Hollow Creek (tributary through Bear River to Feather River and thus to the Sacramento); fall, 500 feet. Colfax sheet.

Hawley, Lake; Sierra County, eastern part of T. 21 N., R. 11 E.; outlet, East Fork of North Fork of Yuba River to North Fork of North Fork of Yuba River (tributary through North Fork of Yuba to Middle Fork of Yuba, and thus through Yuba River to Feather River and the Sacramento), Downieville branch; elevation, 6,700 feet. Downieville sheet.

Hayes Hollow Creek (L); rises in Glenn County, in the western part of T. 20 N., R. 4 W.; flows southeastward into the South Fork of Willows Creek (to Colusa Basin); intermittent. Sheet B, Sacramento Valley Creek.

Hazel Creek (L); rises in Shasta County, in the northwestern part of T. 37 N., R. 3 W., and the northeastern part of T. 37 N., R. 4 W.; flows irregularly westward to its junction with Sacramento River near Sims station; length, about 6 miles; approximate fall, 1,000 feet. Shasta sheet.

Hibbard Gulch Creek (L); rises in Tehama County, in the southwestern part of T. 26 N., R. 1 W., at altitude 700 feet above sea level; flows northwestward 2 miles into Little Wildcat Creek (tributary through Wildcat Creek to Rio de los Berrendos and thus through Antelope Creek to the Sacramento); intermittent; fall, 350 feet. Tehama sheet.

High Rock Ravine Creek (R); rises in Butte County 1 mile east of Oregon City, in T. 20 N., R. 4 E., at altitude 1,200 feet above sea level; flows southeastward 3 miles, then east of north 1 mile into North Fork of Feather River 1 mile above junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall, 900 feet. Chico and Bidwell Bar sheets.

Hinchman Ravine Creek (R); rises in Plumas County, in southwestern part of T. 26 N., R. 11 E., at altitude 5,500 feet above sea level; flows somewhat west of south 2½ miles into Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 1,900 feet. Indian Valley special map.

Hirz Creek (R); rises in Shasta County, in the southeastern part of T. 35 N., R. 4 W., at altitude 1,500 feet above sea level; flows eastward 1½ miles, then southeastward 1½ miles to junction with McCloud River (tributary through Pit River to the Sacramento); fall, 600 feet. Redding sheet.

Hoboken Creek (R); rises in Eldorado County, in the southwestern part of T. 13 N., R. 10 E., 1 mile southeast of Spanish Diggings, at altitude 2,300 feet above sea level; flows westward 2 miles into American Canyon Creek (tributary to Middle Fork of American River and thus through North Fork of American and American rivers to the Sacramento); fall, 1,300 feet. Placerville sheet.

Hog Canyon Creek (L); rises in Sierra County, in the eastern part of T. 20 N., R. 11 E., at altitude 6,700 feet above sea level; flows westerly to junction with East Fork of North Fork of Yuba River (tributary through North Fork of North Fork of Yuba, Downieville branch, to North Fork of Yuba, and thus through Middle Fork of Yuba and Yuba rivers to Feather River and the Sacramento); length, 4 miles; fall, 2,700 feet. Downieville sheet.

Hog Gulch Creek (L); rises in Tehama County, in the southeastern part of T. 27 N., R. 2 W., at altitude 1,200 feet above sea level; flows southwestward 4½ miles into Antelope Creek (tributary to Sacramento River) in Rio de los Berrendos Rancho; intermittent; fall, 950 feet, of which 920 feet occurs in upper 3 miles of course. Tehama sheet.

Hoghollow Creek (R); rises in Lake County, in the southern part of T. 14 N., R. 7 W.; flows eastward about 3 miles into North Fork of Cache Creek (tributary through Cache Creek to Yolo Basin). Punnett's map of Lake County.

Hog Lake; Sutter Basin, Sutter County, 3 miles east of the river; a permanent lake on the edge of the basin. Dunnigan sheet.

Honcut Creek (R); Butte County; formed by the union of North and South branches. North Honcut Creek, which drains the larger area and may therefore be considered the continuation of the main stream, rises in the central part of T. 19 N., R. 5 E., near Hurlton, at altitude 1,500 feet above sea level; flows northwestward 3 miles, then turns abruptly and takes a general southwesterly course to its junction with Feather River (tributary to Sacramento River) 10 miles north of Marysville; length, including major windings, about 25 miles; total fall, a little more than 1,400 feet, of which 500 feet occurs in the first 2 miles, 500 feet in the next 7 miles, and 400 feet in the succeeding 7 miles; fall in the remaining 9 miles almost inappreciable. Principal tributaries, Rocky Honcut and Wyandotte creeks, which flow into North Honcut; and Natchez Honcut, Date, and Prairie creeks, which join the South Honcut. The South Honcut forms part of the boundary between Butte and Yuba counties. Smartsville and Marysville sheets.

Honcut Creek, Natchez (R); rises in Butte County, in the western part of T. 19 N., R. 6 E., at altitude 2,500 feet above sea level; flows southward into South Honcut Creek (tributary through Honcut Creek to Feather River and thus to the Sacramento); fall, 1,300 feet. Smartsville sheet.

Honcut Creek, Rocky (L); rises in Butte County, in the southeastern part of T. 19 N., R. 5 E., 1 mile south of Hurleton, at altitude 1,900 feet above sea level; flows irregularly southwestward to its junction with North Honcut Creek (tributary through Honcut Creek to Feather River and thus to the Sacramento); length, about 6 miles; fall, 1,300 feet. Smartsville sheet.

Honcut Creek, South (L); rises in Yuba County, in the northern part of T. 19 N., R. 6 E., 1½ miles northwest of Brownsville, at altitude 2,500 feet above sea level; flows southwestward to its junction with North Honcut Creek (tributary through Honcut Creek to Feather River and thus to the Sacramento) in T. 17 N., R. 3 E.; length, 24 miles; fall, 2,400 feet, of which 1,000 feet occurs in the first 2 miles at the head and 1,000 feet more in the next 8 miles; forms boundary between Butte and Yuba counties; principal tributaries, Natchez Honcut, Date, and Prairie creeks. Smartsville and Marysville sheets.

Honey Run (L); rises in Butte County, near the center of T. 22 N., R. 3 E., 1 mile northwest of Paradise, at altitude 1,900 feet above sea level; flows southwest 1 mile then west 2½ miles into Little Butte Creek (tributary through Butte Creek to Butte Basin); fall, 1,300 feet. Chico sheet.

Hooker Creek (R); rises in Tehama County, in the southern part of T. 28 N., R. 5 W., at altitude 700 feet above sea level; flows northeastward 5 miles, then northward 6 miles to junction with Cottonwood Creek (tributary to Sacramento River); fall, about 300 feet. Red Bluff sheet.

Hooper Creek (L); rises in Tehama County, in T. 28 N., R. 1 W., at altitude 1,250 feet above sea level; flows westward 4½ miles into Salt Creek (tributary to Sacramento River); fall, 580 feet; intermittent. Tehama sheet.

Hopkins Creek (R); rises in Plumas County near the center of T. 22 N., R. 10 E., on the south slope of Bald Peak, at altitude 7,000 feet above sea level; flows northeastward into Poorman Creek (tributary through Nelson Creek to Middle Fork of Feather River and thus through Feather River to the Sacramento); length, 3 miles; fall, 2,000 feet. Downieville sheet.

Hopkins Slough; Colusa Basin; extends from a point 3 miles northwest of Colusa southward to Powell Slough. Sheet D, Sacramento Valley map.

Horse Creek (L); Lassen County. See *Coyote Creek.*

Horse Creek (R); Shasta County; rises in the western part of T. 34 N., R. 3 W., on the northeast slope of Horse Mountain, 2,000 feet above sea level; flows southeastward 3½ miles into Squaw Creek (tributary to Pit River and thus to the Sacramento) 1 mile above Copper City; fall, about 1,200 feet. Redding sheet.

Horseshoe Lake; Sutter Basin, Sutter County, one-eighth mile east of Sacramento River and one-fourth mile south of Collins Eddy. Dunnigan sheet.

Horseshoe Lake; Sutter Basin, Sutter County; one-half mile east of Sacramento River, 3 miles southeast of Knights Landing. Knights Landing sheet.

Hosselkus Creek (R); rises in Plumas County, in northeastern part of T. 26 N., R. 11 E., on south slope of Kettle Rock (altitude 7,500 feet above sea level); flows somewhat west of south about 9 miles to a junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento) at lower end of Genesee Valley. Total fall, 3,400 feet. Indian Valley special map.

Houghs Creek (L); rises in Plumas County in the northern part of T. 25 N., R. 10 E. (altitude 5,000 feet above sea level); flows northwestward 4 miles to junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); one-half mile south of Crescent Mills; fall, 1,500 feet. Indian Valley special map.

Howard Creek (R); rises in Sierra County in the southeastern part of T. 21 N., R. 12 E., at altitude 7,100 feet above sea level; flows irregularly southward into North Fork of North Fork of Yuba River (Sierra City branch; tributary through North Fork of Yuba River to Yuba River and thus through Feather River and the Sacramento); length, 5 miles; fall, 1,400 feet. Downieville sheet.

Hulen Creek (L); rises in Shasta County, in the northwestern part of T. 30 N., R. 6 W., at altitude 1,400 feet; flows in a general southerly direction about 5 miles into the North Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River); fall, 700 feet. Red Bluff sheet.

Humbug Creek (R); Nevada County; rises in the central part of T. 18 N., R. 10 E., at altitude 4,700 feet above sea level; flows southwestward 7 miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 2,500 feet. Colfax sheet.

Humbug Creek (L); Placer County; rises in the northwestern part of T. 15 N., R. 12 E., at altitude 5,200 feet above sea level; flows southwestward 2 miles, then northwestward 2½ miles into North Fork of American River (tributary through American River to the Sacramento) at Humbug Bar; fall, 3,000 feet. Colfax sheet.

Humbug Creek (R); Plumas County; rises near the center of T. 23 N., R. 13 E., on eastern slope of Grizzly Peak at altitude 6,000 feet above sea level; flows southward into Middle Fork of Feather River (tributary through Feather River to the Sacramento) which it enters at the lower end of Humbug Valley; length, about 5 miles; fall, 1,700 feet, of which 1,500 feet occurs in 1½ miles at head. Downieville sheet.

Humbug Creek (L); Sierra County; rises in the east-central part of T. 19 N., R. 9 E., at altitude 4,500 feet above sea level; flows westward 3 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); fall, 2,100 feet; tributary, Little Humbug Creek. Downieville sheet.

Humbug Creek, Little (L); rises in Sierra County, in the central part of T. 19 N., R. 9 E., at altitude 4,700 feet above sea level; flows west 2 miles, then north 1 mile into Humbug Creek (tributary to North Fork of Yuba River which flows through Middle Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); fall, 1,500 feet. Downieville sheet.

Hungry Creek (R); rises in Plumas County, in Taylor Lake, in the southern part of T. 27 N., R. 11 E., at altitude 6,850 feet above sea level; flows somewhat north of east 2 miles, thence southeastward 4½ miles to junction with Indian Creek (tributary to North Fork of Feather River and thus through Feather River to the Sacramento); fall, about 2,400 feet. Indian Valley special map.

Hunters Creek (R); Eldorado County; rises in the eastern part of T. 12 N., R. 13 E., at altitude 5,500 feet above sea level; flows southeastward 2 miles into Silver Creek (tributary through Silver Fork to South fork of American River and thus through American River to the Sacramento); fall, 900 feet. Pyramid Peak sheet.

Hunters Creek (R); Glenn County; rises in T. 18 N., R. 5 W.; flows east and southeast, and discharges into Colusa Basin south of Logans Creek; intermittent. Sheet C, Sacramento Valley map.

Hunters Creek (R); Plumas County; rises near the center of T. 22 N., R. 7 E., at altitude 5,200 feet above sea level; flows southeastward into Middle Fork of Feather River (tributary through Feather River to the Sacramento); 2 miles long; fall, 3,100 feet. Bidwell Bar sheet.

Hutchinson Creek (L); rises in Yuba County in the northwestern part of T. 15 N., R. 6 E., at altitude about 300 feet above sea level; takes a general southwesterly course to its junction with Reeds Creek (tributary to Plumas Lake), east of Feather River; about 12 miles long; fall, 200 feet. Wheatland and Ostrom sheets.

Inconstance Creek; rises in Siskiyou County, on the north slope of Mount Shasta, at altitude 9,000 feet above sea level; flows northward about 4 miles, and then sinks into the lava beds through which its water percolates southward, joining the underground drainage tributary through springs to McCloud River (tributary to Pit River and thus to the Sacramento). Shasta sheet.

Indiana Creek (L); rises in Yuba County in the northeastern part of T. 18 N., R. 7 E., on the western slope of Oregon Hills, at altitude 2,500 feet above sea level; flows southward 2 miles then northwestward 1½ miles into Dry Creek (tributary through Yuba River to Feather River and thus to the Sacramento); fall, 950 feet. Smartsville sheet.

Indian Creek (R); Colusa County; rises in the northwestern part of T. 16 N., R. 6 W.; flows eastward 3 miles, then nearly north 7 miles to junction with Little Stony Creek (tributary through Stony Creek to Sacramento River) near Zachary. Punnett's map of Glenn and Colusa counties.

Indian Creek (L); Eldorado County; rises in the east-central part of T. 10 N., R. 10 E., 2½ miles southwest of Placerville at altitude 1,600 feet above sea level; flows somewhat north of west 5 miles into Webber Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 600 feet. Placerville sheet.

Indian Creek (L); Placer County; rises in the northern part of T. 15 N., R. 12 E., at altitude 5,300 feet above sea level; flows somewhat west of south about 9 miles into Eldorado Creek (tributary to North Fork of Middle Fork of American River, which flows to Middle Fork of American River and thus through American River to the Sacramento); fall, 3,100 feet. Colfax sheet.

Indian Creek (L); Placer County; rises in the southern part of T. 15 N., R. 10 E., at altitude 4,000 feet above sea level; flows southeastward 8 miles into North Fork of American River (tributary through American River to the Sacramento) 3½ miles southeast of Colfax; fall, 2,900 feet, of which 1,000 feet occurs in about 2 miles just above the mouth. Colfax sheet.

Indian Creek (L); rises in Plumas County, in the northeastern part of T. 28 N., R. 11 E., on south slope of Diamond Mountain at altitude 6,300 feet above sea level; flows southward about 16 miles to the west end of Genesee Valley, thence very irregularly westward about 36 miles to its junction with the North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 4,000 feet.

Indian Valley, through which this creek flows, is the best tract of farming land in Plumas County. A reservoir site was surveyed for the Reclamation Service in August and September, 1905. Gaging station at Crescent Mills 1905–1909. Drainage area, 733 square miles; estimated run-off from drainage area, 600,000 acre-feet.[1]

Indian Valley special map, Honey Lake and Lassen Peak sheets.

Indian Creek (L); Shasta County; rises in the northwestern part of T. 35 N., R. 4 W., at altitude 2,500 feet above sea level; flows southwestward 1 mile, then westward 1 mile into Sacramento River; fall, 1,500 feet. Redding sheet.

[1] Fourth Annual Report of the Reclamation Service 1904–1905, Washington 1906, page 93.

Indian Creek (R); Sierra County; rises in the northeastern part of T. 18 N., R. 9 E., at altitude 4,300 feet above sea level; flows southwestward into Middle Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); length, 5 miles; fall, 2,100 feet. Colfax sheet.

Indian Creek, Little (R); rises in Colusa County, in the southern part of T. 16 N., R. 6 W.; flows northward about 5 miles into Indian Creek (tributary to Little Stony Creek and thus through Stony Creek to the Sacramento). Punnett's map of Glenn and Colusa counties.

Indian Spring Creek (R); rises in Nevada County in the northwestern part of T. 15 N., R. 7 E., at altitude 1,700 feet above sea level, on the northeast slope of Indian Springs Hill (altitude 2,231 feet); encircles the north base of the hill and then flows southward to its junction with Dry Creek (tributary through Feather River to the Sacramento) at the north foot of Iron Mountain; length, 7 miles; fall, 1,000 feet. Smartsville sheet.

Inks Creek (L); rises in Tehama County, in the eastern part of T. 29 N., R. 2 W., at altitude 800 feet above sea level; flows southwestward about 6 miles into Sacramento River 2 miles below Jellys Ferry; fall, about 400 feet. Red Bluff sheet.

Inskip Creek (L); rises in Butte County, in the central part of T. 25 N., R. 4 E., at altitude 4,900 feet above sea level; flows south of west about 3 miles into East Fork of Butte Creek (tributary through Butte Creek to Butte Basin); fall, 2,000 feet. Chico sheet.

Iowa Canyon Creek (L); rises in Eldorado County, in the southwestern part of T. 11 N., R. 12 E., at altitude 3,700 feet above sea level; flows north of west 6 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 2,000 feet. Placerville sheet.

Iowa Canyon Creek, Little (L); rises in Eldorado County in the southern part of T. 11 N., R. 12 E., at altitude 3,700 feet above sea level; flows northwestward 3 miles into Iowa Canyon Creek (tributary through South Fork of American River to American River and thus through American River to the Sacramento); fall, 1,200 feet. Placerville sheet.

Irish Creek (R); rises in Eldorado County, near Garden Valley, where it is formed by the junction of Manhattan and Empire creeks; flows southeastward 2 miles, then southwestward 2 miles into South Fork American River (tributary through American River to the Sacramento); fall below forks, 1,100 feet; tributaries, Dutch and Johntown creeks. Placerville sheet.

Island Lake; Nevada County, southern part of T. 18 N., R. 12 E.; outlet, South Fork Canyon Creek to Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); elevation, 6,900 feet above sea level; fall of outlet, 1,000 feet. Colfax sheet.

Jack Creek (R); rises in Butte County, in the northern part of T. 21 N., R. 5 E., at altitude 2,300 feet above sea level; flows southeastward into French Creek (tributary through North Fork of Feather River and Feather River to the Sacramento); less than a mile long; fall, 600 feet. Bidwell Bar sheet.

Jackson Creek (R); rises in Plumas County, in the east central part of T. 23 N., R. 12 E., at altitude 6,900 feet above sea level; flows westward 5½ miles to junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento) near Cromberg; fall, 2,500 feet; tributary, Cogswell Creek. Downieville sheet.

Jackson Creek (R); rises in Nevada County, in the southeastern part of T. 19 N., R. 13 E., in Jackson Lake, at altitude 6,650 feet above sea level; flows north of west 1 mile then southwestward 1¼ miles into Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento) three-fourths mile above the head of Bowman Lake; fall, 1,000 feet. Colfax sheet.

Jackson Lake; Nevada County, southwestern part of T. 19 N., R. 13 E., on northwest slope of Long Mountain; outlet Jackson Creek to Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); altitude, 6,650 feet; fall of outlet, 1,000 feet. Colfax sheet.

Jackson Slough; Sacramento County, extending southward from old Sacramento River at Isleton to Sevenmile Slough, between Sacramento and San Joaquin rivers. Sacramento Valley map.

Jacobs Creek (L); rises in Eldorado County in the eastern part of T. 11 N., R. 9 E., at altitude 1,500 feet above sea level; flows northwest 1 mile, north 1 mile, then east 1 mile into South Fork of American River (tributary through American River to the Sacramento); fall, 800 feet. Placerville sheet.

Jamison Creek; rises in Plumas County, in the southern part of T. 22 N., R. 11 E., at altitude 7,000 feet above sea level; takes a general northeasterly course to its junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento) in the southwestern part of T. 23 N., R. 12 E.; length, 10 miles; fall, 2,700 feet; principal tributaries, Little Jamison, Eureka, and Squirrel creeks. Downieville sheet.

Jamison Creek, Little (R); rises in Plumas County, in Jamison Lakes in the northeastern part of T. 21 N., R. 11 E., at altitude 6,350 feet above sea level; flows northward 3 miles into Jamison Creek (tributary through Middle Fork of Feather River and Feather River to the Sacramento); fall, about 1,000 feet. Downieville sheet.

Jamison Lakes (two); Plumas County, northeastern part of T. 21 N., R. 11 E.; one inlet; outlet Little Jamison Creek to Jamison Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); elevation of upper lake, about 6,300 feet above sea level; elevation of lower lake, 6,200 feet. The connecting stream is less than one-eighth mile long and in the half mile between the lower lake and Grass Lake Little Jamison Creek falls about 300 feet. Downieville sheet.

Jaybird Creek (R); rises in Eldorado County, near the center of T. 11 N., R. 11 E., at altitude 2,400 feet above sea level; flows southward 1¼ miles into South Fork of American River (tributary through American River to the Sacramento); fall, 1,000 feet. Placerville sheet.

Jericho Creek (L); rises in Lake County, in the southeastern part of T. 12 N., R. 6 W.; flows southeastward 4 miles, then somewhat west of south 3 miles to its junction with Putah Creek (tributary to Yolo Basin) on the boundary between Napa and Lake counties. Punnett's map of Lake County.

Jerusalem Creek (L); rises in Lake County, in the southern part of T. 13 N., R. 6 W.; flows southward 8 miles into Putah Creek (tributary to Yolo Basin) in the eastern part of T. 11 N., R. 6 W.; tributary, Morgan Valley Creek. Punnett's map of Lake County.

Jerusalem Creek (R); rises in Shasta County, in T. 31 N., R. 8 W., on the south slope of Bully Choop Mountain, at altitude 5,000 feet above sea level; flows southeastward about 8 miles, then northeastward 2 miles into North Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River); fall, 4,200 feet. Red Bluff sheet.

Jim Crow Ravine Creek (L); rises in Sierra County, near the center of T. 19 N., R. 11 E., at altitude 5,500 feet above sea level; flows northwestward into North Fork of Yuba River (tributary to Middle Fork Yuba and thus through Yuba River to Feather River and the Sacramento); length, 5 miles; fall, 2,400 feet. Downieville sheet.

Johns Creek (R); rises in Shasta County, near the center of T. 34 N., R. 4 W., on east slope of O'Brien Mountain, at altitude 1,200 feet above sea level; flows southeastward into McCloud River (tributary to Pit River and thus to the Sacramento) at Baird; length, 1½ miles; fall, 500 feet. Redding sheet.

Johnson Canyon Creek (L); rises in Eldorado County, in the southeastern part of T. 11 N., R. 11 E., at altitude 2,800 feet above sea level; flows west of north into North Canyon Creek (tributary through South Fork of American River to American River and thus to the Sacramento); length, 1½ miles; fall, 1,000 feet. Placerville sheet.

Johntown Creek (R); rises in Eldorado County, in the western part of T. 12 N., R. 10 E., at altitude 2,050 feet above sea level; flows southeastward 4 miles into Irish Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 900 feet. Placerville sheet.

Jones Ravine Creek (L); rises in Nevada County, in the northwestern part of T. 16 N., R. 8 E., at altitude 1,900 feet above sea level; flows northwestward 1 mile into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 900 feet. Smartsville sheet.

Jordan Creek (R); rises in Nevada County, in the northwestern part of T. 17 N., R. 12 E., in Fuller Lake, at altitude 5,250 feet above sea level; flows southward 1½ miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 750 feet. Colfax sheet.

Joseph Creek (L); rises in eastern part of Modoc County, on Cedar Peak, at altitude about 6,000 feet above sea level; flows westward 8 miles into the North Fork of Pit River, which is tributary through Pit River to the Sacramento; fall, 1,300 feet. Alturas sheet.

Kaiser Creek (R); rises in Butte County, in the southwestern part of T. 25 N., R. 5 E., on the southern slope of Bald Hill, at altitude 5,700 feet above sea level; flows southeastward 3 miles into Kimshew Creek (tributary to West Branch of Feather River and thus through North Fork of Feather River to Feather River and the Sacramento); fall, 1,400 feet. Bidwell Bar sheet.

Kanaka Creek (L); rises in Butte County, in the western part of T. 24 N., R. 4 E., at altitude 4,000 feet above sea level; flows southwestward 1 mile then northward and westward 2 miles into East Fork of Butte Creek (tributary through Butte Creek to Butte Basin); fall, 1,500 feet; tributary Clear Creek. Chico sheet.

Kanaka Creek (R); rises in Sierra County, in the eastern part of T. 19 N., R. 10 E., at altitude 5,500 feet above sea level; flows southeastward into Middle Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); length, 10 miles; fall, 3,400 feet. Colfax sheet.

Kanaka Creek, Little (R); rises in Sierra County, in the eastern part of T. 19 N., R. 10 E., at altitude 5,000 feet above sea level; flows southward 2 miles into Concow Creek (tributary through Middle Fork of Yuba River and Yuba River to Feather River and thus to the Sacramento); fall, 600 feet. Colfax sheet.

Kaseberg Creek (L); rises in Placer County, in the southern part of T. 11 N., R. 6 E., just north of Roseville, at altitude 150 feet above sea level; flows northwestward 3½ miles into Pleasant Grove Creek (tributary to American Basin); channel tortuous; fall, about 50 feet; intermittent. Roseville sheet.

Kelsey Creek (R); rises in Lake County, in the northern part of T. 11 N., R. 8 W., on the eastern slope of the Coast Range; flows northwestward 9 miles, then somewhat east of north 8 miles into Clear Lake (outlet, Cache Creek to Yolo Basin). Punnett's map of Lake County.

Kentucky Ravine Creek (L); rises in Nevada County, in the western part of T. 16 N., R. 8 E., at altitude 2,000 feet above sea level; flows northwestward 5 miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento) at Bridgeport; fall, 1,400 feet. Smartsville sheet.

Kettle Rock Creek (L); rises in Plumas County, in the northern part of T. 26 N., R. 11 E., on the southern slope of Kettle Rock, at altitude 7,000 feet above sea level; flows southwestward about 2 miles into Peters Creek (tributary to Lights Creek which

flows through Indian Creek to the North Fork of the Feather and thence through Feather River to the Sacramento); fall, 2,500 feet. Indian Valley special map.

Keystone Creek (L); rises in Yuba County, in the western part of T. 18 N., R. 7 E., at altitude 1,700 feet above sea level; flows northwestward one-half mile into Maple Grove Creek (tributary through Indiana Creek to Dry Creek which flows through Yuba River to the Feather and thus to the Sacramento); fall, 100 feet. Smartsville sheet.

Keystone Ravine Creek (L); rises in Sierra County, in the northwestern part of T. 19 N., R. 12 E., on the west slope of Keystone Mountain, at altitude 6,500 feet above sea level; flows northwestward 2 miles into North Fork of Yuba River (tributary to Middle Fork of Yuba and thus through Yuba and Feather rivers to the Sacramento); fall, 2,500 feet. Downieville sheet.

Kidds Lakes. See *Cascade Lakes.*

Kimshew Creek (L); rises in Butte County, in the southern part of T. 25 N., R. 5 E., 2 miles north of Table Mountain, at altitude 6,000 feet above sea level; flows very irregularly southwestward into West Branch of Feather River (tributary to North Fork of Feather River and thus through Feather River to the Sacramento); length, 10 miles; fall, 3,300 feet; principal tributaries, Little Kimshew, Kaiser and Little Rock creeks. Bidwell Bar sheet.

Kimshew Creek, Little (L); rises in Butte County, in the southern part of T. 25 N., R. 5 E., on the east slope of Table Mountain, at altitude 5,900 feet above sea level; flows southward 4 miles, westward one-half mile into Kimshew Creek (tributary to West Branch of Feather River and thence through North Fork of Feather River and Feather River to the Sacramento); fall, 1,800 feet. Bidwell Bar sheet.

Kingsley Gulch Creek (L); rises in Tehama County, in the southwestern part of T. 27 N., R. 1 W., at altitude 1,300 feet above sea level; flows southwestward 6½ miles into Antelope Creek (tributary to Sacramento River) in the southern part of Rio de los Berrendos Rancho; fall, 1,070 feet, of which 950 feet occurs in the gulch; intermittent. Tehama sheet.

Kirk Lake; Sutter Basin, Sutter County, 1 mile south of Kirkville; a permanent water body about 1 mile long, very narrow and peculiarly curved. Dunnigan sheet.

Knickerbocker Creek (L); rises in Eldorado County, in the western part of T. 12 N., R. 9 E., at altitude 1,450 feet above sea level; flows southwestward 2 miles into North Fork of American River (tributary through American River to the Sacramento); fall, 1,000 feet. Sacramento sheet.

Knownothing Creek (R); rises in Butte County, in the southeastern part of T. 27 N., R. 7 E., at altitude 4,100 feet above sea level; flows somewhat west of south to junction with South Fork of Feather River (tributary to Middle Fork of Feather and thus through Feather River to the Sacramento); length, 3½ miles; fall, 1,500 feet. Bidwell Bar sheet.

Kosk Creek (R); rises in Shasta County, in the northeastern part of T. 38 N., R. 1 E., at altitude 4,000 feet above sea level; flows southwesterly 8 miles, then almost due south 5 miles to its junction with Pit River (through which it is tributary to Sacramento River); fall, 2,300 feet; gaging station at Henderson, 1910–11. Modoc Lava Bed sheet.

Kusal Slough; Butte County, Rancho Arroyo Chico; connects the lower part of Pine Creek with Mud Creek, through which it discharges into Chico Creek and the Sacramento. Chico Landing sheet.

Lack Creek (L); rises in Shasta County, in the southern part of T. 31 N., R. 2 W., at altitude 3,200 feet above sea level; flows westward into Bear Creek (tributary to Sacramento River); length, 14 miles; fall, 2,700 feet, of which 1,200 feet occurs in the first 4 miles of course. Lassen Peak and Red Bluff sheets.

Ladies Canyon Creek (R); Eldorado County; rises in the northern part of T. 10 N., R. 11 E., at altitude 2,700 feet; flows northwestward 3½ miles into South Fork of

American River (tributary through American River to the Sacramento); fall, 1,500 feet. Placerville sheet.

Ladies Canyon Creek (R); Sierra County; rises in the western part of T. 20 N., R. 12 E., on the west slope of Sierra Buttes, at altitude 8,000 feet above sea level; flows southwestward 5 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba to Yuba River, and thus through Feather River to the Sacramento); fall, 4,500 feet. Downieville sheet.

Lady Canyon Creek (R); rises in Placer County, in the southeastern part of T. 14 N., R. 11 E., at altitude 3,000 feet above sea level; flows southward 2 miles into Middle Fork of American River (tributary through North Fork of American to American River and thus to the Sacramento); fall, 1,800 feet. Colfax sheet.

Laguna Creek (R); rises in Solano County, in the southeastern part of T. 6 N., R. 2 W., at altitude 1,000 feet above sea level; flows eastward 3 miles into Alamo Creek (tributary to Cache Slough, Yolo Basin); fall, about 700 feet. Napa sheet.

Lake of the Woods; Yuba County, one-fourth mile west of Feather River and one-half mile northwest of Bear River, formed by overflow from Feather and Bear rivers. This lake is about a mile long, its water surface is 27 feet above sea level. The ridge separating the lake from the river is about 8 feet high. Its waters are connected with those of Feather River only when the latter is in flood. Nicolaus sheet.

Laniger Lakes (4); Tehama County, T. 25 N., R. 1 W.; intermittent water bodies; elevation, 215 feet; no outlet shown on map, but lakes are probably at times connected with an intermittent stream flowing southwestward into the Sacramento opposite the lower end of Blethen Island. Vina sheet.

Lassen Creek (L); rises in the eastern part of Modoc County, on the western slope of Warner Mountains, at altitude 6,000 feet above sea level; flows northwestward about 12 miles into Goose Lake, which at exceptionally high stages may discharge into the North Fork of Pit River and thus through Pit River to the Sacramento; fall, 1,200 feet. Alturas sheet.

Last Chance Creek (L); Butte County; rises in the western part of T. 25 N., R. 5 E., at altitude 6,000 feet above sea level; flows southwestward about 7 miles into West Branch of Feather River (tributary to North Fork of Feather River and thus through Feather River to the Sacramento); fall, 2,600 feet. Bidwell Bar and Chico sheets.

Last Chance Creek (L); Plumas County; rises in the southern part of T. 23 N., R. 9 E., at altitude 5,000 feet above sea level; flows northwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 1 mile; fall, 1,800 feet. Downieville sheet.

Last Chance Creek (R); Plumas County; rises near the center of T. 25 N., R. 15 E., at altitude 7,300 feet above sea level; flows eastward 4 miles, then southward 16 miles to its junction with the Middle Fork of Feather River (tributary through Feather River to the Sacramento) near the east end of Sierra Valley; fall, 2,300 feet; for 2 miles or more above mouth flows in several interlacing channels; tributaries include streams from Adams Peak and Dixie Mountain. The only tributary named on the map is Frenchman Creek. This creek drains a larger area than is drained by any other headwater stream of the Middle Fork and may therefore be regarded as the continuation of that stream. Sierraville sheet.

Last Chance Creek (R); Plumas County; rises in the northeastern part of T. 25 N., R. 15 E., on east slope of McKesick Peak (altitude 7,083 feet) about 4 miles south of Honey Lake; flows irregularly westward 8 miles, then southward 4 miles into Squaw Creek (tributary to Red Clover Creek which flows through Indian Creek to the North Fork of Feather River to the Feather River and thence to the Sacramento); fall, 1,800 feet. Honey Lake sheet.

Lichen Creek (L); rises in Eldorado County, in the southeastern part of T. 12 N., R. 9 E., on the north slope of Mount Ararat, at altitude 2,000 feet above sea level;

flows southwestward about 3 miles into Greenwood Creek (tributary through South Fork of American River to American River and thus to the Sacramento) at Magnolia; fall, 1,300 feet. Placerville sheet.

Lick Creek (R); rises in Shasta County, near the center of T. 35 N., R. 2. W., on the eastern slope of Brock Butte, at altitude 2,900 feet above sea level; flows southward 5 miles to junction with Pit River (tributary to Sacramento River); fall, 1,900 feet. Land Office map; called Ripgut Creek on Redding sheet.

Lights Creek (R); rises in Plumas County, in the northern part of T. 28 N., R. 11 E., on the west slope of Diamond Mountain (altitude 6,000 feet above sea level); flows somewhat west of south about 20 miles to junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento) at upper end of Indian Valley; fall, about 2,500 feet; principal tributaries, Surprise, Peters and Cook Canyon creeks. For lower 5 miles of course passes through north arm of Indian Valley. Honey Lake and Indian Valley special maps.

Lincoln Creek (L); rises in Sierra County, in the north central part of T. 20 N., R. 13 E., at altitude 7,000 feet above sea level; flows northwestward into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento) 1 mile west of Summit House; length, 3 miles; fall, about 700 feet; open meadow at head. Downieville sheet.

Linda Creek (L); rises in Placer County, in the northwestern part of T. 11 N., R. 8 E., 2 miles southeast of Newcastle, at altitude 800 feet above sea level; flows very irregularly southwestward about 26 miles and discharges into Bush Lake at the south end of American Basin; fall in the 11 miles above Roseville 700 feet; principal tributary Dry Creek (called Antelope Creek on the Sacramento and Fairoaks sheets). See Antelope and Arcade sheets.

Lindsey Lakes; Nevada County, central part of T. 18 N., R. 12 E., outlet a stream 1½ miles long flowing westward into Texas Creek (tributary through Canyon Creek to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); 4 small connected lakes, the lowest being 6,500 feet above sea level and the highest 6,650 feet; fall of outlet, above junction with Texas Creek, 1,000 feet. Colfax sheet.

Little. See name of main creek.

Logan Creek (R); rises in Glenn County, near the center of T. 19 N., R. 5 W.; flows southward about 3 miles, eastward 4 miles, and then takes a general southeasterly course; discharges into the Colusa Basin in the northern part of Colusa County; principal tributary, North Fork. Sheet C, Sacramento Valley map.

Logan Creek, North Fork (L); rises in Glenn County, in the eastern part of T. 19 N., R. 5 W.; flows southeastward into Logan Creek, which discharges into the Colusa Basin; intermittent. Sheet C, Sacramento Valley map.

Logtown Ravine Creek (L); rises in Eldorado County, in the northeastern part of T. 9 N., R. 10 E., near Logtown, at altitude 1,900 feet above sea level; flows northward 2 miles into Slate Creek (tributary through Dry Creek to Webber Creek, which flows through South Fork of American River to American River and thus to the Sacramento); fall, 400 feet. Placerville sheet.

Lone Rock Creek (R); rises in Plumas County, in the southeastern part of T. 28 N., R. 11 E., on the south slope of Lone Rock, at altitude 5,600 feet above sea level; flows southeastward 4 miles, thence eastward 3 miles into Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, about 700 feet. Honey Lake sheet.

Long Canyon Creek (L); Eldorado County; rises in the southern part of T. 11 N., R. 12 E., at altitude 3,700 feet above sea level; flows north of west 5 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 2,000 feet. Placerville sheet.

Long Canyon Creek (R); Placer County; rises in the southern part of T. 14 N., R. 13 E., where it is formed by the junction of its north and south forks. The South Fork rises in the southern part of T. 15 N., R. 14 E., at altitude 7,000 feet above sea level and flows southwestward about 10 miles. The North Fork rises in the northwestern part of T. 14 N., R. 14 E., at altitude 6,500 feet above sea level and flows southwestward 6 miles. Below the junction this creek continues a southwesterly course for 10 miles to Rubicon River (tributary through Middle Fork of American to North Fork of American and thus through American River to the Sacramento); length to head of South Fork, about 20 miles; fall, 4,500 feet. The South Fork flows through Big Meadows. Truckee, Colfax, and Placerville sheets.

Long Gulch Creek (L); Butte County; rises in the west-central part of T. 24 N., R. 4 E., at altitude 4,200 feet above sea level; flows southward 5 miles into Little West Branch (Feather River) Creek (tributary to West Branch of Feather River, which flows through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 1,400 feet. Chico sheet.

Long Gulch Creek (L); Shasta County; rises in the western part of T. 33 N., R. 2 W., at altitude 1,400 feet above sea level; flows northwestward 1 mile into Pit River (tributary to Sacramento River); fall, 600 feet. Redding sheet.

Long Gulch Creek (L); Tehama County; rises in the southern part of T. 27 N., R. 1 W., at altitude 1,600 feet above sea level; flows in a general southwesterly course about 10 miles to junction with Antelope Creek (tributary to Sacramento River) in Rio de los Berrendos Rancho; fall, 1,340 feet, of which 1,300 feet occurs in the gulch; intermittent. Tehama sheet.

Long Lake; Plumas County; T. 21 N., between Rs. 11 and 12 E.; 2 inlets draining small lakes; outlet, Gray Eagle Creek to Middle Fork of Feather River (tributary through Feather River to the Sacramento); elevation, 6,700 feet above sea level; fall of outlet, 2,200 feet in 6 miles. Downieville sheet.

Long Lake; Sutter Basin, east side of Sacramento River in Sutter County, 6 miles southwest of Sutter City. A permanent water body in the marsh south of Butte Slough. Marysville sheet.

Long Valley Creek (R); Lake County; rises in the western part of T. 15 N., R. 8 W., 3 miles northeast of Morrison Landing on Clear Lake; flows southeastward about 11 miles to junction with the North Fork of Cache Creek (tributary through Cache Creek to Yolo Basin) ½ mile southeast of Arabella. Punnett's maps of Lake and Mendocino counties; Land Office map (1907).

Long Valley Creek (R); Plumas County; rises in the northeastern part of T. 23 N., R. 12 E., at altitude 7,000 feet above sea level, takes a general westerly course to its junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 8 miles; fall, 2,900 feet; tributaries, Bull Run and Little Long Valley creeks. Downieville sheet.

Long Valley Creek (R); Sierra County; rises in the southern part of T. 20 N., R. 13 E., at altitude 7,600 feet above sea level; flows southwestward 2 miles into South Fork of North Fork of Yuba River (tributary to North Fork of Yuba, which flows to Middle Fork of Yuba and thus through Yuba and Feather rivers to the Sacramento); fall, 1,900 feet. Downieville sheet.

Long Valley Creek, Little (R); rises in Plumas County, in the southern part of T. 24 N., R. 12 E., at altitude 6,900 feet above sea level; flows southwestward 4½ miles into Long Valley Creek (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); fall, 2,700 feet. Downieville sheet.

Loon Lake; Eldorado County, northeastern part of T. 13 N., R. 15 E.; outlet, Gerlé Creek to Little South Fork of Rubicon River (tributary through Rubicon River to Middle Fork of American River and thus through American River to the Sacramento); elevation, 6,300 feet; the northern arm of this lake is called Pleasant Lake. Truckee and Pyramid Peak sheets.

Lost Canyon Creek (R); rises in Placer County, in the eastern part of T. 15 N., R. 12 E., at altitude 5,400 feet above sea level; flows southwestward 3 miles into North Fork of Middle Fork of American River (tributary through Middle Fork of American to North Fork of American and thus through American River to the Sacramento); fall, 2,000 feet. Colfax sheet.

Lost Creek (L); Plumas County; rises in the northwestern part of T. 21 N., R. 9 E., 3 miles northwest of La Porte, at altitude 5,800 feet above sea level flows southwestward to its junction with South Fork of Feather River (tributary through Middle Fork of Feather River and Feather River to the Sacramento) in Butte County, in the southeastern part of T. 20 N., R. 7 E.; length, 15 miles; fall, 3,500 feet; principal tributaries, Sly, Pinkard, and Eagle Gulch creeks. Downieville and Bidwell Bar sheets.

Lost Creek (L); Shasta County; rises in the northern part of T. 32 N., R. 3 E., on the south slope of Crater Peak, at altitude 6,700 feet above sea level; flows southeastward about 4 miles, then winds eastward to its junction with Hat Creek (tributary to Pit River and thus to the Sacramento) in the south-central part of T. 32 N., R. 4 E.; length, about 10 miles; fall, 2,200 feet. Lassen Peak sheet.

Lower Salmon Lake. See *Salmon Lakes, Upper and Lower.*

Lower Sardine Lake. See *Sardine Lakes, Upper and Lower.*

Lytton Lake; Nevada County, western part of T. 17 N., R. 15 E., near Summit; outlet a stream 1 mile long flowing southwestward to South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); elevation, 7,300 feet; fall of outlet, 500 feet. Truckee sheet.

McCabe Creek (L); rises in Butte County, in the northern part of T. 19 N., R. 6 E., 1½ miles west of Forbestown, at altitude 2,900 feet above sea level; flows westward 3 miles, then northwestward 2 miles into South Fork of Feather River (tributary to Middle Fork of Feather and thus through Feather River to Sacramento River); fall, 2,300 feet. Bidwell Bar sheet.

McCandless Gulch Creek (R); rises in Shasta County, in the eastern part of T. 34 N., R. 2 W., at altitude 2,100 feet above sea level; flows southeastward 2 miles into Cedar Creek (tributary through Little Cow Creek to Cow Creek, and thus to the Sacramento); fall, 800 feet. Redding sheet.

McCloud River (R); rises in Shasta County, in the northern part of T. 38 N., R. 1 E., at altitude (approximate) 5,000 feet above sea level; flows northward 5 miles into Siskiyou County (T. 39 N., R. 1 E.), then very irregularly westward 10 miles into T. 39 N., R. 2 W., then turns abruptly and takes a general southwesterly course to its junction with Pit River (tributary to Sacramento River) in Shasta County, in the southern part of T. 34 N., R. 4 W., 4 miles east of the mouth of the Pit; length, about 60 miles; fall, 4,200 feet; receives large supplies of water from springs issuing from the lava beds at the southern base of Mount Shasta; also direct surface drainage from the southern and eastern slopes of Mount Shasta through Squaw, Mud, Cold, and Ash creeks, its principal tributaries; drainage area, about 650 square miles; gaging station near Baird, 1910-11. Shasta and Redding sheets.

McClure Creek (R); rises in Tehama County, in the southern part of T. 25 N., R. 3 W., at altitude 320 feet above sea level; flows somewhat north of east about 6 miles into Saucos Rancho, where its channel connects with that of Truckee Creek, whose water sinks before reaching the Sacramento; fall, about 100 feet; intermittent. Tehama sheet.

McGriff Lakes (two); Sutter Basin, 1 mile east of Knights Landing, on east side of Sacramento; altitude 17 feet above sea level; permanent. Knights Landing sheet.

McMurray Lake; Nevada County, southern part of T. 19 N., R. 12 E., or northern part of T. 18 N., R. 12 E.; outlet by stream 3 miles long flowing northwestward into South Fork of Middle Fork of Yuba River (tributary through Middle Fork of Yuba River to Feather River and thus to the Sacramento); elevation, 5,800 feet above sea level. Colfax sheet.

Mad Canyon Creek (R); rises in Placer County, in the central part of T. 14 N., R. 11 E., at altitude 3,400 feet above sea level; flows southwestward 2 miles into Middle Fork of American River (tributary through North Fork of American to American and thus to the Sacramento); fall, 2,200 feet. Colfax sheet.

Magpie Creek (L); rises in Sacramento County, in Rancho del Paso, 1 mile southwest of Antelope, at altitude 150 feet above sea level; flows southwestward about 6 miles, sinks before reaching Bush Lake in American Basin; fall, about 100 feet; intermittent. Arcade sheet.

Manhattan Creek (R); rises in Eldorado County, in the central part of T. 12 N., R. 10 E., at altitude 2,300 feet above sea level; flows southeastward 2½ miles, and unites with Empire Creek to form Irish Creek (tributary to South Fork of American River, and thus through American River to the Sacramento); fall, 400 feet. Placerville sheet.

Manzanita Creek (L); rises in Shasta County, in the southern part of T. 31 N., R. 4 E., on the west slope of Lassen Peak, at altitude 8,000 feet above sea level; flows northwestward about 5 miles, passing through Manzanita Lake to Deer Flat Creek (tributary through North Fork of Battle Creek to Battle Creek and thus to Sacramento River); fall, 3,200 feet. Lassen Peak sheet.

Manzanita Lake; Shasta County, in the southwestern part of T. 31 N., R. 4 E., northwest of Lassen Peak; inlet, Manzanita Creek; outlet, Manzanita Creek to Deer Flat Creek (tributary through North Fork of Battle Creek to Battle Creek and thus to Sacramento River); elevation, 5,600 feet. Lassen Peak sheet.

Maple Branch Mud Creek. See *Mud Creek, Maple Branch.*

Maple Grove Creek (L); rises in Yuba County, in the west central part of T. 18 N., R. 7 E., at altitude 2,500 feet above sea level; flows southwestward about 2 miles into Indiana Creek (tributary through Dry Creek to Yuba River and thus through Feather River to the Sacramento); fall, 800 feet. Smartsville sheet.

Marble Creek (R); rises in Plumas County, near the center of T. 23 N., R. 6 E., on the south slope of Soapstone Hill, at altitude 5,300 feet above sea level; flows somewhat east of south 7 miles to its junction with Little North Fork of Feather River (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento) in Butte County, in the southeastern part of T. 22 N., R. 6 E.; fall, 2,400 feet. Bidwell Bar sheet.

Markham Ravine Creek (L); rises in Placer County, in the northeastern part of T. 12 N., R. 6 E., about 3 miles northeast of Lincoln, at altitude 250 feet above sea level; flows south of west about 18 miles (in a straight line) and discharges into American Basin through Bunkham Slough; intermittent. The channel followed by this creek is exceedingly tortuous and the length by the stream course is much greater than that in a straight line. Lincoln, Sheridan, Nicolaus, and Vernon sheets.

Mary Lake; Placer County, western part of T. 17 N., R. 15 E., on northwest slope of Donner Peak; outlet to South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); elevation, 7,050 feet above sea level. Truckee sheet.

Mary Lake; Sutter Basin, Sutter County, $\frac{1}{16}$ mile east of Sacramento River, 1 mile south of McGriff Lakes; elevation, 17 feet above sea level. Knights Landing sheet.

Massack Creek (R); rises in Plumas County in the southeastern part of T. 25 N., R 10 E., at altitude 5,000 feet above sea level; flows southwestward 1½ miles then north of west ½ mile to Spring Garden Creek (tributary to Spanish Creek, thence through Indian Creek to North Fork of Feather River, to Feather River, and into the Sacramento); fall, 1,400 feet. Downieville sheet.

Mathles Creek (L); rises in Shasta County, in the eastern part of T. 35 N., R. 3 W., on the west slope of Salt Creek Mountain, at altitude 3,900 feet above sea level; flows westward about 3 miles into McCloud River (tributary through Pit River to the Sacramento); fall, 2,800 feet. Redding sheet.

Meadow Lake; Nevada County, central part of T. 18 N., R. 13 E., at Summit City outlet a stream 1 mile long flowing southward to Fordyce Lake (outlet, Fordyce Creek to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); elevation, 7,300 feet; fall of outlet, 1,000 feet. This lake is about a mile long and half a mile wide. Truckee sheet.

Meadow Creek, West (R); rises in Placer County in T. 14 N., R. 15 E., at altitude 7,500 feet above sea level; flows southwestward 2½ miles into Barker Creek (tributary through Rubicon to Middle Fork of American River and thus through North Fork of American and American rivers to the Sacramento); fall, 1,900 feet. Truckee sheet.

Mears Creek (R); rises in northwestern Shasta County, in the southern part of T. 38 N., R. 5 W., on the eastern slope of Trinity Mountains; flows southeastward about 5 miles to its junction with Sacramento River in the western part of T. 37 N., R. 4 W. Punnett's map of eastern part of Siskiyou County (1909); Denny's map of Shasta County.

Medora Lakes; Little and Big; Yolo Basin, northern part of Solano County, in the tidal marsh north of Miner Slough. Sheet P, Sacramento Valley map.

Messick Lake. See *Plumas Lake.*

Middle Branch or Fork. See name of main stream.

Middle [Cache] Creek (L); Lake County; rises in the western part of T. 17 N., R. 10 W., on the eastern slope of the Coast Range; flows southeastward to Clear Lake (outlet Cache Creek to Yolo Basin). Punnett's map of Lake County.

Middle Creek (R); Shasta County; rises in the southeastern part of T. 32 N., R. 6 W., about 1,000 feet above sea level; flows eastward into Sacramento River near Waugh; length, 2½ miles; fall, 500 feet; intermittent. Redding sheet.

Middle Creek, East (L); rises in Lake County in the southeastern part of T. 16 N., R. 9 W., flows northwestward 7 miles, then turns abruptly and flows southwestward 3 miles to its junction with Middle Creek (tributary through Clear Lake to Cache Creek and thus to Yolo Basin). Punnett's map of Lake County.

Milk Ranch Creek (L); rises in Plumas County, in the northwestern part of T. 24 N., R. 7 E., at altitude 6,500 feet above sea level; flows northwestward 3 miles, then east of north 3 miles into Mill Creek (tributary through Indian Creek to North Fork of Feather River and thus through Feather River to the Sacramento); fall, 4,000 feet. Bidwell Bar sheet.

Mill Creek (L); Butte County; rises in the southwestern part of T. 23 N., R. 5 E., at altitude 4,000 feet above sea level; flows westward to junction with North Fork of Feather River (tributary through Feather River to the Sacramento); length, 4 miles; fall, 2,500 feet. Bidwell Bar sheet.

Mill Creek (L); Colusa County; rises in the western part of T. 16 N., R. 6 W.; flows southeastward 4 miles into Bear Creek. Punnett's map of Colusa County.

Mill Creek (R); Plumas County; rises in the northeastern part of T. 23 N., R. 9 E., at altitude 6,200 feet above sea level; flows northeastward 4 miles, then northwestward 2 miles to junction with Spanish Creek (tributary to Indian Creek and thence through North Fork of Feather River to the Feather River and into the Sacramento); fall, 2,800 feet, of which 2,000 feet occurs in the first 2 miles at head. Indian Valley special map.

Mill Creek (L); Shasta County; rises in the southern part of T. 30 N., R. 4 E., emerging from Crumbo Lake at altitude 7,500 feet above sea level; flows southward about 16 miles, then southwestward 26 miles to junction with Sacramento River in Rio de los Molinos Rancho; fall, 7,300 feet, of which 3,000 feet occurs in the first 4 miles of course; gaging station at Los Molinos, 1909. Lassen Peak and Tehama sheets.

Mill Creek (L); Yuba County; rises in the southeastern part of T. 19 N., R. 8 E., at altitude 3,500 feet above sea level; flows southwestward 5 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba River to Yuba River, Feather and Sacramento rivers); fall, 1,800 feet. Smartsville sheet.

Miller Canyon Creek (R); rises in Solano County, in the southwestern part of T. 7 N., R. 2 W., on the eastern slope of Vaca Mountains, at altitude 2,000 feet above

sea level; flows somewhat north of east three miles into Pleasants Creek (tributary through Putah Creek to Yolo Basin); fall, about 1,600 feet. Napa sheet.

Millers Creek (R); rises in Eldorado County, in the south-central part of T. 14 N., R. 16 W., just south of the Placer and Eldorado County boundary line, at altitude 7,142 feet above sea level; flows south of west 3 miles into Rubicon River (tributary through Middle Fork of American River to North Fork of American and thus through American River to the Sacramento); fall, 1,142 feet. Truckee sheet.

Milton Creek (L); rises in Sierra County, in the western part of T. 19 N., R. 13 E., on the west slope of Bald Ridge, at altitude 6,000 feet above sea level; flows northwestward into the South Fork of North Fork Yuba River (tributary through North Fork of Yuba to Middle Fork of Yuba and thus through Yuba and Feather rivers to the Sacramento); length, 3 miles; fall, 1,100 feet. Downieville sheet.

Miner Slough; Yolo Basin, extending along the north side of Ryer Island between Cache Slough and Sutter Slough. Sacramento Valley map.

Missouri Canyon Creek (R); rises in Eldorado County, in the north-central part of T. 13 N., R. 11 E., at altitude 3,300 feet above sea level; flows southwestward 2½ miles into Otter Creek (tributary to Middle Fork of American River, which flows through North Fork of American and American rivers to the Sacramento); fall, 800 feet. Placerville sheet.

Modin Creek (L); rises in Shasta County, in the eastern part of T. 36 N., R. 2 W., at altitude 3,500 feet above sea level; flows southwestward about 2 miles into Squaw Creek (tributary to Pit River, which flows into Sacramento River); fall, about 1,400 feet; intermittent in upper course. Redding sheet.

Mohawk Creek (L); rises in Sierra County, in the northeastern part of T. 21 N., R. 13 E., at altitude 5,400 feet above sea level; flows northwestward 8 miles into Middle Fork of Feather River (tributary through Feather River to the Sacramento) which it enters in Plumas County in the southeastern part of T. 22 N., R. 12 E.; drains the upper end of Mohawk Valley; fall, 1,100 feet. Downieville sheet.

Montgomery Creek (L); rises in Plumas County, in the eastern part of T. 25 N., R. 10 E., on the west slope of Grizzly Mountains, at altitude 6,800 feet above sea level; flows southwestward 1 mile, northward 1½ miles, and then northeastward 1 mile to junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 3,200 feet; encircles north end of Grizzly Mountain. Indian Valley special map.

Montgomery Creek (L); rises in Shasta County, in the northeastern part of T. 34 N., R. 1 E., 4,200 feet above sea level; flows northwestward 12 miles to its junction with Pit River, through which it is tributary to Sacramento River; fall, 2,900 feet. Lassen Peak sheet.

Monumental Creek (R); rises in Placer County, in the northeastern part of T. 16 N., R. 12 E., at altitude 6,300 feet above sea level; flows southeastward 3 miles to its junction with East Fork of North Fork of North Fork of American River, to American River, and thus to the Sacramento; fall, 1,800 feet. Colfax sheet.

Moody Creek (R); rises in Shasta County, in the western part of T. 33 N., R. 4 W., on the south slope of Bass Mountain, at altitude 1,100 feet above sea level; flows southeastward 5 miles into the West Fork of Stillwater Creek (tributary through Stillwater Creek to Sacramento River); fall, about 400 feet; principal tributary, Rancheria Creek; intermittent. Redding sheet.

Moonlight Creek. See *Surprise Creek.*

Moonshine Creek (R); rises in Yuba County, in the central part of T. 18 N., R. 8 E., at altitude 2,200 feet above sea level; flows southward 3 miles into Middle Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); fall, 800 feet. Smartsville sheet.

Morgan Valley Creek (L); rises in Lake County, in the southeastern part of T. 13 N., R. 6 W., flows southeastward 3 miles, then in general southwestward 3 miles

into Jerusalem Creek (tributary through Putah Creek to Yolo Basin). Punnett's map of Lake County.

Mormon Basin; a minor basin lying between Upper Sycamore Slough and the west bank of Sacramento River below the town of Sycamore. See *Colusa Basin.* Sheet E, Sacramento Valley map.

Morrison Creek (L); rises in Rio de los Americanos Rancho, south of American River, at altitude 120 feet above sea level; flows southwestward into American Basin; intermittent. Fairoaks sheet.

Morris Ravine Creek (R); rises in Butte County, in the southwestern part of T. 20 N., R. 4 E., at altitude 600 feet above sea level; flows southeastward 2 miles into Feather River (tributary to Sacramento River); fall, 400 feet. Chico sheet.

Mosquito Creek (L); Butte County; rises in the northern part of T. 21 N., R. 6 E., at altitude 3,500 feet above sea level; flows westward into French Creek (tributary to North Fork of Feather River and thus through Feather River to the Sacramento); length, 4 miles; fall, 2,100 feet. Bidwell Bar sheet.

Mosquito Creek (L); Butte County; rises in the northwestern part of T. 23 N., R. 4 E., at altitude 3,000 feet above sea level; flows southwestward 2 miles into Little Butte Creek (tributary through Butte Creek to Butte Basin); fall, 600 feet. Chico sheet.

Mosquito Creek (R); Eldorado County; rises in the center of T. 11 N., R. 11 E., at altitude 2,400 feet above sea level; flows southeastward 2 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 1,000 feet. Placerville sheet.

Mosquito Creek (R); Plumas County; rises in western part of T. 26 N., R. 7 E., at altitude 5,300 feet above sea level; flows southward about 4 miles into North Fork of Feather River (tributary through Feather River to the Sacramento) 5 miles below the mouth of Butt Creek; fall, 2,900 feet. Lassen Peak sheet.

Mosquito Creek (R); Shasta County; rises in the southwestern part of T. 36 N., R. 5 W., on the eastern slope of Trinity Mountains, at altitude (approximate) 3,500 feet above sea level; flows eastward to its junction with Sacramento River half a mile north of Delta; length, about 3 miles; fall, 2,200 feet. Redding sheet (on which it is unnamed); Denny's map of Shasta County.

Mountain House Creek (R); rises in Butte County, in the northern part of T. 21 N., R. 6 E., near Mountain Cottage, at altitude 3,600 feet above sea level; flows northeastward 2½ miles into Little North Fork of Feather River (tributary to Middle Fork of Feather River and thus through Feather River to the Sacramento); fall, 1,400 feet. Bidwell Bar sheet.

Mud Creek (L); Butte County; formed in T. 23 N., R. 2 E., by the union of Maple and East branches; the East Branch is formed by the West and Middle branches; the Middle Branch, which may be considered the head of the stream, rises in the northwestern part of T. 24 N., R. 3 E., at altitude 3,700 feet above sea level, and flows southward 5 miles, descending in this distance, 1,500 feet, to its junction with the West Branch; from this junction the East Branch flows southwestward about 5 miles, descending 1,600 feet, to the point where it receives Maple Branch; below the mouth of Maple Branch the main creek continues in a southwesterly course about 12 miles, then turns and flows northwestward, discharging into the Sacramento through Big Chico Creek; connected with Pine Creek by Kusal Slough; length, about 22 miles; fall to head of Middle Branch, 3,500 feet. Chico sheet.

Mud Creek (R); Siskiyou County; rises on the southeastern slope of Mount Shasta, at altitude 8,000 feet above sea level; flows southward about 16 miles to its junction with McCloud River (tributary to Pit River and thus to the Sacramento); fall, 5,300 feet, of which 4,000 feet occurs in the upper 7 miles of course. Shasta sheet.

Mud Creek, Maple Branch (R); rises in Butte County, in the eastern part of T. 24 N., R. 2 E., on the east slope of Keefer Ridge, at altitude 2,300 feet above sea level; flows southwestward about 5 miles, and unites with the East Branch to form Mud Creek (tributary to Sacramento River through Big Chico Creek); fall, 1,600 feet. Chico sheet.

Mud Creek, West Branch (R); rises in Butte County, in the northeastern part of T. 24 N., R. 2 E., on the east slope of Keefer Ridge, at altitude 3,500 feet above sea level; flows southward 4 miles, and unites with Middle Branch to form East Branch of Mud Creek (tributary through Mud Creek to the Sacramento); fall, about 1,300 feet. Chico sheet.

Murphy Lake; American Basin, east side Feather and Sacramento rivers, Sutter County, 2½ miles east of Feather River and 2 miles north of the Sacramento; a permanent water body about 4 miles long inclosed by levees. Vernon sheet.

Mutton Canyon Creek (L); rises in Eldorado County, near the center of T. 12 N., R. 12 E.; flows northeastward 2 miles into Pilot Creek (tributary through Rubicon River and Middle Fork of American River and thus through North Fork of American and American rivers to the Sacramento); fall, 500 feet. Placerville sheet.

Myrtle Creek (L); rises in the northeastern part of Modoc County, on the western slope of Warner Mountains, at altitude 6,000 feet above sea level; flows north of west about 4 miles into Goose Lake, which at exceptionally high stages may be tributary to the North Fork of Pit River and thus through Pit River to the Sacramento; fall, 1,200 feet. Alturas sheet.

Mystic Lake; Sutter Basin, Sutter County, one-fourth mile south of Horseshoe Lake and one-eighth mile east of the river. Dunnigan sheet.

Natchez Honcut Creek. See *Honcut Creek, Natchez.*

Nawtawakit Creek (R); rises in Shasta County, in the eastern part of T. 36 N., R. 4 W., on the western slope of Nawtawakit Mountain, 3,500 feet above sea level; flows southeastward 3½ miles into McCloud River (tributary through Pit River to the Sacramento); fall, 2,400 feet; intermittent. Redding sheet.

Negro Creek (L); rises in Nevada County, in the southeastern part of T. 16 N., R. 7 E., at altitude 1,800 feet above sea level; flows north of west into Deer Creek (tributary through Yuba River to Feather River and thus to the Sacramento); length 2½ miles; fall, 700 feet. Colfax sheet.

Negro Run (R); rises in Plumas County, in the eastern part of T. 22 N., R. 7 E., at altitude 5,100 feet above sea level; flows southward into South Branch of Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 1½ miles; fall, 500 feet. Bidwell Bar sheet.

Nelson Creek (R); Shasta County; rises in the southern part of T. 33 N., R. 5 W., at altitude 1,000 feet above sea level; flows southeastward 2 miles into Churn Creek (tributary to Sacramento River) 1 mile below Churntown; fall, about 250 feet; intermittent. Red Bluff and Redding sheets.

Nelson Creek (R); Shasta County; rises in the northeastern part of T. 37 N., R. 1 E., at altitude 4,600 feet above sea level; flows southwestward about 8 miles to its junction with Pit River (through which it is tributary to Sacramento River) 3 miles southeast of Henderson; fall, 2,900 feet; many small branches. Modoc Lava Bed sheet.

Nelson Creek (L); Plumas County; rises in the southeastern part of T. 22 N., R. 11 E., at altitude 7,000 feet above sea level; flows northwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 11 miles; fall, 2,100 feet; tributaries, East Branch and Poorman creeks. Downieville sheet.

Nelson Creek, East Branch (R); rises in Plumas County near the center of T. 22 N., R. 11 E., at altitude 7,000 feet above sea level; flows northwestward into

Nelson Creek (tributary through Middle Fork of Feather River to Feather River and the Sacramento); length, 5 miles; fall, 2,400 feet. Downieville sheet.

Nelson Slough; Sutter Basin, extends southeastward into the basin from the right bank of Feather River 1½ miles west of Nicolaus. Nicolaus sheet.

New Creek (L); Tehama County, Rio de los Berrendos Rancho; one of several channels through which Antelope Creek reaches the Sacramento; New Creek leaves Antelope Creek at altitude about 310 feet above sea level, flows southwestward 3 miles, and enters the Sacramento through Salt Creek; fall, about 70 feet; intermittent. Tehama sheet.

New York Canyon Creek (R); Placer County; rises in the northern part of T. 14 N., R. 10 E., at altitude 3,000 feet above sea level; flows southwestward 2 miles into Shirttail Canyon Creek (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,200 feet. Colfax sheet.

New York Canyon Creek (L); Placer County; rises in the northern part of T. 15 N., R. 13 E., at altitude 5,500 feet above sea level; flows northward 2½ miles into North Fork of American River (tributary to Sacramento River) half a mile east of the mouth of Granite Creek; fall, 2,000 feet. Colfax sheet.

New York Creek (L); Eldorado County; rises in the southern part of T. 10 N., R. 8 E., at altitude 800 feet above sea level; flows northward 5 miles into South Fork of American River (tributary through American River to the Sacramento) 1 mile below Salmon Falls; fall, 400 feet. Sacramento sheet.

New York Creek (R); Yuba County; rises in the northern part of T. 19 N., R. 6 E., 1 mile northwest of New York Flat, at altitude 2,500 feet above sea level; flows southeastward 2 miles and unites with Slate Creek to form Dry Creek (tributary through Yuba River to Feather River and thus to the Sacramento); fall, 300 feet. Smartsville sheet.

Nigger Jack Slough (L); Yuba County; discharges into Feather River (and thus to the Sacramento) through Simmerly Slough, which it joins just north of Marysville; length, about 8 miles. Marysville sheet.

Nigger Slough; Sacramento County, Rancho del Paso; extends northeastward from a point one-eighth mile north of American River and one-half mile northeast of Sacramento. Brighton sheet.

North Branch or **Fork.** See name of main stream.

North Creek (R); rises in Nevada County, in the southeastern part of T. 18 N., R. 14 E., at altitude 7,200 feet above sea level; flows westward 5 miles into Fordyce Lake (outlet Fordyce Creek to South Fork of Yuba River which flows through Yuba River to Feather River and thus to the Sacramento); fall, 1,300 feet; numerous small tributaries, including stream from White Rock Lake. Truckee sheet.

North Salt Creek. See *Salt Creek, North.*

Norton Gulch Creek (L); rises in Shasta County, in the northeast part of T. 33 N., R. 2 W., at altitude 2,000 feet above sea level; flows southwestward 3 miles into Little Cow Creek (tributary to Cow Creek and thus to the Sacramento); fall, about 950 feet. Redding sheet.

Nosoni Creek (L); rises in Shasta County, in the northwestern part of T. 35 N., R. 2 W., at altitude 2,500 feet above sea level; flows westward about 5 miles into McCloud River (tributary through Pit River to the Sacramento); fall, 1,600 feet; tributary, North Fork. Redding sheet.

Nosoni Creek, North Fork (R); rises in Shasta County, in the southeastern part of T. 36 N., R. 3 W., at altitude 3,000 feet above sea level; flows southwestward 3½ miles into Nosoni Creek (tributary to McCloud River and thus through Pit River to the Sacramento); fall, 1,700 feet. Redding sheet.

Nye Creek (L); rises in Glenn County, in the northeastern part of T. 20 N., R. 6 W.; flows southeastward into the South Fork of Willows Creek (to Colusa Basin); intermittent; about 10 miles long. Sheet B, Sacramento Valley map.

Oak Run (R); rises in Shasta County, in the northwest part of T. 33 N., R. 1 W., at 1,800 feet above sea level; flows southwest to its junction with Cow Creek (tributary to Sacramento River); length, about 21 miles; fall, 1,300 feet. Redding sheet.

Oat Creek (R); rises in Yolo County, in the western part of T. 11 N., R. 2 W.; flows eastward 9 miles, then northeastward 3 miles into Colusa Basin; intermittent. Sacramento Valley map.

Oat Creek (R); rises in Tehama County, in the southeast part of T. 26 N., R. 4 W., about 800 feet above sea level; flows south of east about 16 miles into Sacramento River in eastern part of Las Flores Rancho; fall, 600 feet; intermittent. Tehama sheet.

O'Brien Creek (L); rises in Shasta County, near the central part of T. 34 N., R. 4 W., on the eastern slope of O'Brien Mountain, at altitude 1,500 feet above sea level; takes a circuitous but in general westerly course to the Sacramento in the eastern part of T. 34 N., R. 5 W.; length, about 4 miles; fall, 750 feet. Redding sheet.

Old Cortina Creek. See *Cortina Creek, Old.*

Old Cow Creek. See *Cow Creek.*

Olney Creek (L); rises in Shasta County, in the western part of T. 31 N., R. 5 W., at altitude 1,200 feet above sea level; flows southeastward and then southward; length, about 7 miles; fall, 800 feet, chiefly in upper part of course; intermittent, carrying water to Clear Creek (tributary to Sacramento River), to which its basin is tributary, only in times of flood. Redding sheet.

One Eye Creek (L); rises in Eldorado County, in the northwestern part of T. 11 N., R. 11 E., on the western slope of Slate Mountain, at altitude 3,500 feet above sea level; flows southwestward 3 miles then northwestward 2 miles into Rock Creek (tributary through South Fork of American River to American River and the Sacramento); fall, 1,700 feet. Placerville sheet.

Onemile Creek (R); Glenn and Colusa counties, Larkin Children's ranch; a floodwater channel, about 4½ miles long, extending southwestward into the Colusa Basin from the vicinity of Packer Island to a point 2 miles southwest of Princeton. Sheet C, Sacramento Valley map.

Onion Creek (R); Eldorado County; rises in the eastern part of T. 12 N., R. 13 E., at altitude 5,700 feet above sea level; flows southwestward 4 miles, then somewhat east of south 2 miles into Silver Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 2,200 feet. Pyramid Peak and Placerville sheets.

Onion Creek (R); Placer County; rises in the southwestern part of T. 17 N., R. 15 E., on the west slope of Mount Lincoln (altitude 8,403 feet); flows southwestward 3 miles into North Fork of American River (tributary to Sacramento River); fall, 2,000 feet. Truckee sheet.

Onion Creek (R); Tehama County; rises in the southern part of T. 28 N., R. 4 E., at altitude 4,700 feet above sea level; flows southeastward 2 miles into Deer Creek (tributary to Sacramento River); fall, 600 feet. Lassen Peak sheet.

Onion Valley Creek (R); Placer County; rises in the north-central part of T. 16 N., R. 12 E., at altitude 4,900 feet above sea level; flows south into East Fork of North Fork of North Fork of American River (tributary through North Fork of American and American rivers to the Sacramento); length, 2 miles; fall, 500 feet. Colfax sheet.

Onion Valley Creek (L); Plumas County; rises in the north-central part of T. 22 N., R. 10 E., at altitude 7,000 feet above sea level; flows irregularly westward to its junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 10 miles; fall, 4,000 feet; many short tributaries of which the only one named on the map is Bird Creek. Downieville and Bidwell Bar sheets.

Orchard Creek (L); rises in Placer County, in the southwestern part of T. 12 N., R. 7 E., at altitude 500 feet above sea level; flows north of west 7 miles into Auburn Ravine (tributary through Bunkham Slough to American Basin); fall in 2 miles at head, 300 feet; fall to Auburn Ravine, 400 feet; intermittent. Sacramento sheet.

Oregon Creek; rises in Sierra County, near the center of T. 19 N., R. 10 E., 1 mile north of Forest City, at altitude 5,000 feet above sea level; flows southwestward into Middle Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); length, 16 miles; fall, 3,600 feet. Colfax and Smartsville sheets.

Oregon Gulch Creek (R); Butte County; rises in the northern part of T. 20 N., R. 4 E., 1 mile north of Oregon City, at altitude 1,500 feet above sea level; flows southward into Feather River (tributary to Sacramento River); length, 6 miles; fall, 1,200 feet. Chico sheet.

Oregon Gulch Creek (R); Shasta County; rises in the central part of T. 31 N., R. 5 W., at altitude 800 feet above sea level; flows eastward into Sacramento River 3 miles below Redding; fall, 200 feet; intermittent. Redding sheet.

Oroleave Creek (L); rises in Butte County, in the southeastern part of T. 20 N., R. 7 E., 1 mile south of Clipper Mill, at altitude 3,700 feet above sea level; flows northwestward into South Fork of Feather River (tributary to Middle Fork of Feather River and thus through the Feather to Sacramento River); length, 4 miles; fall, 1,900 feet. Bidwell Bar sheet.

Otter Creek (L); rises in Eldorado County, in the southeastern part of T. 13 N., R. 11 E., near Kentucky Flat, at altitude 4,000 feet above sea level; flows in general somewhat north of west into Middle Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); length, 8 miles; fall, 3,000 feet. Placerville sheet.

Owl Creek (L); Nevada County; rises in the northeastern part of T. 16 N., R. 7 E., at altitude 2,100 feet above sea level; flows northwestward 2 miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 1,100 feet. Smartsville sheet.

Owl Creek (L); Placer County; rises in the northern part of T. 13 N., R. 10 E., at altitude 2,800 feet above sea level; flows somewhat south of west about 3 miles into North Fork of American River (tributary through American River to the Sacramento); fall, 1,900 feet, of which 1,000 feet occurs in ½ mile just above mouth. Colfax sheet.

Owl Gulch Creek (R); rises in Yuba County, in the southeastern part of T. 20 N., R. 8 E., at altitude 3,500 feet above sea level; flows southeastward 2 miles into Deadwood Creek, a tributary of North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 1,000 feet. Bidwell Bar sheet.

Packer Lake; Sierra County, northwestern part of T. 20 N., R. 12 E.; 1 inlet; outlet a stream 2 miles long flowing in general eastward to the stream connecting Lower Salmon Lake with the North Fork of Yuba River (tributary to Yuba River and thus through Feather River to the Sacramento); elevation 6,550 feet; fall of outlet, 600 feet. Called Parker Lake on Punnett's map of Sierra County. Downieville sheet.

Packer Slough (R); Glen County, Larkin Children's ranch, half a mile west of the river; a horseshoe-shaped slough encircling Packer Island. Sheet C, Sacramento Valley map.

Paine Creek (L); rises in Tehama County, in the extreme southwestern part of T. 29 N., R. 3 E., 4,000 feet above sea level; flows somewhat south of west about 27 miles to junction with Sacramento River in T. 28 N., R. 3 W.; fall, 3,700 feet, of which 3,200 feet occurs in upper half of course. Lassen Peak and Red Bluff sheets.

Palisade Creek (R); rises in Placer County, in the southern part of T. 17 N., R. 14 E., in one of the Cascade Lakes, at altitude 6,500 feet above sea level; flows somewhat west of south to its junction with North Fork of American River (tributary through American River to the Sacramento), which it enters near the head of the American River gorge at the east pass of Snow Mountain; length about 4 miles; fall, 1,400 feet. Truckee sheet.

Panther Creek (R); rises in Siskiyou County, on the south slope of Mount Shasta, at altitude 7,600 feet above sea level; flows south and southeast; intermittent in lower course; water sinks into the lava beds at the base of the mountain and reappears as springs tributary to Squaw Creek (tributary to McCloud River, and thus through Pit River to the Sacramento); Shasta sheet.

Parker Creek (L); rises in the southeastern part of Modoc County, on the western slope of Warner Mountains, at altitude 7,500 feet above sea level; flows northwestward 15 miles into North Fork of Pit River, which is tributary through Pit River to the Sacramento; fall, about 3,000 feet. Alturas sheet.

Parker Lake. See *Packer Lake.*

Pats Gulch Creek (L); rises in Sierra County, in the east-central part of T. 21 N., R. 9 E., near Queen City, at altitude 5,000 feet above sea level; flows westward 1½ miles into Slate Creek (tributary to North Fork of Yuba River which flows through Middle Fork of Yuba, Yuba, and Feather rivers to the Sacramento); fall, 800 feet. Downieville sheet.

Peavine Creek (L); rises in Placer County, in the northeastern part of T. 14 N., R. 12 E., at altitude 5,500 feet above sea level; flows southwestward 5½ miles, northwestward 1 mile, and south of west 2 miles into North Fork of Middle Fork of American River (tributary through Middle Fork of American River to North Fork of American River and thus through American River to the Sacramento); fall, 3,500 feet, of which 2,000 feet occurs in 2 miles. Colfax sheet.

Peters Creek (L); rises in Plumas County in the southern part of T. 27 N., R. 11 E., at altitude 7,200 feet above sea level; flows southwestward about 7 miles to junction with Lights Creek (tributary through Indian Creek to North Fork of Feather River and thus through Feather River to the Sacramento); length, about 7 miles; fall, 3,700 feet. Indian Valley special map.

Petroleum Creek (R); rises in Yolo County in the northern part of T. 12 N., R. 3 W.; flows northeastward to Colusa Basin; intermittent. Sheet F, Sacramento Valley map.

Phoenix Lake; Nevada County, southeastern part of T. 18 N., R. 13 E., on north slope of Old Man Mountain; outlet a stream one-half mile long flowing westward to an unnamed southward-flowing stream which discharges into Fordyce Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); elevation, 7,300 feet. Colfax sheet.

Pigeon Roost Canyon Creek (R); rises in Placer County, in the southwestern part of T. 13 N., R. 13 E., at altitude 4,400 feet above sea level; flows southwestward 2 miles into Rubicon River (tributary through Middle Fork of American River to North Fork of American River and thus through American River to the Sacramento); fall, 1,800 feet. Placerville sheet.

Pilot Creek (L); rises in Eldorado County, in the northwestern part of T. 11 N., R. 9 E., on Pilot Hill, at altitude 1,600 feet above sea level; flows in general northwestward into North Fork of American River (tributary through American River to the Sacramento); length, about 3 miles; fall, 1,300 feet. Sacramento sheet.

Pilot Creek (L); rises in Eldorado County, in the southeastern part of T. 13 N., R. 13 E., at altitude 5,700 feet above sea level; flows southwestward 5 miles, westward 4 miles, northward 6 miles, then east of north 1½ miles into Rubicon River (tributary through Middle Fork of American River to North Fork of American River and thus through American River to the Sacramento); length, about 16 miles; fall, 3,300 feet. This creek closely parallels the great southward bend of the Rubicon, at an average distance of less than 2 miles. Placerville sheet.

Pine Creek (R); Modoc County; southeastern part; rises on the western slope of Warren Peak, Warner Mountains, at altitude 7,000 feet above sea level; flows northwesterly about 16 miles to its junction with South Fork of Pit River (tributary, through Pit River, to the Sacramento); fall, approximate, 2,500 feet. Alturas sheet.

Pine Creek (L); Plumas County; rises in the northwestern part of T. 24 N., R. 6 E., at altitude 6,000 feet above sea level; flows southward 5 miles into Rock Creek (tributary through North Fork of Feather River to Feather River and the Sacramento); fall, 3,700 feet. Bidwell Bar sheet.

Pine Creek (R); Plumas County; rises in the southern part of T. 25 N., R. 11 E., on the south slope of Grizzly Mountain (altitude 7,500 feet above sea level); flows southward 5 miles then westward 2 miles into Spring Garden Creek (tributary to Spanish Creek and thence through Indian Creek to the North Fork of Feather River to Feather River and into the Sacramento); tributary, Squirrel Creek; fall, 3,700 feet, of which 2,500 feet occurs in the first 4 miles. Downieville sheets.

Pine Creek (L); rises in eastern Tehama County, in the southeastern part of T. 25 N., R. 2 E., about 3,000 feet above sea level; flows southwestward 19 miles, then very irregularly southward 6 miles into Sacramento River; total fall, 2,890 feet, of which 2,600 feet occurs in the first 12 miles of course; tributaries, Camel, Singer, and Rock creeks, and many smaller intermittent streams; intermittent below foothill region; connected with Mud Creek by Kusal Slough. Chico and Vina sheets.

Pine Timber Gulch Creek (L); rises in Shasta County, in the western part of T. 31 N., R. 1 W., at altitude 1,600 feet above sea level; flows northwestward 2 miles into South Fork of Cow Creek (tributary through Cow Creek to Sacramento River); fall, 300 feet; intermittent. Redding sheet.

Pinkard Creek (R); Butte County; rises in the northwestern part of T. 20 N., R. 8 E., at altitude 3,800 feet above sea level; flows southwestward 3 miles into Lost Creek (tributary to South Fork Feather River and thus through Middle Fork Feather and Feather River to the Sacramento); fall, 800 feet. Bidwell Bar sheet.

Pinkard Creek (L); Plumas County; rises in the southwestern part of T. 22 N., R. 8 E., on the west slope of Cammel Peak, at altitude 5,000 feet above sea level; flows somewhat south of west to junction with South Branch of Middle Fork of Feather River (tributary through Feather River to the Sacramento); length, 5 miles; fall, 1,200 feet. Bidwell Bar sheet.

Pit River (L); formed near Alturas, in Modoc County, by union of North and South forks (q. v.); takes a general southwesterly course to its junction with Sacramento River about 12 miles north of Redding; elevation at lturas, about 4,500 feet; elevation at mouth, 687 feet; fall, 3,813 feet; fall between head of South Fork and mouth of main stream, about 7,300 feet; principal tributaries, Fall River, Squaw Creek, and McCloud River, from the north (right), and West Valley, Hat, Beaver, Ash, and Burney creeks from the south (left); drainage area, including Goose Lake basin, approximate, 6,290 square miles, or 22 per cent of the total area of the Sacramento River basin.

The greater part of the basin of Pit River exceeds 4,000 feet in elevation and consists chiefly of barren lava beds in the north and numerous small, flat, marshy meadows in the south. The area contains also many volcanic buttes and peaks, of which Mount Shasta (14,380 feet above sea level) and Lassen Peak (elevation, 10,437 feet) are the most important and are shared in common ·ith the upper Sacramento and Feather river basins.

About 50 per cent of the Pit basin is devoid of forest, the timberless area lying chiefly in the northeastern part. There are two well forested areas—one south of the Pit and north of Lassen Peak, and the other north of the Pit and south of Mount Shasta extending westward from Fall River and including the McCloud basin. All the public land in the forested area is included in Federal forest reserves.

Precipitation in this basin ranges from 10 inches annually in the upper eastern part, where it occurs largely as snow which at moderate altitudes soon melts, to 75 inches in the western and northwestern parts.

Numerous reservoir sites on the upper Pit and its tributaries have been surveyed by the United States Reclamation Service. The basin also affords exceptional opportunities for power development, especially below Fall River Mills. It is estimated

that the Pit and its tributaries could develop about 1,000,000 horsepower continuously. About 50 per cent of this amount is commercially feasible of development and only about 2 per cent has been developed.

Gaging stations near Canby (1904–5), Bieber (1904–08), Henderson (1910–1911), and Silverthorne Ferry (1910–11).

Alturas, Modoc Lava Bed, Lassen Peak, Red Bluff, and Redding sheets.

Pit River, North Fork (R); rises in eastern Modoc County, about half a mile south of Goose Lake (q. v.), at altitude 4,800 feet above sea level; flows irregularly southward about 16 miles to Alturas, where it unites with the South Fork to form Pit River, which flows into the Sacramento; fall, about 250 feet; principal tributaries, Swedrengen, Joseph, and Parker creeks. Alturas sheet.

Topographically Goose Lake belongs to the drainage of the North Fork of the Pit, but normally it discharges no water to the river. It is said that in 1881, during a severe storm from the north, it overflowed to the river for two hours.

Pit River, South Fork (L); rises in Modoc County, on the western slope of Warner Mountains, about half way between Warren and Eagle peaks, at altitude 8,000 feet above sea level; flows southwestward 10 miles, passing through Clear Lake, then westward about 10 miles, then turns and flows northward through a swampy valley to Alturas, where it unites with the North Fork to form Pit River, through which it is tributary to the Sacramento; length, about 36 miles; fall, 3,550 feet, of which 3,400 feet occurs in the first 15 miles of course; principal tributaries, West Valley (Clark) Fitzhugh, and Pine creeks. Gaging station near Ivy, 1904–5. Alturas sheet.

On Starkweather's map of Lassen County the name "South Fork of Pit River" is applied to the stream flowing northward from the south base of South Fork Peak.

Pleasant Grove Creek (L); rises in Placer County, in the northwestern part of T. 11 N., R. 7 E., at altitude 500 feet above sea level; flows very irregularly westward about 12 miles into American Basin, 1½ miles south of Pleasant Grove station; intermittent; channel tortuous. Roseville, Pleasant Grove, and Vernon sheets.

Pleasant Grove Creek, South Branch (L); rises in Placer County, in the southeastern part of T. 11 N., R. 6 E., 1 mile north of Roseville, at altitude 175 feet above sea level; flows northwestward to Pleasant Grove Creek (tributary to American Basin; length, about 4 miles; fall, 75 feet; intermittent. Roseville sheet.

Pleasant Lake, Eldorado County. See *Loon Lake.*

Pleasants Creek (R); rises in Solano County, in the southeastern part of T. 7 N., R. 2 W., at altitude 425 feet above sea level; flows somewhat east of north about 5 miles into Putah Creek (tributary to Yolo Basin); flows through Pleasants Valley; tributary, Miller Canyon Creek. Napa sheet.

Plum Creek (L); rises in Eldorado County, in the eastern part of T. 10 N., R 14 E., at altitude 5,900 feet above sea level; flows northwestward 6 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 2,700 feet. Pyramid Peak sheet.

Plumas Lake; Yuba County, southwestern part of T. 14 N., R. 4 E., just west of Feather River; a slough-like lake which receives the drainage from Reeds Creek and other intermittent streams south of the mouth of Yuba River and north of Dry Creek. An arm of this lake called Messick Lake extends northwestward from a point near its western end. The lake is exceedingly irregular in shape. Ostrom sheet.

Poorman Creek (L); in Nevada County; rises in the eastern part of T. 15 N., R. 9 E., at altitude 2,900 feet above sea level; flows southwestward 2 miles into Greenhorn River (tributary through Bear River to Feather River and thus to the Sacramento); fall, 800 feet. Colfax sheet.

Poorman Creek (R); Nevada County; rises in the northeastern part of T. 18 N., R. 11 E., at altitude 6,500 feet above sea level; flows southwestward 10 miles to junction with South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 4,000 feet. Colfax sheet.

Poorman Creek (L); Plumas County; rises in the northern part of T. 22 N., R. 10 E., at altitude 6,500 feet above sea level; flows northeastward into Nelson Creek (tributary through Middle Fork of Feather River to the Sacramento); fall, 2,100 feet. Downieville sheet.

Pope Creek (R); rises in Napa County in the southwestern part of T. 10 N., R. 6 W.; flows somewhat south of east about 16 miles into Putah Creek (tributary to Yolo Basin); Punnett's map of Napa County.

Poplar Creek (L); rises in Plumas County, in the southwestern part of T. 23 N., R. 11 E., at altitude 6,300 feet above sea level; takes a general northeasterly course into Middle Fork of Feather River (tributary through Feather River to the Sacramento) 2 miles west of Cromberg; length, about 5 miles; fall, 2,600 feet, of which 1,800 feet occurs in about three-fourths mile at head; tributaries Little Poplar and Camp creeks. Downieville sheet.

Poplar Creek, Little (R); rises in Plumas County, in the northern part of T. 22 N., R. 11 E., at altitude 5,700 feet above sea level; flows irregularly northward to its junction with Poplar Creek (tributary through Middle Fork of Feather River to Feather River and the Sacramento); length, 2 miles; fall, 1,200 feet. Downieville sheet.

Potem Creek (R); rises in Shasta County, in the northern part of T. 35 N., R. 2 W., on the north slope of Brock Butte, at altitude 2,800 feet above sea level; flows northeastward 2 miles, then southeastward 5½ miles to its junction with Pit River (tributary to Sacramento River); fall, 1,800 feet. Redding sheet.

Potter Creek (L); rises in Shasta County, in the eastern part of T. 34 N., R. 4 W., on the western slope of Horse Mountain, at altitude 2,000 feet above sea level; flows southwestward into McCloud River (tributary through Pit River to the Sacramento) at Baird; length, 1½ miles; fall, 1,300 feet. Redding sheet.

Poverty Gulch Creek (L); rises in Shasta County, in the central part of T. 29 N., R. 7 W., about 1,200 feet above sea level; flows southeastward 3 miles into Middle Fork of Cottonwood Creek (tributary through Cottonwood Creek to the Sacramento); fall, about 400 feet. Red Bluff sheet.

Powderhorn Creek (L); rises in Placer County, in the northwestern part of T. 14 N., R. 16 E., at altitude 8,000 feet above sea level; flows northwestward about 2½ miles into Five Lakes Creek (tributary to Rubicon River and thus through Middle Fork of American River to North Fork of American, American, and Sacramento rivers); fall, 1,500 feet. Truckee sheet.

Powell Creek (L); rises in Butte County, in the eastern part of T. 19 N., R. 5 E., at altitude 1,500 feet above sea level; flows northward 3 miles into South Fork of Feather River (tributary to Middle Fork of Feather and thus through Feather River to the Sacramento); fall, 900 feet. Bidwell Bar sheet.

Powell Slough; Colusa County, extends from a point 2 miles west of Colusa southeastward about 5 miles. A northeastern arm is called Hopkins Slough. Sheets D and E, Sacramento Valley map.

Prairie Creek (L); rises in Yuba County, in the southeastern part of T. 17 N., R. 5 E., at altitude 300 feet above sea level; flows westward into South Honcut Creek (tributary through Honcut Creek to Feather River and thus to the Sacramento); length, 8 miles; fall, about 200 feet. Smartsville and Marysville sheets.

Price Hollow Creek (L); rises in Shasta County, in the southeastern part of T. 33 N. R. 2 W., at altitude 1,400 feet above sea level; flows southwestward 3 miles into Cow Creek (tributary to Sacramento River); fall, about 800 feet; intermittent. Redding sheet

Prospect Slough; Yolo Basin, west of Miner Slough and east of Shag Slough, a branch of Cache Slough. Sacramento Valley map.

Putah Creek (R); rises in the St. Helena Range, on the eastern slope of the Coast Range, in the northern part of T. 11 N., R. 7 W.; flows southeastward into Yolo Basin near Davis; length about 80 miles; basin long and narrow, being 20 miles wide at

the north end and less than 10 miles wide at the east; drainage area, 810 square miles; tributaries discharge heavily during floods but are practically dry during the summer; principal tributaries, Soda Creek from the north and Pope Creek from the west.

The basin includes the southern part of Lake County, the northern half of Napa and small parts of Yolo and Solano counties. The topography of the basin is very rugged. Altitudes range from about 100 feet in Sacramento Valley to about 5,000 feet on the mountain slopes. The lower parts of the area are comparatively barren of timber, though they support a considerable growth of grass and brush which extends down as far as the foothills. At lower elevations timber grows scatteringly and the mountain summits are covered by a fairly heavy timber growth.

Mean annual precipitation averages about 28 inches along the foothills, 40 inches in the central part, and about 65 inches along the crest of the divide, where some of it occurs as snow. The annual precipitation at Helen Mine, on the northern slope of Mount St. Helena, is almost 100 inches annually.

Below the foothills is a large area of rich irrigable land. At least two good reservoir sites exist on the main stream, one near Winters and the other near Guenoc. Only a small amount of power could be developed continuously in the basin without storage because of the torrential nature of the streams. By utilizing the storage sites, however, many thousand horsepower can be developed.

Surveys and data: Punnett's maps of Mendocino and Lake counties, Sacramento Valley map.

Putah Creek Sinks; Yolo Basin, 6 miles southwest of Sacramento, a marshy area which receives the waters from Putah Creek. Sheet L, Sacramento Valley map.

Putah Creek, South Fork; Yolo Basin, not a tributary of Putah Creek but the south channel through which the waters of the creek enter Putah Creek Sinks. Sheet L, Sacramento Valley map.

Ramshorn Creek (R); rises in Sierra County, in the southwestern part of T. 20 N., R. 10 E., at altitude 5,000 feet above sea level; flows southward 2 miles into North Fork of Yuba River (tributary to Middle Fork of Yuba, and thus through Yuba and Feather rivers to the Sacramento); fall, 2,300 feet. Downieville sheet.

Rancheria Creek (L); rises in Shasta County, in the western part of T. 33 N., R. 4 W., on the south slope of Bass Mountain, at altitude 1,500 feet above sea level; flows southward into Moody Creek (tributary to West Fork of Stillwater Creek and thus through Stillwater Creek to the Sacramento); length, 2 miles; fall, 700 feet; intermittent. Redding sheet.

Randolph Canyon Creek (R); rises in Eldorado County, in the northern part of T. 10 N., R. 11 E., near Oak Grove, at altitude 2,500 feet above sea level; flows westward 1 mile and southwestward 2 miles into Hangtown Creek (tributary through Webber Creek to South Fork of American River and thus through American River to the Sacramento) at Placerville; fall, 800 feet. Placerville sheet.

Randolph Canyon Creek (L); rises in Eldorado County, in the southwestern part of T. 11 N., R. 13 E., at altitude 4,200 feet; flows northwestward 1 mile into South Fork of American River (tributary through American River to the Sacramento); fall, 1,700 feet. Placerville sheet.

Rasor Lakes; Glenn County, Larkin Children's ranch; six small intermittent water bodies lying between the channels of Willows and Bounde creeks. Sheet C, Sacramento Valley map.

Rasor Slough; Glenn County, Larkin Children's ranch, three-fourths mile west of the Sacramento and one-half mile north of Packer Slough. Sheet C, Sacramento Valley map.

Rattlesnake Creek (R); Modoc County, northern part; rises on the east slope of Timbered Mountain, at altitude (approximate) 5,300 feet above sea level; flows southeasterly into Pit River, a tributary of the Sacramento; length, about 20 miles; fall, 750 feet; intermittent in upper 16 miles of course. Alturas sheet.

Rattlesnake Creek (L); Nevada County; rises in the northeastern part of T. 15 N., R. 8 E., at altitude 2,600 feet above sea level; flows southwestward into Wolf Creek (tributary through Bear Creek to Feather River and thus to the Sacramento); length, about 5 miles; fall, 900 feet. Smartsville sheet.

Rattlesnake Creek (R); Nevada County; rises in the northwestern part of T. 17 N., R. 14 E., at altitude 7,500 feet above sea level; flows southwestward into South Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento); length, 6 miles; fall, 1,800 feet. Truckee and Colfax sheets.

Rattlesnake Creek (R); Plumas County; rises in the southeastern part of T. 24 N., R. 11 E., on the south slope of Grizzly Mountain, at altitude 6,200 feet above sea level; flows southwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento) just below the mouth of Long Valley Creek; length, 4 miles; fall, 2,100 feet. Downieville sheet.

Rattlesnake Creek (L); Sierra County; rises in the eastern part of T. 20 N., R. 10 E., on the south slope of Rattlesnake Peak, at altitude 6,500 feet above sea level; flows southwestward into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba to Middle Fork of Yuba, and thus through Yuba River to Feather River and the Sacramento), Downieville branch; length, 4 miles; fall, 2,300 feet. Downieville sheet.

Rattlesnake Creek (L); Tehama County; rises in the northern part of T. 24 N., R. 1 E., on the southern slope of Camel Mound, at altitude 2,000 feet above sea level; flows southwestward about 8 miles into Singer Creek (tributary to Pine Creek and thus to the Sacramento); fall, 1,700 feet, of which 1,300 feet occurs in the first 4 miles of course. Chico sheet.

Read Creek (R); rises in Tehama County, in the southern part of T. 27 N., R. 6 W., at altitude 1,000 feet above sea level; flows eastward and enters Sacramento River just below Red Bluff; length, 20 miles; fall, 700 feet; principal tributary, North Fork; lower course intermittent. Red Bluff and Tehama sheets.

Read Creek, North Fork (L); rises in Tehama County, in the eastern part of T. 27 N., R. 6 W., at altitude 900 feet above sea level; flows southeastward 7 miles into Read Creek (tributary to Sacramento River); fall, 500 feet. Red Bluff and Tehama sheets.

Red Bank Creek (R); rises in Tehama County, in the northern part of T. 25 N., R. 8 W., on the eastern slope of Yolla Bolly Mountains, at altitude 2,000 feet above sea level; flows somewhat north of east about 30 miles to junction with Sacramento River 2 miles below Red Bluff; fall, 1,700 feet; intermittent in lower course. Red Bluff and Tehama sheets.

Redbird Creek (R); rises in Eldorado County, in the eastern part of T. 11 N., R. 11 E., at altitude 2,900 feet above sea level; flows west of south 2 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 1,200 feet. Placerville sheet.

Red Clover Creek (L); rises in Plumas County, in the southwestern part of T. 24 N., R. 15 E., at altitude 7,100 feet above sea level; flows northwestward through Red Clover Valley to its junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thence to the Sacramento); length, about 18 miles; fall, 3,400 feet; principal tributaries, Dixie and Squaw Queen creeks. Sierraville, Downieville, Honey Lake, and Indian Valley special sheets.

Reeds Creek (L); rises in Yuba County, in the northeastern part of T. 15 N., R. 5 E., at altitude 300 feet above sea level; flows southwestward into Plumas Lake whose waters are connected with Feather River only when the latter overtops the confining levees. The creek is about 18 miles long and its fall of 260 feet occurs almost entirely in the upper 6 miles; intermittent. Smartsville and Marysville sheets; also Wheatland and Ostrom sheets.

Refuge Canyon Creek (R); rises in Placer County, in the northern part of T. 14 N., R. 10 E., at altitude 2,800 feet above sea level; flows southward into New York Canyon Creek (tributary to North Fork of American River and thus through American River to the Sacramento); fall, 900 feet. Colfax sheet.

Rice Creek (R); rises in Tehama County, in T. 23 N., R. 6 W.; flows eastward; intermittent; water sinks in Capay Rancho, a mile or more west of the Sacramento. Vina sheet.

Ringgold Creek (L); rises in Eldorado County, in the south-central part of T. 10 N., R. 11 E., at altitude 2,500 feet above sea level; flows southwestward 1½ miles, then northwestward 2 miles into Webber Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 1,100 feet. Placerville sheet.

Rio de los Berrendos (L); rises in Tehama County, in the southwestern part of T. 27 N., R. 1 E., at altitude 1,800 feet above sea level; flows southwestward about 13 miles to Antelope Creek (tributary to the Sacramento); fall, 1,600 feet, of which 1,450 feet is in upper 9 miles; intermittent; tributary, Wildcat Creek. Tehama sheet.

Ripgut Creek. See *Lick Creek.*

Roaring River (R); rises in Shasta County, in the southwestern part of T. 30 N., R. 7 W., at altitude 4,000 feet above sea level; flows southward 4 miles, then southeastward 12 miles into North Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River); fall, 3,200 feet; principal tributary, Crow Creek. Red Bluff sheet.

Rock Bound Lake; Eldorado County, in the northwestern part of T. 13 N., R. 16 E.; one inlet; outlet a stream one-fourth mile long flowing westward into Buck Island Lake (outlet to Rubicon River and thus through Middle Fork of American and American rivers to the Sacramento); elevation above sea level, 6,550 feet; above Buck Island Lake, 150 feet. Pyramid Peak sheet.

Rock Creek (L); Butte County; rises in the southwestern part of T. 22 N., R. 5 E., at altitude 3,200 feet above sea level; flows southward 2 miles into North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,400 feet. Bidwell Bar sheet.

Rock Creek (L); Butte County; rises near the Butte-Tehama County boundary, in T. 25 N., R. 2 E., on the west slope of Keefer Ridge, at altitude 3,700 feet above sea level; flows southwestward about 22 miles into Pine Creek (tributary to the Sacramento); fall, 3,300 feet, of which 2,200 feet occurs in the first 6 miles of course and 1,000 feet more in the next 5 miles; intermittent below the foothill region. Chico sheet.

Rock Creek (R); Eldorado County; rises in the southern part of T. 13 N., R. 11 E., at altitude 3,500 feet above sea level; flows southward 8 miles, southwestward 2½ miles, then southeastward again 2 miles into South Fork of American River (tributary through American River to the Sacramento); length, 13 miles; fall, 2,200 feet; principal tributaries, Whaler Creek and West Fork of Rock Creek. Placerville sheet.

Rock Creek (R); Nevada County; rises in the northwestern part of T. 14 N., R. 7 E., at altitude 1,400 feet above sea level; flows southwestward 8 miles into Bear River (tributary through Feather River to the Sacramento); fall, 1,100 feet. This is the lowest tributa y received by the Bear from the foothills. Smartsville sheet.

Rock Creek (L); Nevada County; rises in the southeastern part of T. 17 N., R. 9 E., at altitude 3,900 feet above sea level; flows irregularly westward into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); length, 8 miles; fall, 2,400 feet. Colfax and Smartsville sheets.

Rock Creek (L); Placer County; rises in the southern part of T. 12 N., R. 7 E., at altitude 325 feet above sea level; flows north of west about 6 miles into Auburn Ravine (tributary through Bunkham Slough to American Basin); intermittent; channel very tortuous; fall, about 225 feet. Roseville sheet.

Rock Creek (R); Plumas County; rises near the center of T. 25 N., R. 5 E., on the north slope of Table Mountain, at altitude 6,000 feet above sea level; flows southeastward about 8 miles into North Fork of Feather River (tributary through Feather River to the Sacramento); fall, about 4,300 feet; tributaries North Valley Creek and Pine Creek. Bidwell Bar sheet.

Rock Creek (R); Plumas County; rises in Echo Lake, in the southern part of T. 30 N., R. 7 E., at altitude 6,000 feet above sea level; takes a general southeasterly course to junction with Hamilton Branch of Feather River (tributary through North Fork of Feather River to the Sacramento). Lassen Peak sheet.

Rock Creek (R); Plumas County; formed in the southwestern part of T. 24 N., R. 9 E., by union of North and South forks, of which the South Fork may be considered the head of the main stream. The South Fork rises in the northern part of T. 23 N., R. 9 E., at altitude 6,000 feet above sea level; flows southwestward 3 miles, then west of north to the junction. Below the mouth of the North Fork the general course of the creek is northward until it enters Spanish Creek (tributary to Indian Creek and thence through the North Fork of Feather River to Feather River and into the Sacramento); length to head of South Fork, about 9 miles; fall, 2,500 feet. The South Fork passes through Dean Valley reservoir. Bidwell Bar and Downieville sheets.

Rock Creek (L); Shasta County; rises in the northeastern part of T. 30 N., R. 3 E., at altitude 7,000 feet above sea level; flows westward 12 miles into North Fork of Battle Creek (tributary through Battle Creek to Sacramento River); fall, about 4,600 feet, of which 3,600 feet occurs in the first 4 miles at head. Lassen Peak sheet.

Rock Creek (R); Shasta County; rises in the eastern part of T. 32 N., R. 6 W., at altitude 1,000 feet above sea; flows southeastward into Sacramento River 3 miles above Redding; fall, 500 feet. Redding sheet.

Rock Creek (R); Shasta County; rises in the southwestern part of T. 38 N., R. 3 E., at altitude 5,200 feet above sea level; flows southeastward 7 miles into Pit River (through which it is tributary to Sacramento River) 4 miles below Pecks; fall, 2,700 feet. Modoc Lava Bed sheet.

Rock Creek (L); Sierra County; rises in the eastern part of T. 19 N., R. 10 E., at altitude 5,400 feet above sea level; flows northwestward into North Fork Yuba River (tributary through Middle Fork Yuba to Yuba River, and thus through Feather River to the Sacramento) at Goodyears Bar; length, 6 miles; fall, 2,800 feet; tributary, Woodruff Creek; gaging station at Goodyears Bar, 1910–11. Downieville sheet.

Rock Creek (R); Sierra County; rises in the northwestern part of T. 20 N., R. 9 E., at altitude 5,000 feet above sea level; takes a very irregular but in general southwesterly course to its junction with Canyon Creek (tributary to North Fork of Yuba River through Middle Fork of Yuba, Yuba, and Feather rivers to the Sacramento); length 6 miles; fall, 2,300 feet. Downieville and Bidwell Bar sheets.

Rock Creek, Little (L); Butte County; rises in the southwestern part of T. 24 N., R. 5 E., at altitude 4,500 feet above sea level; flows southwest 2 miles, then north of west 2 miles, into Kimshew Creek (tributary to West Branch of Feather River and thus through North Fork of Feather River and Feather River to the Sacramento); fall, 1,800 feet. Bidwell Bar sheet.

Rock Creek, North Fork (R); Plumas County; rises in the southern part of T. 24 N., R. 9 E., at altitude 5,200 feet above sea level; flows westward about 4 miles, unites with South Fork to form Rock Creek (tributary to Spanish Creek and thence through Indian Creek to the North Fork of Feather River, Feather River, and the Sacramento); fall, 1,000 feet. Downieville and Bidwell Bar sheets.

Rock Creek, West Fork (R); Eldorado County; rises in the northwestern part of T. 12 N., R. 11 E., at altitude 3,000 feet above sea level; flows irregularly southward 8 miles into Rock Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 1,300 feet; tributaries Bear and Traverse creeks. Placerville sheet.

Rocky Honcut Creek. See *Honcut Creek, Rocky.*

Rodeo Creek (R); rises in Tehama County, in T. 25 N., R. 3 W., on Kimball Plains, at altitude 300 feet above sea level; flows eastward about 3 miles into Saucos Rancho; water sinks about 1 mile west of Tehama; intermittent. Tehama sheet.

Round Tent Canyon Creek (L); rises in Eldorado County, in the eastern part of T. 11 N., R. 13 E., at altitude 4,500 feet above sea level; flows north of west 3 miles into Silver Creek (tributary through South Fork American River to American River and thus to the Sacramento); fall, 1,400 feet. Placerville sheet.

Round Valley Reservoir; Plumas County, T. 26 N., R. 9 E.; several small inlets; outlet, North Canyon Creek to Wolf Creek (tributary through Indian Creek to North Fork of Feather River and thence through Feather River to the Sacramento); altitude, 4,480 feet; 1½ miles long, one-half mile wide. Indian Valley special map.

Rubicon River (L); rises in Eldorado County, in the eastern part of T. 12 N., R. 16 E., 2 miles north of Pyramid Peak, at altitude 8,700 feet above sea level; flows northwestward for about 20 miles in a broad open valley, then southwest in a deep narrow canyon to the northeast corner of T. 14 N., R. 14 E., then northwestward again to its junction with the Middle Fork of American River (tributary through North Fork of American to American River and thus to the Sacramento) in the northern part of T. 13 N., R. 11 E.; including its major windings this river is nearly 50 miles long; forms the boundary between Placer and Eldorado counties; fall, 6,500 feet, an average of more than 130 feet per mile for the entire course. Pyramid Peak, Truckee and Placerville sheets. See also Pyramid Peak folio (No. 31), Geol. Atlas U. S., U. S. Geol. Survey, 1896.

Rubicon River, Little South Fork (L); rises in Eldorado County, in the southeastern part of T. 13 N., R. 16 E., at altitude 8,000 feet above sea level; flows in general south of west into Rubicon River (tributary through Middle Fork of American to North Fork of American and thus through American River to the Sacramento); length, about 13 miles; fall, about 4,400 feet; principal tributary Gerlé Creek, the outlet of Loon Lake. The upper part of these drainage basins contain many small glacial lakes. Truckee and Pyramid Peak sheets.

Rucker Lake; Nevada County, northwestern part of T. 17 N., R. 12 E.; outlet a stream 1½ miles long flowing southwestward into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); elevation, 5,450 feet above sea level; fall of outlet, 1,950 feet, of which 1,500 feet occurs in about three-fourths mile at the mouth. Colfax sheet.

Rush Creek (L); rises in Nevada County, in the northeastern part of T. 16 N., R. 8 E., about 2 miles west of Nevada City, at altitude 2,500 feet above sea level; flows northwestward 3½ miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 1,400 feet. Smartsville sheet.

Sabine Lake; Colusa County, 1¼ miles north of Colusa, one-half mile west of the river at Cobbs Bend; no outlet; elevation about 50 feet. Sheet D, Sacramento Valley map.

Sacramento Basin; east side of Sacramento River above the river delta and south of Sacramento city.

The basin is long and narrow and has been protected from annual inundation better than other portions of the submerged plains adjacent to Sacramento River. A ridge of relatively high ground approaching Sacramento River from the northeast at Freeport cuts it into upper and lower sections. About 35 square miles of the lower portion of this basin is less than 10 feet above low water of Suisun Bay and lies 10 to 15 feet lower than the elevation of extreme high water in the river channel. Through this depression by way of a drainage ditch to Snodgrass Slough, drainage waters from Sacramento City are delivered into branches of San Joaquin River and through this river into Suisun Bay.

Sacramento Valley map. Report of Examining Commission on Rivers and Harbors to the Governor of California (C. T. Reed, C. E. Grunsky, J. J. Crawford, commissioners), Sacramento, 1890, pp. 63–64.

Sacramento River; rises in the southwest part of Siskiyou County, in the small lake on Mount Eddy, one of the peaks of Trinity Mountains, at altitude 6,600 feet above sea level; flows eastward 12 miles, then southward 370 miles to the head of Suisun Bay, 50 miles from San Francisco, where it unites with the San Joaquin; the combined waters pass westward through Carquinez Strait to San Pablo Bay, thence through San Francisco Bay and the Golden Gate to the Pacific Ocean.

The drainage area of the Sacramento comprises 27,100 square miles and is divisible, according to the elevation, into three parts—(1) the central region known as the Sacramento Valley, whose general elevation is less than 500 feet above sea level; (2) the foothill region, made up of hills and ridges ranging in altitude from 500 to 2,300 feet and cut by ravines and canyons of moderate depth; (3) the mountain region, in which altitudes exceed 2,300 feet.

The mountain ranges surrounding the basin belong to the Cordilleran system. The Sierra Nevada on the east has an average width of approximately 70 miles from the rim of the valley to the crest of the range, which lies only a few miles west of the eastern boundary of the State. This range terminates in Warner Mountains in the northeastern part of the State, a region presenting evidence of recent volcanic action. The western slope of the range is covered with vast beds of lava. In the vicinity of Mount Shasta and Lassen Peak, which are themselves the cones of extinct volcanoes, are many cones, craters, ashes, and lakes. To the west of the basin is the Coast Range, which has an average width of approximately 35 miles from the rim of the valley to the crest.

The Sacramento is joined by numerous tributaries from the east and the west. Those coming from the Sierra Nevada, of which the most important are Pit, Feather, and American rivers, flow almost southwest; those from the Coast Range flow, in general, eastward. Most of the streams from the Coast Range do not reach the Sacramento directly but become lost "in the intricate plexus of sloughs which meander through the tule lands bordering the main river. On the east also only the larger tributaries reach the Sacramento by a definite channel and often that is exceedingly tortuous." [1]

Of the total fall of the river—6,600 feet from source to sea level—5,913 feet occurs in the 56 miles above the mouth of Pit River and 447 feet more in the 67 miles between Pit River and Red Bluff, leaving only 240 feet of fall for the remaining 250 miles of course.

Above the mouth of Pit River the Sacramento is a comparatively small stream, flowing swiftly in a well-defined channel; below the Pit it becomes larger, and at Red Bluff, where it enters Sacramento Valley, it is a sluggish stream of small slope and small capacity. It is navigable to Red Bluff, 250 miles above its mouth.

Below the mouth of Stony Creek, throughout a large part of its course, the Sacramento occupies a ridge 5 to 20 feet higher than the troughs of the nearly parallel flood basins on each side, which are 2 to 7 miles from the river. The channel capacity throughout this distance is less than one-third that necessary to carry ordinary floods. The levees that have been constructed to lessen or prevent overflow all fail at one or more places during extreme floods and some fail during ordinary floods.

The large overflow area on the west side of the Sacramento is divided into two basins—Colusa Basin on the north and Yolo Basin on the south—by a ridge of detritus brought down by Cache Creek. The flood area on the east side of the river is divided into four basins—called, from north to south, Butte, Sutter, American, and Sacramento—by Marysville Buttes and Feather and American rivers.

Gaging stations at Castella (1910), Antler (1910), Jellys Ferry, near Red Bluff (1895–1902), Iron Canyon near Red Bluff (1902–1910), Collinsville (1878–1885), and Sacramento (1904–1905).

[1] Ransome, F. L., The Great Valley of California: Bull. Univ. California, vol. 1, 1893–1896, p. 379.

Surveys and data: Topographic maps of the United States Geological Survey, and county maps of northern California, listed on page 3. Description abstracted from "Water resources of California, Part 1, Stream measurements in Sacramento River basin," Water-Supply Paper U. S. Geol. Survey No. 298.

Sacramento River, Middle Fork (L); rises in southern Siskiyou County, in the southwestern part of T. 40 N., R. 5 W., on the eastern slope of Trinity Mountains, 4 miles south of Mount Eddy, at elevation (approximate) 6,600 feet above sea level; flows eastward about 5 miles to its junction with Sacramento River; fall, 3,000 feet. Shasta sheet (on which it is not named); Punnett's map of eastern part of Siskiyou County (1909).

Sacramento River, North Fork (L); rises in southern Siskiyou County, in the northwestern part of T. 40 N., R. 5 W., on the eastern slope of Mount Eddy; flows southeastward about 5 miles to its junction with Sacramento River; a mountain torrent. Punnett Brothers' map of eastern part of Siskiyou County (1909).

Sacramento Slough; Sutter Basin, Sutter County; extends from Sacramento River at a point one-half mile west of the mouth of Feather River, irregularly northwestward a distance of 5 miles. Knights Landing sheet.

Sailor Ravine Creek (L); Placer County; rises in the northwestern part of T. 15 N., R. 14 E., at altitude 6,500 feet above sea level; flows west and then north into North Fork of American River (tributary to Sacramento River) opposite the west base of Snow Mountain; length, 4 miles; fall, 3,000 feet. Truckee and Colfax sheets.

Sailor Ravine Creek (R); Sierra County; rises in the central part of T. 20 N., R. 10 E., at altitude 5,000 feet above sea level; flows eastward 2 miles into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba to Middle Fork of Yuba, and thus through Yuba River to Feather River and the Sacramento) Downieville branch; fall, 1,800 feet. Downieville sheet.

Sailors Ravine Creek (R); rises in Placer County, in the eastern part of T. 13 N., R. 7 E., at altitude 1,200 feet above sea level; flows north of west 2 miles, then southwest 2 miles into Doty Creek (tributary through Coon Creek to American Basin); fall, 800 feet, intermittent. Sacramento sheet.

Salmon Lakes, Upper and Lower; Sierra County, south-central part of T. 21 N., R. 12 E.; 2 small inlets; connected by a very short stream; outlet a stream 4 miles long, flowing southward to North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); elevation of upper lake 6,650 feet; of lower lake 6,500 feet; fall of outlet 1,200 feet. The outlet receives streams draining several small lakes, of which the largest are Upper and Lower Sardine Lakes. Downieville sheet.

Salt Creek (R); Colusa County; rises in the central part of T. 13 N., R. 3 W.; flows northeastward into Colusa Basin just south of Sand Creek; intermittent. Sheet E, Sacramento Valley map.

Salt Creek (R); Colusa County; rises in the northwestern part of T. 14 N., R. 4 W., at altitude 125 feet above sea level; flows northeastward into Colusa Basin about 5 miles south of west of Colusa; length 15 miles; intermittent. Sheet E, Sacramento Valley map.

Salt Creek (L); Glenn County; rises in the southern part of T. 21 N., R. 8 W.; flows eastward about 11 miles to junction with Stony Creek (tributary to Sacramento River) in the southern part of T. 21 N., R. 6 W.; flows in a narrow canyon. Punnett's map of Glenn and Colusa counties.

Salt Creek (R); Shasta County; rises in the northwestern part of T. 31 N., R. 5 W., at altitude 1,000 feet above sea level; flows northeastward into Sacramento River at Waugh; 2½ miles long; fall, 500 feet. Redding sheet.

Salt Creek (R); Shasta County; rises in the western part of T. 33 N., R. 2 W., at altitude 1,500 feet above sea level; flows southwestward about 6 miles into Little Cow Creek (tributary through Cow Creek to Sacramento River); fall, 950 feet; intermittent. Redding sheet.

Salt Creek (L); Shasta County; rises in the western part of T. 33 N., R. 4 W., at altitude 1,000 feet above sea level; flows southward 4 miles into Churn Creek (tributary to Sacramento River); fall, 350 feet; intermittent. Redding sheet.

Salt Creek (R); Shasta County; rises in the western part of T. 35 N., R. 2 W., on the northeast slope of Salt Creek Mountain, 2,000 feet above sea level; flows southeastward 4 miles by general course into Squaw Creek, a tributary of Pit River (tributary to the Sacramento); fall, 900 feet. Redding sheet.

Salt Creek (L); Shasta County; rises in the southeastern part of T. 36 N., R. 4 W., at elevation (approximate) 3,000 feet above sea level; flows southwestward about 10 miles and then northwestward 1½ miles to its junction with Sacramento River in the southeastern part of T. 35 N., R. 5 W.; fall, about 2,000 feet; principal tributary, Fall Creek; many short, unnamed tributaries. Redding sheet.

Salt Creek (L); Tehama County; rises in the northwestern part of T. 27 N., R. 8 W., at altitude 2,000 feet above sea level; flows northeastward about 18 miles into the South Fork of Cottonwood Creek (tributary through Cottonwood Creek to Sacramento River); fall, about 1,300 feet. Red Bluff sheet.

Salt Creek (L); Tehama County; rises in the eastern part of T. 28 N., R. 2. W., 1 mile northeast of Tuscan Springs, at altitude 1,050 feet above sea level; flows southwestward 6½ miles, southward 1½ miles, then southeastward 3 miles, and unites with Sacramento River just above Blackberry Island; fall, 810 feet, of which 700 feet occurs in the first 4 miles of course; intermittent; principal tributaries, Little Salt and New creeks, the last named a channel of Antelope Creek (q. v.). Tehama sheet.

Salt Creek, Little (R); rises in Tehama County, in the southern part of T. 28 N., R. 2 W., near Tuscan Springs, at altitude 1,000 feet above sea level; flows southwestward 5 miles into Salt Creek (tributary to Sacramento River); fall, 730 feet, of which 680 feet occurs in the first 3 miles of course; intermittent. Tehama sheet.

Salt Creek, Middle (L); rises in Shasta County, in the southeastern part of T. 36 N., R. 4 W., at altitude 3,000 feet above sea level; flows southwestward to junction with Sacramento River in northeast part of T. 35 N., R. 5 W.; length, about 6 miles; fall, 2,000 feet; principal tributary, North Fork; many small tributaries unnamed on map. Redding sheet.

Salt Creek, Middle, North Fork of (R); rises in Shasta County, in the western part of T. 36 N., R. 4 W., at altitude (approximate) 2,500 feet above sea level; flows southward 2½ miles into Middle Salt Creek, which is tributary to the Sacramento River; fall, 1,300 feet; receives four short, unnamed streams. Redding sheet.

Salt Creek, North (L); rises in Shasta County, in the eastern part of T. 36 N., R. 4 W., at altitude 3,000 feet above sea level; flows northwestward to its junction with Sacramento River in T. 36 N., R. 5 W., about 1 mile south of Portuguese Flat; length, about 6 miles; fall, approximate, 1,800 feet; principal tributary North Fork, which enters from the right. Shasta and Redding sheets.

Salt Creek, North, North Fork (R); rises in Shasta County, in the northeastern part of T. 36 N., R. 4 W., on the western slope of Nawtawakit Mountain, at altitude 5,000 feet above sea level; flows irregularly westward to its junction with North Salt Creek 2 miles southwest of Portuguese Flat; length, about 5 miles; fall, 3,200 feet. Shasta and Redding sheets.

Salt Gulch Creek (R); rises in Glenn County, in the northwestern part of T. 20 N., R. 4 W.; flows southeastward into French Creek (tributary to South Fork of Willows Creek, which discharges through Willows Creek into the Colusa Basin); intermittent. Sheet B, Sacramento Valley map.

Sand Creek (R); rises in Colusa County, in the southwestern part of T. 13 N., R. 3 W.; flows very irregularly northeastward into Colusa Basin west of Sycamore Slough; intermittent. Sheet E, Sacramento Valley map.

Sardine Creek (R); rises in Young America Lake in Sierra County, near the center of T. 20 N., R. 12 E., on the northwest slope of Sierra Buttes, at altitude 6,700 feet

above sea level; flows northeastward through Upper and Lower Sardine Lakes to the stream connecting Lower Salmon Lake with the North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); length, about 2 miles; fall, 1,000 feet. Downieville sheet.

Sardine Lakes, Upper and Lower; Sierra County, north-central part of T. 20 N., R. 12 E., at north base of Sierra Buttes; inlet Sardine Creek from Young America Lake; outlet Sardine Creek to North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); elevation of Upper Lake 6,050 feet, of Lower Lake 5,850 feet; fall of Sardine Creek below Lower Lake, about 200 feet. Downieville sheet.

Saxonia Lake; Sierra County, northwestern part of T. 20. N., R. 12 E.; outlet a stream less than a mile long, flowing northward to the outlet of Packer Lake, which discharges to North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus to Feather River and the Sacramento); elevation, 6,550 feet; fall of outlet, 300 feet. Downieville sheet.

Sayles Canyon Creek (L); rises in Eldorado County, in the southeastern part of T. 11 N., R. 17 E., at altitude 9,000 feet above sea level; flows northwestward into South Fork of American River (tributary through American River to the Sacramento); fall, 2,600 feet. Pyramid Peak sheet.

Scotchman Creek (L); rises in Nevada County, in the southwestern part of T. 17 N., R. 11 E., 5,000 feet above sea level; flows northwestward 3½ miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 2,300 feet. Colfax sheet.

Scott Creek (R); rises in Lake County, in the eastern part of T. 15 N., R. 11 W.; flows southeastward about 8 miles, northeastward 2 miles, then northwestward 3 miles and finally northeastward 2 miles into Tule Lake (outlet through Middle [Cache] Creek to Clear Lake and thus through Cache Creek to Yolo Basin). The distance from the source of this creek to the head of Tule Lake is about 4 miles; following the stream the distance is about 18 miles. Punnett's map of Lake County.

Seaman Gulch Creek (R); rises in Shasta County, in the northwestern part of T. 33 N., R. 2 W., at altitude 1,700 feet above sea level; flows southeastward about 2 miles into Little Cow Creek (tributary to Cow Creek, which flows into the Sacramento); fall, about 700 feet. Redding sheet.

Secret Canyon Creek (R); Placer County; rises in the northwestern part of T. 15 N., R. 13 E., at altitude 5,500 feet above sea level; flows southwestward 5½ miles into North Fork of Middle Fork of American River (tributary through Middle Fork of American to South Fork of American and thus through American River to the Sacramento); fall, 2,200 feet. Colfax sheet.

Secret Canyon Creek (L); Sierra County; rises in the northeastern part of T. 19 N., R. 10 E., at altitude 5,000 feet above sea level; flows east of north into North Fork of Yuba River (tributary through Middle Fork of Yuba to Yuba River and thus through Feather River to the Sacramento); length, 2 miles; fall, 2,000 feet. Downieville sheet.

Secret Ravine Creek (R); rises in Placer County, in the southeastern part of T. 12 N., R. 7 E., near Newcastle, at altitude 1,000 feet above sea level; flows southwestward 10 miles into Linda Creek (tributary to Bush Lake, American Basin); fall, about 800 feet; intermittent. Sacramento sheet.

Sereno Creek (R); rises in Placer County, in the southern part of T. 17 N., R. 14 E., in Sereno Lake, at altitude 6,902 feet above sea level; flows southward into North Fork of American River (tributary to Sacramento River); length, 3 miles; fall, 1,400 feet. Truckee sheet.

Sereno Lake; Placer County; southern part of T. 17 N., R. 14 E.; outlet, Sereno Creek to North Fork of American River (tributary through American River to the Sacramento); altitude, 6,902 feet; fall of outlet, 1,400 feet. Truckee sheet.

Sevenmile Creek (L); rises in Tehama County, in the western part of T. 28 N., R. 1 W., on the north slope of Tuscan Buttes, at altitude 1,400 feet above sea level; flows southwestward into the Sacramento about 4 miles west of Tuscan Springs; length, about 9 miles; fall, 1,100 feet. Tehama sheet.

Sevenmile Slough; Sacramento County, between Sacramento River and San Joaquin, north of Twitchell Island. Sacramento Valley map.

Shady Creek (R); rises in Nevada County, in the northwestern part of T. 17 N., R. 9 E., at altitude 2,800 feet above sea level; flows southwestward into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); length, 8 miles; fall, 1,800 feet. Smartsville sheet.

Shady Creek, Little (R); rises in Nevada County, in the southeastern part of T. 17 N., R. 7 E., at altitude 1,800 feet above sea level; flows southward 1½ miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 1,000 feet. Smartsville sheet.

Shady Run Creek (R); rises in Placer County, in the southwestern part of T. 16 N., R. 11 E., at altitude 4,000 feet above sea level; flows southeastward 1 mile into Blue Canyon Creek (tributary through North Fork of North Fork of American River to the North Fork of American River and thus through American River to the Sacramento); fall, 2,200 feet. Colfax sheet.

Shag Slough; Yolo Basin, Solano County; a branch of Cache Slough. Sheet P, Sacramento Valley map.

Shake Ravine Creek (R); rises in Butte County, in the northern part of T. 23 N., R. 4 E., at altitude 3,400 feet above sea level; flows southward 3 miles into West Branch of Feather River (tributary through North Fork of Feather River to Feather River and the Sacramento); fall, 1,200 feet. Chico sheet.

Sheep Corral Creek (L); rises in Glenn County, in the western part of T. 21 N., R. 5 W.; flows southeastward to the South Fork of Willows Creek (which discharges through Willows Creek to the Colusa Basin); intermittent. Sheet B, Sacramento Valley map.

Sheep Hollow Creek (R); rises in Butte County, in the southern part of T. 23 N., R. 1 E., at altitude about 1,100 feet above sea level; flows southwestward 6 miles into Sycamore Creek (tributary to Mud Creek and thus through Big Chico Creek to the Sacramento); fall, 900 feet, of which 800 feet occurs in the first 2 miles of course. Chico sheet.

Shepards Slough; Glenn County, Larkin Children's ranch; extending from the Central Irrigation Canal one-half mile north of Glenn southwestward about 5 miles. Sheets B and C, Sacramento Valley map.

Sheridan Creek (L); rises in Shasta County, in the southwestern part of T. 31 N., R. 1 W.; flows northwestward into Bear Creek (tributary to Sacramento River. Redding sheet.

Shingle Creek (L); rises in Shasta County, in the eastern part of T. 31 N., R. 1 W., near Shingletown; flows northwestward into Bear Creek (tributary to Sacramento River). Redding sheet.

Shirttail Canyon Creek (L); rises in Placer County, in the north central part of T. 15 N., R. 11 E., at altitude 4,200 feet above sea level; takes an irregular but in general southwesterly course to its junction with the North Fork of American River (tributary through American River to the Sacramento); length, about 15 miles; fall, 3,200 feet. Colfax sheet.

Shotgun Creek (R); rises in Shasta County in the west-central part of T. 37 N., R. 5 W.; flows eastward to its junction with Sacramento River 1 mile southwest of Sims station, in T. 37 N., R. 4 W.; length about 5 miles; fall, 2,000 feet. Shasta sheet.

Shotgun Lake; Nevada County, east-central part of T. 18 N., R. 12 E.; inlet, South Fork of Canyon Creek, which flows through it to its junction with Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to

the Sacramento); elevation, 6,600 feet; fall of the South Fork of Canyon Creek in the mile and a quarter below Shotgun Lake, 750 feet. Colfax sheet.

Siegler Creek (R); rises in Lake County, in the southern part of T. 12 N., R. 7 W., near Siegler Springs; flows southeastward 4 miles into St. Helena Creek (tributary through Putah Creek to Yolo Basin). Punnett's map of Lake County.

Silver Creek (R); Eldorado County; formed by junction of North and Middle forks in T. 12 N., R. 14 E., in Union Valley. The North Fork rises in the southwestern part of T. 13 N., R. 16 E., on Tells Peak, at altitude 8,500 feet above sea level; flows southwestward about 11 miles to its junction with the Middle Fork. The Middle Fork rises near the center of T. 12 N., R. 16 E., about 1½ miles west of the head of Rubicon River, at altitude 8,500 feet, and takes a very circuitous but in general westerly course to its junction with the North Fork. The length of the Middle Fork above the junction is about 16 miles. Below Union Valley Silver Creek flows southwestward about 5 miles, bends sharply to the northwest, southwest, and southeast in a deep horseshoe curve, then turns again and flows southwestward 5 miles to its junction with South Fork of American River (tributary through American River to the Sacramento) which it enters through a deep cnayon. Including the major windings, the length of Silver Creek from the South Fork of American River to the head of its Middle Fork is about 30 miles. The total fall in this distance is 6,300 feet. The fall of the North Fork above the junction is nearly 4,000 feet. The principal tributaries below the Forks are South Fork of Silver and Little Silver creeks. Pyramid Peak and Placerville sheets.

Silver Creek (R); Plumas County; rises in Silver Lake, in the northeastern part of T. 24 N., R. 7 E., at altitude about 5,950 feet above sea level; flows very irregularly eastward to its junction with Spanish Creek; length, about 5 miles; total fall about 2,000 feet; several small tributaries, one of which drains Gold Lake. Bidwell Bar sheet.

Silver Creek (R); Shasta County; rises in the northeastern part of T. 33 N., R. 1 E., in Silver Lake, at altitude 3,700 feet above sea level; flows southwestward into Clover Creek (tributary to Sacramento River); length, 3 miles; fall, about 700 feet. Denny's map of Shasta County.

Silver Creek, Little (R); rises in Eldorado County, in the southern part of T. 13 N., R. 14 E., on Robbs Peak (altitude 6,725 feet); flows southwestward 5 miles into Silver Creek (tributary through South Fork of American River to American River and the Sacramento); fall, about 1,200 feet; tributary, Hunters Creek. Pyramid Peak sheet.

Silver Creek, South Fork (L); rises in Eldorado County, in the southeastern part of T. 12 N., R. 16 E., on the south slope of Pyramid Peak (altitude 10,020 feet); takes a circuitous but in general southwesterly course to its junction with Silver Creek (tributary through South Fork of American River to American River and thus to the Sacramento); length, 20 miles; fall, 5,500 feet. Pyramid Peak sheet.

Silver Fork of South Fork of American River. See *American River, South Fork, Silver Fork of.*

Silver Lake; Amador County, on boundary between Ts. 9 and 10, R. 17 E.; several small inflowing streams; outlet, Silver Fork to South Fork of American River (tributary through American River to the Sacramento); elevation, 7,150 feet; about 2 miles long and 1 mile in maximum width. Pyramid Peak sheet.

Silver Lake; Plumas County, northeastern part of T. 24 N., R. 7 E.; two inlets, one of which drains a small lake; outlet, Silver Creek to Spanish Creek (tributary to Indian Creek and thence through North Fork of Feather River to Feather River and into the Sacramento); elevation above sea level, 5,950 feet. Bidwell Bar sheet.

Silver Lake; Shasta County, northeastern part of T. 33 N., R. 1 E.; outlet, Silver Creek to Clover Creek (tributary to Sacramento River); elevation, 3,700 feet; fall of outlet, about 700 feet. Lassen Peak sheet.

Simmerly Slough (L); Yuba County; joins Feather River at Marysville; about 4 miles long; receives Nigger Jack Slough. Marysville sheet.

Singer Creek (R); rises in Tehama County, in the southwestern part of T. 25 N., R. 2 E., at altitude 2,500 feet above sea level; flows southwestward about 14 miles into Pine Creek (tributary to the Sacramento) in the northern part of Butte County; the channels of the two creeks unite at several points; principal tributaries, Brush and Rattlesnake creeks; fall, 2,300 feet, of which 1,800 feet occurs in the first 6 miles. Chico sheet.

Slab Creek (R); rises in Eldorado County, in the southwestern part of T. 12 N., R. 13 E., on the north slope of Saddle Mountain, at altitude 5,000 feet above sea level; flows westward through Kings Meadows, then southwestward to its junction with South Fork of American River (tributary through American River to the Sacramento); length, 11 miles; fall, 3,300 feet, of which 1,300 feet occurs in the lower 5 miles; principal tributary, Gaddis Creek. Placerville sheet.

Slacks Ravine Creek (L); rises in Nevada County, in the northwestern part of T. 15 N., R. 6 E., at altitude 1,200 feet above sea level; flows westward 2 miles, then west of north 2 miles into Deer Creek (tributary through Yuba River to Feather River and thus to the Sacramento); fall, 700 feet. Smartsville sheet.

Slate Creek (L); Eldorado County; rises in the eastern part of T. 10 N., R. 10 E., near Diamond Springs, at altitude 1,700 feet above sea level; flows southwestward 2 miles, then in general northwestward 4 miles into Dry Creek (tributary through Webber Creek to South Fork of American River and thus through American River to the Sacramento); fall, 500 feet. Placerville sheet.

Slate Creek (L); Eldorado County; rises in the northwestern part of T. 11 N., R. 12 E., at altitude 3,300 feet above sea level; flows northwestward 2½ miles into Whaler Creek (tributary through Rock Creek to South Fork of American River and thus through American River to the Sacramento); fall, 1,000 feet. Placerville sheet.

Slate Creek (L); Plumas County; rises near the center of T. 22 N., R. 8 E., at altitude 5,300 feet above sea level; flows northwestward into Middle Fork of Feather River (tributary through Feather River to the Sacramento); 2 miles long; fall, 2,600 feet. Bidwell Bar sheet.

Slate Creek (R); Plumas County; rises in the southwestern part of T. 24 N., R. 9 E., at altitude 4,700 feet; flows west 1 mile and north 1½ miles into Spanish Creek (tributary through Indian Creek to North Fork of Feather River, to Feather River, and into the Sacramento); length, 2 miles; total fall, 900 feet. Bidwell Bar and Downieville sheets.

Slate Creek (R); Shasta County; rises in the northeastern part of T. 37 N., R. 6 W.; flows southward to the northeastern part of T. 36 N., R. 6 W., then southeastward to its junction with Sacramento River near La Moine station, in T. 36 N., R. 5 W.; length, about 10 miles; fall (approximate), 2,700 feet. Shasta and Redding sheets.

Slate Creek (R); Plumas County, formed in the southeastern part of T. 22 N., R. 9 E., by union of Little Slate and East Branch of Slate creeks. The East Branch, here considered the continuation of the main stream, rises on the north slope of Mount Fillmore, at altitude 6,500 feet above sea level; the general course of Slate Creek is southwesterly to its junction with North Fork of Yuba River (tributary through Yuba River to Feather River and thus to the Sacramento) in the eastern part of Yuba County in T. 19 N., R. 8 E.; length, including major windings, 24 miles; total fall between head of East Branch and North Fork of Yuba River, 4,500 feet. This creek drains portions of Plumas, Sierra, and Yuba counties. Downieville and Bidwell Bar sheets.

Slate Creek (R); Tehama County; rises in T. 28 N., R. 4 E., at altitude 5,000 feet above sea level; flows southeastward into Deer Creek (tributary to Sacramento River); length, 3 miles; fall, 900 feet. Lassen Peak sheet.

Slate Creek (L); Yuba County; rises in the eastern part of T. 19 N., R. 6 E., at altitude 2,500 feet above sea level; flows southwestward 2½ miles and unites with New York Creek to form Dry Creek (tributary to Yuba River and thus through Feather River to the Sacramento); fall, about 300 feet. Smartsville sheet.

Slate Creek, Little (L); Shasta County; rises in the eastern part of T. 35 N., R. 5 W.; at elevation 3,500 feet above sea level; flows southwest and then west into Sacramento River at La Moine station, opposite mouth of Slate Creek; length, about 3 miles; fall, 2,200 feet. Redding sheet.

Slate Creek, Little (R); Sierra County; rises in the central part of T. 22 N., R. 10 E., at altitude 6,500 feet above sea level; flows southwestward 5 miles into Slate Creek through which it is tributary to North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 1,500 feet. Downieville sheet.

Slug Canyon Creek (L); rises in Sierra County, in the northern part of T. 19 N., R. 10 E., at altitude 4,500 feet above sea level; flows northward 2 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba to Yuba River and thus through Feather River to the Sacramento); fall, 1,500 feet. Downieville sheet.

Slug Gulch Creek (R); rises in Placer County in the western part of T. 13 N., R. 10 E., at altitude 2,300 feet above sea level; flows southward 1½ miles into Middle Fork of American River (tributary through North Fork of American River and American River to the Sacramento); fall, 1,400 feet. Placerville sheet.

Sly Creek (L); rises in Plumas County, in the southern part of T. 21 N., R. 8 E., at altitude 4,500 feet above sea level; flows southwestward 5 miles, then west of north 1 mile into Lost Creek (tributary through South Fork of Feather River to Middle Fork of Feather and thus through Feather River to the Sacramento); fall, 1,200 feet. Bidwell Bar sheet.

Smith Creek (L); rises in Plumas County in Smith Lake in the southeastern part of T. 22 N., R. 12 E., at altitude 6,200 feet above sea level; flows northeastward 4 miles into Middle Fork of Feather River (tributary through Feather River to the Sacramento) near Mohawk; fall about 1,800 feet. Downieville sheet.

Smith's Creek (R); rises in Yolo County in T. 11 N., R. 1 W.; flows northeastward 4 miles; intermittent; water sinks before reaching Colusa Basin.

Smithneck Creek (L); rises in Sierra County, near the center of T. 20 N., R. 17 E., at altitude 6,300 feet above sea level; flows northwestward about 12 miles; discharges into the southeastern end of Sierra Valley on the Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall from head to Sierra Valley near Loyalton, 1,400 feet. Sierraville sheet.

Smith Lake; Plumas County, southwestern part of T. 22 N., R. 12 E., 1 small inlet; outlet, Smith Creek to Middle Fork of Feather River (tributary through Feather River to the Sacramento); elevation 6,300 feet; fall at outlet 1,800 feet in about 4 miles. Downieville sheet.

Smith Lake; Plumas County, southwestern part of T. 25 N., R. 9 E., 1 small inflowing stream; outlet, Wapanse Creek, to Spanish Creek (tributary through Indian Creek to North Fork of Feather River, to Feather River, and into the Sacramento); elevation, 4,100 feet. Bidwell Bar sheet.

Snaden Slough; Butte County, Bosquejo Rancho, east of Snaden Island; connected with the Sacramento 1½ miles above Wilson Landing. Vina sheet.

Snake River (L); rises near Gridley in Butte County, flows west of south into Sutter Basin, 10 miles, about 5 miles south of Marysville Buttes; intermittent. Sacramento Valley map.

Soda Creek (R); rises in Napa County, in the southeastern part of Rancho Catacoula (T. 8 N., R. 4 W); flows southeastward 3 miles then very irregularly northeast 5 miles to its junction with Putah Creek (tributary to Yolo Basin) 2½ miles south of Monticello; tributaries, Capell Creek and Steel Canyon Creek. On Punnett's map of

Napa County Capell Creek is indicated as the main stream. A short stretch of Soda Creek, to which Capell Creek appears to be tributary, is shown on the Napa sheet.

Soldier Creek (R); Eldorado County; rises in the eastern part of T. 11 N., R. 13 E., at altitude 4,500 feet above sea level; flows westward 3 miles and southwestward 2 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 2,200 feet; tributary, Little Soldier Creek. Placerville sheet.

Soldier Creek, Little (R); Eldorado County; rises in the central part of T. 11 N., R. 13 E., at altitude 4,400 feet above sea level; flows southwestward into Soldier Creek (tributary through South Fork of American River to American River and thus to the Sacramento); length, 1½ miles; fall, 400 feet. Placerville sheet.

Soto Lake; Butte County, Bosquejo Rancho, half a mile west of Soto station; an intermittent lake connected at flood stages by stream flowing west of south into a slough that joins the Sacramento at Missouri Bend; elevation, 170 feet. Vina sheet.

South Branch, South Fork. See name of main stream.

Spanish Creek (L); rises in Plumas County, in the southwestern part of T. 25 N., R. 8 E., on the south slope of Chapparal Hill at altitude 5,800 feet above sea level; takes a general southeasterly course about 5 miles then eastward 6 miles, northeastward 3 miles, then very irregularly northwest 7 miles to its junction with Indian Creek (tributary to North Fork of Feather River to Feather River and thus to the Sacramento); total fall, 2,800 feet; principal tributary, Spring Garden Creek. Its course is very circuitous. Bidwell Bar, Sierraville, and Indian Valley special sheets.

Spencer Lakes; Sierra County, northern part of T. 21 N., R. 11 E.; outlet, Middle Fork of North Fork of Yuba River, to North Fork of North Fork of Yuba (tributary through North Fork to Middle Fork of Yuba, and thus through Yuba River to Feather River and the Sacramento), Downieville branch; two lakes connected by a short westward-flowing stream; elevation, 6,800 feet. Downieville sheet.

Spider Lake; Eldorado County, in the southern part of T. 14 N., R. 15 E.; inlet a stream 1 mile long flowing north from a small lake just west of Buck Island Lake; elevation 6,700 feet above sea level; no outlet is shown on the map, but the lake lies in an area whose natural drainage is to Rubicon River (tributary through Middle Fork of American River to American River and thus to the Sarcamento). Truckee sheet.

Spring Branch [Elder Creek]. See *Willow Creek.*

Spring Creek (R); Colusa County; rises in the west-central part of T. 14 N., R. 4 W., in Spring Valley, at altitude 220 feet above sea level; flows northeastward about 6 miles into Colusa Basin, sinks before reaching Salt Creek with which its channel connects; intermittent. Sheet E, Sacramento Valley map.

Spring Creek (R); Nevada County; rises in the northwestern part of T. 17 N., R. 9 E., 1 mile west of Columbia Hill, at altitude 4,100 feet above sea level; flows southwestward 5 miles into South Fork of Yuba River (tributary through Yuba and Feather rivers to the Sacramento); fall, 2,200 feet. Colfax sheet.

Spring Creek (R); Shasta County; rises in the eastern part of T. 33 N., R. 6 W., about 3,800 feet above sea level; flows southeastward into Sacramento River at Keswick; length, 8 miles; fall, 3,200 feet. Redding sheet.

Spring Creek, South Fork (R); rises in Colusa County in the southwestern part of T. 14 N., R. 4 W.; flows northeastward about 6 miles into Spring Creek which flows into Colusa Basin. Sheet E, Sacramento Valley map.

Spring Garden Creek (R); rises in Plumas County, in northwest part of T. 23 N., R. 11 E. (altitude 4,500 feet above sea level); flows northwest 10 miles to Spanish Creek (tributary through Indian Creek to North Fork of Feather River, thence through Feather River to the Sacramento); fall, 1,000 feet. Downieville sheet.

Spring Valley Creek (R); rises in Butte County, 1 mile southeast of Cherokee, in T. 21 N., R. 4 E., at altitude 1,200 feet above sea level; flows northward 3 miles into West Branch of Feather River (tributary to North Fork of Feather River, and thence through Feather River to the Sacramento); fall, 600 feet. Chico sheet.

56378°—WSP 295—12——6*

Spring Valley Reservoir; Butte County, north-central part of T. 22 N., R. 4 E.; inlet, Concow Creek; outlet, Concow Creek to West Branch of Feather River (tributary through North Fork of Feather River to Feather River and the Sacramento); elevation above sea level, about 2,000 feet; fall of outlet, 800 feet. Chico sheet.

Squaw Queen Creek (R); Plumas County; rises near the center of T. 25 N., R. 14 E.; at altitude about 7,000 feet above sea level; flows northwest, then west to junction with Red Clover Creek (tributary through Indian Creek, North Fork of Feather River, to Feather River and thence to the Sacramento); principal tributary, Last Chance Creek; fall, about 3,200 feet. Honey Lake and Indian Valley special sheets.

Squaw Creek (R); Shasta County; rises in the southeast part of T. 30 N., R. 7 W., at altitude 1,200 feet above sea level; flows southeastward about 4 miles into Crow Creek (tributary through Roaring River to North Fork of Cottonwood Creek, and thus through Cottonwood Creek to the Sacramento); fall, 500 feet. Red Bluff sheet.

Squaw Creek (R); Shasta County; rises in the eastern part of T. 34 N., R. 6 W., at altitude 3,200 feet above sea level; flows southward 3 miles, then almost due east about 4 miles to its junction with Sacramento River 1 mile below Kennett; fall, approximately 2,500 feet. Red Bluff and Redding sheets.

Squaw Creek (R); Shasta County; rises in the northeastern part of T. 37 N., R. 2 W., 2,500 feet above sea level; flows, in general, south of west to Pit River (tributary to Sacramento River) near Copper City; length, about 30 miles; fall, 1,800 feet; tributaries, East Fork, North Fork, and Didallas Creek. Shasta and Redding sheets.

Squaw Creek (R); Siskiyou County; rises on the south slope of Mount Shasta, at altitude 8,000 feet above sea level; flows southward into McCloud River (tributary through Pit River to the Sacramento); length, about 25 miles; fall, 6,500 feet, of which 4,000 feet occurs in the first 6 miles of course. Shasta sheet.

Squaw Creek, East Fork (L); rises in Shasta County, in the northwest part of T. 35 N., R. 1 W., 3,000 feet above sea level; flows northwest 3 miles to Squaw Creek (tributary to Pit River and thus to the Sacramento); fall, 1,400 feet. Redding sheet.

Squaw Creek, North Fork (R); rises in Shasta County, in the western part of T. 36 N., R. 2 W., at altitude 3,500 feet above sea level; flows irregularly southward 8 miles to its junction with Squaw Creek (tributary to Pit River and thus to the Sacramento); fall, 2,200 feet. Redding sheet.

Squaw Creek, South Fork (R); rises in Shasta County, in the western part of T. 33 N., R. 6 W., about 3,000 feet above sea level; flows northeastward 2 miles into Squaw Creek (tributary to Sacramento River); fall, 1,500 feet. Redding sheet.

Squaw Lake; Sierra County, northwestern part of T. 21 N., R. 12 E.; outlet a stream less than one-eighth mile long, flowing northwestward into Gold Lake (outlet Frazier Creek to Middle Fork of Feather River and thence through Feather River to the Sacramento); elevation above sea, 6,600 feet; above Gold Lake, 200 feet.

Squirrel Creek (L); Nevada County; rises in the southwestern part of T. 16 N., R. 8 E., a mile west of Grass Valley, at altitude 2,500 feet above sea level; takes a general westerly course to its junction with Deer Creek (tributary through Yuba River to Feather River and thus to the Sacramento); length, 10 miles; fall, 1,500 feet. The lower course of this creek lies through Penn Valley. Smartsville sheet.

Squirrel Creek (L); Plumas County; rises in the northern part of T. 22 N., R. 11 E., at altitude 5,500 feet above sea level; flows somewhat north of east into Jamison Creek (tributary to Middle Fork of Feather River and thence through Feather River into the Sacramento), which it enters in the extreme southwestern part of T. 23 N., R. 12 E.; length, about 4 miles; fall, 1,000 feet. Downieville sheet.

Squirrel Creek (R); Plumas County; rises in the southwestern part of T. 25 N., R. 11 E., on northwest slope of Grizzly Mountains (7,700 feet above sea level); flows southward 7 miles to its junction with Pine Creek, a tributary of Spring Garden Creek (tributary to Spanish Creek, which flows through Indian Creek to North Fork of Feather River, to Feather River, and into the Sacramento). Downieville sheet.

St. Catherine Creek (L); rises in Sierra County, in the eastern part of T. 19 N., R. 9 E., at altitude 4,100 feet above sea level; flows northwestward 1½ miles into North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); fall, 1,500 feet. Downieville sheet.

St. Helena Creek (R); rises in Lake County, in the east central part of T. 10 N., R. 7 W.; flows northward 7 miles, then southeastward 1½ miles into Putah Creek (tributary to Yolo Basin); tributary Siegler Creek. Punnett's map of Lake County.

Stanton Creek (L); rises in Lake County, in the southwestern part of T. 16 N., R. 6 W.; flows southward into North Fork of Cache Creek (tributary through Cache Creek to Yolo Basin); length, 5 miles. Land Office map of California, 1907. On Punnett's map of Lake County the name Stanton Creek is applied to the stretch of the North Fork of Cache Creek extending southward from Stanton Creek.

Star City Creek (L); rises in Shasta County, in the northern part of T. 38 N., R. 1 W., on the north slope of Grizzly Peak, at altitude 4,000 feet above sea level; flows somewhat south of west about 5 miles to junction with McCloud River (tributary to Pit River and thus to the Sacramento); fall, 1,700 feet. Shasta sheet.

Steamboat Slough; Yolo Basin, west side of Grand Island at the head of the Sacramento delta; nearly 12 miles long. The west channel of the Sacramento River extends southward nearly 12 miles along the west side of Grand Island to union with the main stream.

When the Sacramento was first navigated fewer obstructions to navigation were encountered in Steamboat Slough than in old Sacramento River, as the other branch is called. For many years the slough was therefore the channel preferred by navigators, but the condition of old Sacramento River has greatly improved and it is now the main stream. Steamboat Slough receives the Yolo Basin discharge through Cache Slough. Sacramento Valley map. Report of Commission on Rivers and Harbors to the Governor of California, 1890, p. 36.

Steel Canyon Creek (R); rises in Napa County in the northern part of T. 7 N., R. 3 W.; flows northwestward 3 miles into Soda Creek (tributary through Putah Creek to Yolo Basin). Napa sheet; Punnett's map of Napa County.

Steep Hollow Creek (R); rises in Nevada County, in the southern part of T. 17 N., R. 11 E., at altitude 5,500 feet above sea level; flows southwestward into Bear River (tributary through Feather River to the Sacramento); length about 15 miles; fall, 3,000 feet. Colfax sheet.

Sterling Lake; Nevada County, northeastern part of T. 17 N., R. 13 E.; outlet a stream 2 miles long flowing in a circuitous but in general westerly direction to Fordyce Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); elevation, 6,700 feet; fall of outlet, 800 feet. Truckee sheet.

Stillwater Creek (L); rises in Shasta County, near the center of T. 32 N., R. 4 W., where it is formed by the junction of its East and West forks (q. v.); flows southward across Stillwater Plains into Sacramento River; length below junction of forks about 12 miles, in which distance it falls approximately 250 feet; intermittent. Redding sheet.

Stillwater Creek, East Fork (L); rises in Shasta County, near the center of T. 33 N., R. 4 W., at altitude 1,200 feet above sea level; flows southward 7 miles, and unites with West Fork to form Stillwater Creek (tributary to Sacramento River); fall, 600 feet, of which 400 feet occurs in the first 2 miles of course; principal tributary, East Valley Creek; intermittent. Redding sheet.

Stillwater Creek, West Fork (R); rises in Shasta County, in the northern part of T. 33 N., R. 4 W., on the eastern slope of Gray Rocks Mountain, at altitude 1,800 feet above sea level; flows southward about 10 miles, and unites with the East Fork to form Stillwater Creek (tributary to Sacramento River); fall, about 700 feet, of which 500 feet occurs in first mile of course; principal tributary, Moody Creek; intermittent. Redding sheet.

Stinking Canyon Creek (R); rises in Shasta County, in the southeastern part of T. 33 N., R. 4 W., at altitude 700 feet above sea level; flows southeastward 2 miles into Dry Creek (tributary to Little Cow Creek, and thus through Cow Creek to Sacramento River); fall, 200 feet; intermittent. Redding sheet.

Stone Corral Creek (R); rises in Colusa County, in the western part of T. 17 N., R. 5 W.; flows very irregularly eastward into Colusa Basin, east of Maxwell; intermittent. Sheet D, Sacramento Valley map.

Stony Creek (L); Butte County; rises in the west-central part of T. 22 N., R. 5 E., at altitude 3,500 feet above sea level; flows southward 4 miles into North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,600 feet. Bidwell Bar sheet.

Stony Creek (R); rises in the western part of Glenn County, near the center of T. 18 N., R. 6 W., where it is formed by the union of South Fork and Little Stony Creek; drains an area comprising about 828 square miles, of which about 600 square miles is embraced in an irregular parallelogram 10 to 15 miles wide, touching the crest of the Coast Range for a distance of 50 to 60 miles. The creek flows northward along the eastern border of this area about 35 miles, then northeastward about 15 miles, and finally southeastward to its junction with the Sacramento near St. John. It is about 90 miles long and its fall is 4,000 to 5,000 feet. The basin lies south of the basin of Thomas Creek, which divides it from that of Cottonwood Creek on the north, and north of the Cache Creek basin. The tributaries from the west come from the granitic rocks of the Coast Range; the main stream flows through sedimentary rocks. At various points the streams intersect conglomerate ridges which, because of their resistance to erosion, have produced favorable sites for dams and reservoirs. Elevations in the basin range from a few hundred feet in the valleys to 6,000 feet or more at the summit of the range. Mean annual precipitation ranges from 18 inches in the valley to 40 inches or more on the mountains, where more or less of it occurs as snow. The rainfall not absorbed by the soil runs off rapidly. The low-water flow is 50 to 100 second feet, and this sinks in the gravel bed of the stream within a few miles of the point where it breaks through the buttes into Sacramento Valley. The creek rises rapidly after a few days of heavy rainfall, and for short periods may discharge 10,000 second feet of water to the Sacramento. The spring flow disappears gradually, and the creek sends little water to the Sacramento after the first of June.[1]

The principal tributaries of Stony Creek are Little Stony from the south end of the mountain area, Briscoe Creek from its middle, Grindstone Creek from its north end, and North Fork, which enters the main creek about 10 miles northwest of Orland.

The creek has been used as a source of irrigation water in the northeastern part of Glenn County. The Orland project, under construction by the Reclamation Service, will take water from Stony Creek by the aid of several dams for storage and diversion.

Gaging station near Fruto, 1901–1909.

Punnett's maps of Glenn and Colusa counties; Red Bluff and Vina sheets; Water-Supply Paper U. S. Geol. Survey No. 86.

Stony Creek, Little (R); Colusa County; rises in the northeastern part of T. 16 N., R. 8 W.; flows southeastward about 6 miles, northeastward 4 miles, eastward 2½ miles, then northward 8 miles, uniting with the South Fork to form Stony Creek (tributary to the Sacramento) in the central part of T. 18 N., R. 6 W.; principal tributaries, Cedar and Indian creeks; gaging station near Lodoga, 1907–1909. Punnett's map of Glenn and Colusa counties.

Stony Creek, North Fork (L); rises in Glenn County, in the northwestern part of T. 22 N., R. 7 W.; flows irregularly eastward, and unites with Stony Creek (tributary to Sacramento River) in Tehama County, in the southwestern part of T. 23 N., R. 4 W.; length, about 20 miles. Punnett's map of Glenn and Colusa counties.

[1] Report of examining commission [C. T. Reed, C. T. Grunsky, and J. J. Crawford] on rivers and harbors to the Governor of California, Sacramento, 1890, p. 21.

Stony Creek, South Fork (R); rises in Colusa County, in the southeastern part of T. 17 N., R. 8 W.; takes a general northeasterly course to the center of T. 18 N., R. 6 W., where it unites with Little Stony Creek to form Stony Creek (tributary to Sacramento River). Punnett's map of Glenn and Colusa counties.

Strawberry Creek (L); rises in Eldorado County, in the eastern part of T. 10 N., R. 17 E., at altitude 9,000 feet above sea level; flows northwestward 6 miles into South Fork of American River (tributary through American River to the Sacramento) at the lower end of Strawberry Valley; fall, 3,300 feet. Pyramid Peak sheet.

Strong Ranch Slough; Sacramento County, Rancho del Paso, north of American River. Brighton sheet.

Sucker Run (R); rises in Butte County, in the northern part of T. 20 N., R. 7 E., 1 mile north of Lumpkin, at altitude 4,100 feet above sea level; flows irregularly southwestward into South Fork of Feather River (tributary to Middle Fork of Feather River, and thus through Feather River to the Sacramento); fall, 2,700 feet; length, 8 miles. Bidwell Bar sheet.

Sugarloaf Creek (R); rises in Shasta County, in western part of T. 35 N., R. 5 W., at altitude 2,000 feet above sea level; flows southeastward 4 miles into the Sacramento in the southern part of the same township; fall, about 1,000 feet; receives a number of small tributaries. Redding sheet.

Sugarloaf Creek, Little (R); rises in Shasta County, in the southern part of T. 35 N., R. 5 W., at altitude 2,000 feet above sea level; flows southeastward 2 miles and joins Sacramento River in the northern part of T. 34 N., R. 5 W.; fall, 1,100 feet. Redding sheet.

Sugarpine Gulch Creek (L); rises in Shasta County, in the southern part of T. 34 N., R. 2 W., at altitude 2,000 feet above sea level; flows south of west 2 miles into Pit River (tributary to Sacramento River); fall, about 1,200 feet. Redding sheet.

Sulphur Creek (R); rises in Colusa County in the eastern part of T. 14 N., R. 6 W.; flows southeastward 3 miles, then eastward 2 miles into Bear Creek (tributary through Cache Creek to Yolo Basin). This creek drains an area in which there are quicksilver mines and its own bed contains many mineral springs. Its water is so highly mineralized that it renders the water of the larger creek brackish and unfit for irrigation. Water-Supply Paper U. S. Geol. Survey No. 45, 1901, p. 27.

Surprise Creek (R); rises in Plumas County in the southeastern part of T. 28 N., R. 10 E., at altitude 5,500 feet above sea level; flows east of south 6 miles into Lights Creek (tributary to Indian Creek, which flows through North Fork of Feather River to Feather River and thus to the Sacramento); total fall 1,600 feet. Called Moonlight Creek on Punnett's map of Plumas County. Honey Lake sheet and Indian Valley special map.

Susanville Canyon Creek (R); rises in Shasta County, in the western part of T. 34 N., R. 2 W., on the south slope of Brock Mountain, 2,000 feet above sea level; flows southeastward 2 miles into Pit River (tributary to Sacramento River); fall, 1,100 feet. Redding sheet.

Sutter Basin; east side of Sacramento River above mouth of Feather River, between the relatively high banks of these streams and south of Marysville Buttes. If the entire district occasionally submerged along this part of Sacramento River is considered a part of the flood basin, its length is over 30 miles and its average width 6 miles. The upper 10 miles of this area is, however, so much higher than the rest of the basin that as soon as water ceases to flow in from above it is quickly drained into the lower portion of the flat basin whence there is no escape for the water except at the height of the water in Sacramento River at its confluence with Feather River. The elevation of high water at the mouth of Feather River in ordinary floods is about 34 feet. When Sutter Basin is full of water to this height its surface has an area of 138 square miles and its contents range from 25,000,000,000 cubic feet of water to 39,000,000,000 cubic feet.

Sutter Basin is filled at very high stages of Sacramento River. It receives water from below as well as from above, and not infrequently its greatest supply enters from its lower end. Long before the river is at a height which would endanger levees below the mouth of Feather River its waters have been flowing through Sacramento Slough and through outlet channels of Sutter Basin northward into the basin and even across banks into it.

The general elevation of the lowest portion of this basin is 19 to 20 feet. The outlets are a number of deep sloughs which discharge into Sacramento and Feather rivers close above their confluence.

Sutter Basin receives all the water flowing southward past Sutter Buttes from Butte Basin, the floods of Butte Slough, Feather River floods, all water from breaks in the east bank Sacramento levees from Buttes Slough to Knights Landing, and indirectly the water from all east side levee breaks above Butte Slough and all the water from breaks in the west side levees of Feather River.

Sacramento Valley map; report of Examining Commission on Rivers and Harbors to the Governor of California (C. T. Reed, C. E. Grunsky, J. J. Crawford, commissioners), Sacramento, 1890, pp. 63–64.

Sutters Slough; Yolo Basin; natural relief channel in the right bank of the Sacramento; continuous to Steamboat Slough. The head of this slough is open and a small amount of water flows through it. Sheet P, Sacramento Valley map.

Swamp Creek (R); rises in Plumas County near the center of T. 24 N., R. 5 E., at altitude 4,600 feet above sea level; flows south 2 miles, then southeast 1½ miles into the North Fork of Feather River (tributary to Feather River and thus to the Sacramento); total fall, 3,000 feet. Bidwell Bar sheet.

Swede Creek (L); rises in Shasta County, in the northern part of T. 32 N., R. 2 W., at altitude 1,000 feet above sea level; flows southwestward 9 miles across Swede Creek plains to junction with Little Cow Creek (tributary through Cow Creek to Sacramento River); fall, about 600 feet; intermittent. Redding sheet.

Swedrengen Creek (L); rises in the eastern part of Modoc County, on the western slope of Warner Mountains, at altitude 6,000 feet above sea level; flows southwestward about 8 miles into the North Fork of Pit River (tributary through Pit River to the Sacramento); fall, about 1,300 feet. Alturas sheet.

Sweeney Creek (L); rises in Solano County, in T. 6 N., R. 1 W., 4 miles northwest of Vacaville; flows northeastward for 6 miles, then southeastward into Cache Slough; intermittent. Vacaville sheet.

Sweetwater Creek (L); rises in Eldorado County, in the central part of T. 10 N., R. 9 E., on the west slope of Pine Hill, at altitude 1,400 feet above sea level; flows northwestward into South Fork of American River (tributary through American River to the Sacramento) at Salmon Falls; length, 4 miles; fall, 800 feet. Sacramento sheet.

Sycamore Creek (L); rises in Butte County, in the southern part of T. 23 N., R. 2 E., at altitude 1,700 feet above sea level; flows southwestward about 5 miles, then westward 6 miles into Mud Creek (tributary to the Sacramento through Big Chico Creek); fall, 1,500 feet, of which 1,200 feet occurs in the first 4 miles of course. Chico sheet.

Sycamore Slough; Colusa Basin, west side of Sacramento River; the outfall channel of Colusa Basin entering the Sacramento River at Knights Landing. The upper Sycamore Slough which extends southwestward from the river at Sycamore has built up a low, flat ridge nearly across the west side trough and formed a lesser upper basin (Mormon Basin) which except in times of general inundation is connected with the lower or main basin only by a narrow throat between Sycamore Slough and the higher west side plain. Lower Sycamore Slough can discharge water into the Sacramento only when at the level of the water of the river at Knights Landing. Sheets E and F, Sacramento Valley map.

Sykes Slough; Yolo Basin; extends southward from Putah Creek south of Davisville toward the South Fork of Putah Creek. Sacramento Valley map.

Tadpole Canyon Creek (L); rises in Placer County, in the northern part of T. 15 N., R. 13 E., at altitude 6,300 feet above sea level; flows northwestward 2½ miles into North Fork of American River (tributary through American River to the Sacramento); fall, 3,100 feet. Colfax sheet.

Tadpole Creek (L); rises in Shasta County, in the southwestern part of T. 31 N., R. 5 W., at altitude 1,500 feet; flows southeastward; water sinks before reaching Clear Creek (tributary to Sacramento River) to which the creek basin is topographically tributary; intermittent. Redding sheet.

Tartarus Lake; extreme northwestern part of Plumas County about 7 miles southeast of Lassen Peak; neither inlet nor outlet shown on map; elevation about 6,000 feet. This lake lies in Hot Spring Valley. Lassen Peak sheet.

Taylor Creek (R); rises in Plumas County, in the eastern part of T. 25 N., R. 10 E., on the western slope of the Devils Punch Bowl (altitude 5,500 feet above sea level); flows west of south 5 miles to its junction with Spring Garden Creek (tributary to Spanish Creek and thence through Indian Creek to North Fork of Feather River, to Feather River, and into the Sacramento); fall, 1,900 feet. Downieville sheet.

Taylor Lake; Plumas County, southeastern part of T. 27 N., R. 11 E., one inlet; outlet through Hungry Creek to Indian Creek (tributary through North Fork of Feather River to Feather River and thence to the Sacramento); elevation 6,850 feet above sea level. Taylor ditch takes water from this lake for Taylor diggings (altitude 5,000 feet above sea level). Indian Valley special map.

Tells Creek (R); rises in Eldorado County, in the eastern part of T. 13 N., R. 15 E., northeast of Filipinis, at altitude 7,500 feet above sea level; flows southwestward 8 miles into the North Fork of Silver Creek (tributary through Silver Creek to South Fork of American River and thus through American River to the Sacramento); fall, 2,700 feet. Pyramid Peak sheet.

Texas Creek (L); rises in Nevada County, in the central part of T. 18 N., R. 12 E., in a small lake on the south slope of Bowman Mountain at altitude 6,800 feet above sea level; flows southwestward 4 miles into Canyon Creek (tributary to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento) fall, 2,300 feet; principal tributary, stream from Lindsey Lakes. Colfax sheet.

Thomas Creek (R); rises in Tehama County, in the northern part of T. 25 N., Rs. 9 and 10 W., on the southern slope of Mount Linn and the eastern slope of Yolla Bolly Mountains, 6,000 feet above sea level; flows southeastward about 22 miles, then northeastward about 35 miles to junction with Sacramento River in Saucos Rancho, 5 miles south of Tehama; total fall, 5,800 feet: flows over sand bed and is intermittent in lower course; many small branching tributaries. Vina sheet; Punnett's map of Tehama County.

Thompson Creek (L); rises in Plumas County in the northwestern part of T. 23 N., R. 10 E., (altitude 6,500 feet); flows northeastward 4 miles, northwestward 2 miles, and then northeastward 1 mile into Spring Garden Creek (tributary to Spanish Creek, through Indian Creek to North Fork of Feather River, to Feather River, and into the Sacramento); fall, about 2,900 feet, of which 2,000 feet occurs in the first 2½ miles. The course of this creek is very circuitous, the stream traveling more than 8 miles in covering the five miles between its source and mouth. Downieville sheets.

Threemile Creek. See *Freeman Creek, Plumas County.*

Thurston Creek; rises in Lake County in T. 13 N., R. 8 W., southeast of Mount Konachti; flows southeastward 5 miles into a small lake (Thurston Lake?) 1 mile west of the lower end of Clear Lake. No outlet of this lake is shown on the map but the course of the drainage immediately south indicates that it lies in the Clear Lake drainage area. Punnett's map of Lake County.

Timber Canyon Creek (L); rises in Shasta County, in the central part of T. 35 N., R. 2 W., on the north slope of Brock Butte, at altitude 3,000 feet above sea level; flows northwestward 2 miles into Squaw Creek (tributary to Pit River and thus to the Sacramento); fall, 1,500 feet. Redding sheet.

Todd Creek (R); rises in Placer County, in the northern part of T. 13 N., R. 10 E., near Todd Valley, at altitude 2,600 feet above sea level; flows southwestward 5 miles into Middle Fork of American River (tributary through North Fork of American River to American River and thus to the Sacramento); fall, 1,700 feet. Placerville sheet.

Toddhunters Lake; Yolo Basin, 3 miles west of Sacramento River about 7 miles northwest of Sacramento. Sheet L, Sacramento Valley map.

Toll Gate Creek (R); rises in Plumas County, in the northwestern part of T. 25 N., R. 10 E., on the southern slope of Mount Hough (altitude 7,254 feet above sea level); flows southwestward about 5 miles into Spanish Creek (tributary to Indian Creek thence through North Fork of Feather River to Feather River and into the Sacramento); fall, about 2,000 feet. Downieville sheet.

Tom Creek (L); rises in eastern Modoc County, on the western slope of Warner Mountains, at altitude 5,000 feet above sea level; flows north of west 4 miles into North Fork of Pit River, which is tributary through Pit River to the Sacramento; fall, 300 feet. Alturas sheet.

Tom Dow Creek (R); rises in Shasta County, in the northern part of T. 37 N., R. 3 W., at altitude 3,000 feet above sea level; flows southeastward about 3 miles into Squaw Creek (tributary to McCloud River and thus through Pit River to the Sacramento); fall, 1,400 feet. Shasta sheet.

Toomes Creek (L); rises in Tehama County, in the northwestern part of T. 25 N., R. 1 W., 400 feet above sea level; flows southwestward about 7 miles, and unites with Sacramento River opposite Blethen Island; fall, 220 feet; intermittent. Tehama and Vina sheets.

Town Creek (R); rises in Shasta County, in the northern part of T. 34 N., R. 3 W., on the south slope of Town Mountain, 3,000 feet above sea level; flows southeastward 3 miles into Squaw Creek (tributary to Pit River and thus to the Sacramento); fall, 2,200 feet; intermittent. Redding sheet.

Townsend Gulch Creek (L); rises in Shasta County, in the western part of T. 31 N., R. 1 W., at altitude 1,600 feet above sea level; flows northwestward 2 miles into the South Fork of Cow Creek (tributary through Cow Creek to Sacramento River) at Ellis; fall, 300 feet; intermittent. Redding sheet.

Trap Creek; rises in Nevada County, in the southwestern part of T. 17 N., R. 12 E., at altitude 5,000 feet above sea level; flows westward 1 mile into Fall Creek (tributary through South Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); fall, 1,800 feet. Truckee sheet.

Traverse Creek (L); rises in Eldorado County, in the northeastern part of T. 12 N., R. 10 E., near Georgetown, at altitude 2,700 feet above sea level; flows east of south 6 miles into West Fork of Rock Creek (tributary through Rock Creek to South Fork of American River and thus through American River to the Sacramento); fall, 800 feet. Placerville sheet.

Trout Creek (R); rises in Siskiyou County, in T. 42 N., R. 1 E.; flows southwestward; at high stages carries water to Ash Creek (tributary to McCloud River, which flows into the Pit and is thus tributary to the Sacramento); normal flow sinks into the lava beds at the east base of Mount Shasta and reappears southward as springs which discharge to the McCloud. Modoc Lava Bed sheet.

Truckee Creek (R); rises in Tehama County, in T. 25 N., R. 3 W., at altitude 330 feet above sea level; winds very irregularly eastward about 5 miles into Saucos Rancho; sinks about 1 mile west of Tehama; fall, 100 feet; intermittent. Tehama sheet.

Tule Lake; Lake County, northern part of T. 15 N., R. 10 W.; inlet Scott Creek; outlet stream one-half mile long flowing eastward to Middle [Cache] Creek which

flows into northern end of Clear Lake (outlet through Cache Creek to Yolo Basin). Punnett's map of Lake County 1908.

Tule Slough; Colusa Basin, west side Sacramento River extending southward from a point about a mile south of Grand Island. Sheet E, Sacramento Valley map.

Twin Lakes; Alpine County, T. 10 N., on boundary between Rs. 17 and 18 E. several small inflowing streams; outlet a stream 10 miles long flowing irregularly westward into Silver Fork (tributary through South Fork of American River and American River to the Sacramento) in Eldorado County in T. 10 N., R. 16 E., altitude 7,900 feet; fall of outlet 2,000 feet. Pyramid Peak sheet.

Twin Valley Creek (R); rises in Lake County, in the southwestern part of T. 16 N., R. 8 W.; flows northeastward 1½ miles, then eastward 2 miles into North Fork of Cache Creek (tributary through Cache Creek to Yolo Basin). This creek enters the North Fork of Cache Creek in the stretch called Bartlett Creek on Punnett's map of Lake County.

Ualtis Creek (L); rises in Solano County, in the southern part of T. 7 N., R. 2 W., on the north slope of Mount Vaca at altitude 2,000 feet above sea level. Flows eastward 3 miles through Weldon Canyon, in general southeastward, to its junction with Alamo Creek (tributary to Cache Slough) near Binghampton. Napa sheet; Punnett's map of Solano County.

Upper Salmon Lake. See *Salmon Lakes, Upper and Lower.*

Upper Sardine Lake. See *Sardine Lakes, Upper and Lower.*

Valley Creek, East (L); rises in Shasta County, in the eastern part of T. 33 N., R. 4 W., on the south slope of Bear Mountain, at altitude 1,300 feet above sea level; flows southward 2 miles, then southwestward 3 miles into East Fork of Stillwater Creek (tributary through Stillwater Creek to the Sacramento); fall, about 600 feet, of which 500 feet occurs in the first 2 miles of course; intermittent. Redding sheet.

Valley Creek, North (R); rises in Plumas County, near the center of T. 24 N., R. 5 E., at altitude 4,500 feet above sea level; flows northeastward about 5 miles into Rock Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); fall, 700 feet. Bidwell Bar sheet.

Valley Creek, West (L); rises in Lassen County, in the southwestern part of T. 37 N., R. 16 E., on the western slope of Warner Mountains, at altitude (approximate) 7,000 feet above sea level; flows in a general westerly and northwesterly course about 18 miles to its junction with the South Fork of Pit River, through which it is tributary to the Pit and thus to the Sacramento; fall, about 2,400 feet; gaging station near Likely, 1904–5. Alturas sheet; called Clark's Creek on Starkweather's map of Lassen County (1910).

Volcano Canyon Creek (R); rises in Placer County, in the central part of T. 15 N., R. 11 E., at altitude 4,500 feet above sea level; flows southwestward about 10 miles into Middle Fork of American River (tributary through North Fork of American to American River and thus to the Sacramento); fall, 3,300 feet. Colfax sheet.

Volcano Lake; Sierra County, central part of T. 20 N., R. 12 E., a half mile south of Lower Sardine Lake; outlet a stream less than a mile long flowing northeastward to the stream connecting Lower Salmon Lake with the North Fork of the North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); elevation, 6,200 feet; fall of outlet, about 700 feet. Downieville sheet.

Wades Lake; Plumas County, northeastern part of T. 21 N., R. 11 E.; no inlet; outlet, stream about three-fourths mile long flowing northeastward into Little Jamison Creek (tributary through Jamison Creek to Middle Fork of Feather River and thence through Feather River to the Sacramento) between Jamison and Grass lakes; elevation above sea, 6,450 feet; fall of outlet, about 500 feet. Downieville sheet.

Wagon Valley Creek (L); rises in Siskiyou County, in the northeastern part of T. 40 N., R. 5 W., about 5 miles northwest of Sisson, at altitude 4,000 feet above sea level; flows southeastward 8 miles to its junction with Sacramento River in the southwestern part of T. 40 N., R. 4 W., 2 miles south of Sisson; fall, 600 feet. Shasta sheet.

Wapanse Creek (L); rises in Plumas County in the southwestern part of T. 25 N., R. 9 E., in Smith Lake, at altitude 4,100 feet above sea level; flows southward 3 miles into Spanish Creek (tributary to Indian Creek and thence through North Fork of Feather River to Feather River and into the Sacramento); fall, about 250 feet. Bidwell Bar sheet.

Ward's Creek (L); rises in Plumas County, in the southern part of T. 25 N., R. 12 E., on south slope of Mt. Ingalls (altitude 8,377 feet); flows northwestward about 10 miles to junction with Indian Creek (tributary through North Fork of Feather River to Feather River and thus to the Sacramento); in Genesee Valley, 1 mile east of Genesee; fall, about 4,700 feet. Indian Valley special sheet.

Warner Creek (L); rises on south slope of Lassen Peak in southern part of Shasta County, at altitude about 9,000 feet above sea level; takes a general southerly course to its junction with the North Fork of Feather River (tributary through Feather River to the Sacramento) in the northwestern part of Plumas County; length, about 16 miles; fall, about 4,500 feet. Lassen Peak sheet.

Washington Lake; Yolo Basin, 2½ miles west of Sacramento; a long, narrow slough-like water body mapped as permanent on the Sacramento Valley map, sheet L.

Water Canyon Creek (L); rises in Eldorado County, in the northern part of T. 11 N., R. 12 E., at altitude 4,000 feet above sea level; flows southwestward 4 miles into Slab Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 2,200 feet. Placerville sheet.

Watson Creek (L); rises in Shasta County, in the southwestern part of T. 30 N., R. 7 W., at altitude 2,600 feet above sea level; flows southeastward 2 miles into Roaring River (tributary to North Fork of Cottonwood Creek and thus through Cottonwood Creek to the Sacramento); fall, 1,400 feet. Red Bluff sheet.

Weaver Lake; Nevada County, southwestern part of T. 18 N., R. 12 E.; outlet northward to stream connecting McMurray Lake with South Fork [of Middle Fork of Yuba River] a tributary of Middle Fork of Yuba River, which flows through Feather River to the Sacramento; elevation, 5,050 feet above sea level. Colfax sheet.

Webber Creek (L); rises in Eldorado County, in the eastern part of T. 10 N., R. 11 E., where it is formed by the junction of its North and South forks. The North Fork rises in the southern part of T. 11 N., R. 13 E., at altitude 4,200 feet above sea level and flows southeastward 10 miles to its junction with the South Fork, descending in this distance 2,100 feet. The South Fork rises in the northwestern part of T. 10 N., R. 13 E., 2 miles southwest of the North Fork at altitude 3,800 feet above sea level and flows southwestward about 4½ miles, then west and northwest 4½ miles to junction with North Fork. The fall of the South Fork above the junction is about 1,800 feet. Below the junction Webber Creek takes a circuitous but in general westerly course to its junction with South Fork American River (tributary through American River to the Sacramento) in the southwestern part of T. 11 N., R. 9 E.; length of Webber Creek below the forks, 20 miles, in which distance the fall is only 1,500 feet. Principal tributaries Chunk, Ringgold, Indian, and Dry creeks. Placerville and Sacramento sheets.

Webber Creek, North and South Forks. See *Webber Creek.*

Webb Canyon Creek (R); rises in Tehama County, in the eastern part of T. 25 N., R. 2 E., on the northern slope of Keefer Ridge, at altitude 3,500 feet above sea level; flows southeastward 3 miles into Big Chico Creek (tributary to Sacramento River; fall, about 1,500 feet. Chico sheet.

Webb Gulch Creek (L); rises in Eldorado County in the central part of T. 11 N., R. 11 E., at altitude 2,400 feet above sea level; flows westward about three-fourths mile into Rock Creek (tributary through South Fork American River to American River and thus to the Sacramento); fall, 800 feet. Placerville sheet.

West Branch, West Fork, etc. See name of Main stream.

Whaler Creek (L); rises in Eldorado County, in the northwestern part of T. 12 N., R. 12 E., on the east slope of Bald Mountain, at altitude 4,000 feet above sea level; takes a general southwesterly course into Rock Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 2,000 feet, tributary Slate Creek. Placerville sheet.

Whiskey Gulch Creek (L); rises in Shasta County in the northern part of T. 33 N., R. 6 W., at altitude 3,000 feet above sea level; flows southward 5 miles into Clear Creek (tributary to Sacramento River) at Stella; fall, 1,900 feet. Red Bluff sheet.

Whiskey Run (L); rises in Placer County, in the western part of T. 13 N., R. 7 E., at altitude 800 feet above sea level; flows northwestward 2¼ miles into Coon Creek, which flows into American Basin; fall, about 500 feet; intermittent. Sacramento sheet.

White Cabin Creek (L); rises in Glenn County, in the northwestern part of T. 21 N., R. 4 W.; flows southeastward into Sheep Corral Creek (tributary to South Fork of Willows Creek, which discharges through Willows Creek to the Colusa Basin); intermittent. Sheet B, Sacramento Valley map.

White Oak Creek (L); rises in Eldorado County, in the southern part of T. 10 N., R. 9 E., on the south slope of Pine Hill, at altitude 1,400 feet above sea level; flows northeastward 3 miles into Dry Creek (tributary through Webber Creek to South Fork of American River and thus through American River to the Sacramento); fall, 400 feet. Placerville sheet.

White Rock Canyon Creek (L); rises in Eldorado County, in the northern part of T. 10 N., R. 11 E., at altitude 2,700 feet above sea level; flows northwestward 3½ miles into South Fork of American River (tributary through American River to the Sacramento); fall, 1,500 feet. Placerville sheet.

White Rock Lake; Nevada County, central part of T. 18 N., R. 14 E., on the south slope of Mount Lola; outlet a stream 2 miles long flowing southwestward into North Creek (tributary to Fordyce Lake, which has outlet through Fordyce Creek to South Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento); elevation, 7,700 feet; fall of outlet, 900 feet. Truckee sheet.

Whitlock Ravine Creek; rises in Plumas County in the northern part of T. 24 N., R. 9 E., at altitude 4,400 feet above sea level; flows southwestward into Spanish Creek (tributary to Indian Creek and thence through North Fork of Feather River to Feather River and into the Sacramento); length, 2 miles; fall, 900 feet. Bidwell Bar and Downieville sheets.

Widow Creek (L); rises in Eldorado County, in the eastern part of T. 11 N., R. 9 E., at altitude 1,300 feet above sea level; flows north of west 2 miles into South Fork of American River (tributary through American River to the Sacramento); fall, 700 feet. Placerville sheet.

Wildcat Creek (L); rises in Tehama County, in the southern part of T. 26 N., R. 1 W., at altitude 1,000 feet above sea level; flows westward about 4 miles into Rio de los Berrendos (tributary through Antelope Creek to Sacramento River); fall, 750 feet, of which 650 feet occurs in 2 miles at head; intermittent; tributary, Little Wildcat Creek. Tehama sheet.

Wildcat Creek, Little (L); rises in Tehama County, in the western part of T. 26 N., R. 1 W., at altitude 1,050 feet above sea level; flows westward 2 miles, then northwestward one-half mile into Wildcat Creek (tributary to Rio de los Berrendos and thus through Antelope Creek to the Sacramento); fall, 750 feet, of which 700 feet occurs in 2 miles at head; intermittent; tributary, Hibbard Gulch Creek. Tehama sheet.

Wilk Gulch Creek (L); rises in Shasta County, in the eastern part of T. 31 N., R. 2 W., at altitude 1,400 feet above sea level; flows northwestward 2 miles into South Fork of Cow Creek (tributary through Cow Creek to Sacramento River); fall, about 800 feet; intermittent. Redding sheet.

Williams Creek (L); rises in Sierra County, in the eastern part of T. 20 N., R. 12 E., at altitude 6,500 feet above sea level; flows northwestward 1½ miles into Deer Creek (tributary through North Fork of North Fork of Yuba River to North Fork of Yuba River and thus through Yuba River to Feather River and the Sacramento); fall, 1,000 feet. Downieville sheet.

Willow Creek (L); Eldorado County; rises in the centra. part of T. 10 N., R. 8 E., 1½ miles east of Mormon Island, at altitude 500 feet above sea level; flows southwestward 6 miles into American River (tributary to the Sacramento) 2 miles southwest of Folsom; fall, 400 feet. Sacramento sheet.

Willow Creek (L); Lassen County; rises in the southwestern part of T. 37 N., R. 10 E., on the northern slopes of Hayden Hill, at altitude (approximate) 5,000 feet above sea level; flows northwestward about 16 miles to its junction with Ash Creek, through which it is tributary to Pit River and thus to the Sacramento; fall, about 900 feet. Alturas sheet.

Willow Creek (R); Plumas County; rises in the western part of T. 23 N., R. 8 E., at altitude 5,500 feet above sea level; flows westward 1½ miles, then irregularly southward 4 miles to junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall, 3,100 feet. Bidwell Bar sheet.

Willow Creek (R); Plumas County; rises in the north central part of T. 23 N., R. 13 E., on the south slope of Grizzly Peak, at altitude 6,500 feet above sea level; flows southwestward about 10 miles to junction with Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall, 2,000 feet, of which 1,500 feet occurs in 1½ miles at head. Downieville sheet.

Willow Creek (R); Plumas County; rises in the southern part of T. 24 N., R. 10 E., at altitude 5,100 feet above sea level; flows southeastward 2½ miles into Middle Fork of Feather River (tributary through Feather River to the Sacramento); fall, 1,100 feet. Downieville sheet.

Willow Creek (L); Plumas County; rises — Willow Lake, on line between Rs. 5 and 6 E., T. 29 N., at altitude 5,500 feet above sea level; flows southeastward 4 miles to North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 900 feet. Lassen Peak sheet.

Willow Creek (R); Shasta County; rises in the western part of T. 32 N., R. 7 W., on the northwest slope of Bally Mountain, at altitude (approximate) 3,000 feet above sea level; flows northward 2 miles, then southeastward 2 miles into Clear Creek (tributary to Sacramento River); fall, about 1,700 feet. Red Bluff sheet.

Willow Creek (R); Shasta County; rises in the central part of T. 33 N., R. 3 W., at altitude 1,300 feet above sea level; flows southward 3 miles into Salt Creek (tributary through Little Cow Creek to Cow Creek and thus to the Sacramento); fall, 700 feet; intermittent. Redding sheet.

Willow Creek (L); Siskiyou County; rises in the southern part of T. 39 N., R. 1 W., at altitude 4,400 feet above sea level; flows westward 6 miles into McCloud River (tributary to Pit River and thus to the Sacramento); fall, 1,700 feet. Shasta sheet.

Willow Creek [Spring Branch] (L); Tehama County; rises in the northern part of T. 25 N., R. 5 W., at altitude 1,000 feet above sea level; flows eastward 11 miles into Elder Creek (tributary to Sacramento River); fall, about 800 feet; intermittent. Red Bluff sheet.

Willow Creek (L); Yuba County; rises near the center of T. 19 N., R. 8 E., at altitude 3,000 feet above sea level; takes an irregular but in general southwesterly course to its junction with the North Fork of Yuba River (tributary to Middle Fork of Yuba River and thus through Yuba and Feather rivers to the Sacramento) at Bul-

lards Bar; length, about 10 miles; fall, 1,500 feet; tributaries, Beaver and Clear creeks. Smartsville sheet.

Willow Creek and Slough; Yolo Basin, 3 miles north of Putah Creek; extends in northwest-southeast direction nearly across the basin. Willow Creek is made up of two forks, North and South, which rise south of Cache Creek and flow southeastward, discharging into Yolo Basin through Yolo Slough. Sheet L, Sacramento Valley map.

Willow Glen Creek (R); rises in Yuba County, near the center of T. 18 N., R. 6 E., at altitude 2,500 feet above sea level; flows southward 4½ miles into Dry Creek (tributary through Yuba River to Feather River and thus to the Sacramento); fall, 1,350 feet.

Willow Lake; Plumas County, on line between Rs. 5 and 6 E., T. 29 N., one inlet; outlet Willow Creek to North Fork of Feather River (tributary through Feather River to the Sacramento). Lassen Peak sheet.

Willows Creek (R); Colusa County; an intermittent stream formed by the flood waters of its North and South forks, which unite near Willows; the stream flows southeastward into the Colusa basin. Sheet B, Sacramento Valley map.

Willows Creek, North Fork (L); rises in Colusa County, in the western part of T. 21 N., R. 3 W., at altitude 200 feet above sea level; flows somewhat east of south to the northeastern part of T. 19 N., R. 3 W., where it unites with the South Fork to form Willows Creek, which discharges into the Colusa Basin. Sheet B, Sacramento Valley map.

Willows Creek, South Fork (R); rises in Glenn County, in the southern part of T. 18 N., R. 5 W.; flows northward about 12 miles, then winds very irregularly eastward to a point near Willows, where it unites with the North Fork to form Willows Creek, which discharges into the Colusa Basin; interm ittent. Sheet B, Sacramento Valley map.

Willow Spring Creek (R); rises in Yolo County in T. 11 N., R. 1 W., at altitude 200 feet above sea level; flows northeastward 4 miles; intermittent; sinks before reaching Colusa Basin.

Wilson Creek (R); rises in Colusa County, in the central part of T. 21 N., R. 4 W., at altitude 280 feet above sea level; flows southeastward about 8 miles; intermittent; at flood stages may unite with the South Fork of Willows Creek (tributary to the Colusa Basin). Sheet B, Sacramento Valley map.

Winchester Lake; Yolo Basin, Yolo County, 2 miles north of Big Lake on the edge of the tidal marsh. Sheet M, Sacramento Valley map.

Wittawakit Creek (R); rises in Shasta County, in the western part of T. 36 N., R. 3 W., on the south slope of Nawtawakit Mountain, 3,300 feet above sea level; flows southward 2 miles into McCloud River (tributary through Pit River to the Sacramento); fall, 2,200 feet; intermittent. Redding sheet.

Wolf Creek (L); Eldorado County; rises in the western part of T. 10 N., R. 15 E., at altitude 6,000 feet above sea level; flows northwestward 5 miles into South Fork of American River (tributary through American River to the Sacramento); Pyramid Peak sheet.

Wolf Creek (R); Lake County; rises in the southeastern part of T. 15 N., R. 7 W., and flows southeastward about 6 miles into North Fork of Cache Creek (tributary through Cache Creek to Yolo Basin). Punnett's map of Lake County.

Wolf Creek (R); Nevada County; rises in the southern part of T. 16 N., R. 8 E., at altitude 2,200 feet above sea level, 1 mile south of Grass Valley; takes an irregular but in general southwesterly course to its junction with Bear River (tributary through Feather River to the Sacramento); length, about 14 miles; fall, 1,100 feet; tributaries, Rattlesnake and South Wolf creek. Smartsville sheet.

Wolf Creek (R); Sierra County; rises in the central part of T. 19 N., R. 10 E., at altitude 5,500 feet above sea level; flows southwestward into Middle Fork of Yuba River (tributary through Feather River to the Sacramento); length, 4 miles; fall, 2,400 feet. Colfax sheet.

Wolf Creek, Little (R); rises in Nevada County, in the eastern part of T. 14 N., R. 7 E., at altitude 1,500 feet above sea level; flows irregularly southwestward into Bear River (tributary through Feather River to the Sacramento); length, about 7 miles; fall, 1,000 feet. Smartsville sheet.

Wolf Creek, South (L); rises in Nevada County, in the northwestern part of T. 15 N., R. 9 E., at altitude 2,700 feet above sea level; flows southwestward 10 miles into Wolf Creek (tributary through Bear River to Feather River and thus to the Sacramento); fall, 1,500 feet. Smartsville sheet.

Wolf Creek (R); rises in Plumas County, in the northern part of T. 27 N., R. 8 E., on the south slope of Mount Dyer (altitude 5,000 feet above sea level); flows southeastward 8 miles to Greenville, then eastward 4 miles, discharging into the swampy area just north of Indian Creek (tributary to North Fork of Feather River and thence through Feather River to the Sacramento); total fall, 1,500 feet; principal tributary, North Canyon Creek, which flows from Round Valley reservoir. Honey Lake sheet and Indian Valley special map.

Woodman Creek (R); rises in Shasta County, in the central part of T. 33 N., R. 2 W., at altitude 1,500 feet above sea level; flows southwestward about 6 miles into Little Cow Creek (tributary through Cow Creek to the Sacramento); fall, about 900 feet; intermittent. Redding sheet.

Woodruff Creek (L); rises in Sierra County, in the western part of T. 19 N., R. 10 E., at altitude 4,500 feet above sea level; flows northward into Rock Creek (tributary to North Fork of Yuba River, which flows through Middle Fork of Yuba and Yuba rivers to Feather River and thus to the Sacramento) at Goodyears Bar; length, 4 miles; fall, 1,900 feet. Downieville sheet.

Woodville Creek (R); rises in Yuba County, in the central part of T. 19 N., R. 7 E., at altitude 3,600 feet above sea level; flows southeastward about 5 miles into North Fork of Yuba River (tributary through Middle Fork of Yuba River to Yuba, Feather, and Sacramento rivers); fall, 1,500 feet. Smartsville sheet.

Wrights Lakes; Eldorado County, in the southwestern part of T. 12 N., R. 16 E., just north of Blakeley; inlet, a stream from the east flowing from the northern slopes of Pyramid Peak; outlet a stream 2½ miles long flowing south then southwest into South Fork of Silver Creek (tributary through Silver Creek to South Fork of American River and thus through American River to the Sacramento); altitude, 6,950 feet; fall of outlet, about 400 feet; 2 small connected lakes. Pyramid Peak sheet.

Wyandotte Creek (R); rises in Butte County, in the northeastern part of T. 18 N., R. 4 E., one-half mile west of Wyandotte, at altitude 600 feet above sea level; flows southwestward to Central House, then somewhat east of south to its junction with North Honcut Creek (tributary through Honcut Creek to Feather River and thus to the Sacramento); length, 14 miles; the fall, somewhat more than 500 feet, occurs almost entirely in the 4 miles at the head of the stream, the fall in the lower 10 miles being exceedingly small. Smartsville and Marysville sheets.

Yankee John Ravine Creek (R); rises in Eldorado county, in the western part of T. 11 N., R. 12 E., at altitude 3,000 feet above sea level; flows southeastward 1 mile into Slab Creek (tributary through South Fork of American River to American River and thus to the Sacramento); fall, 1,000 feet. Placerville sheet.

Yellow Creek (R); rises in Plumas County in the extreme northwestern part of T. 26 N., R. 6 E. at altitude 6,000 feet above sea level; flows eastward about 8 miles then southward 12 miles into the North Fork of Feather River (tributary through Feather River to the Sacramento); fall, 4,000 feet. Lassen Peak sheet.

Yolo Basin; west side Sacramento River from Grafton on the north to Cache Slough on the south; length 40 miles; average width 7 miles; capacity in times of general flood, when its water surface slopes from north to south at the rate of 4 to 6 inches per mile, about 50,000,000,000 cubic feet, an amount which might be exceeded if inflow of water from above was sufficiently rapid.

Yolo Basin has outlet into Sacramento River at the lower end of Grand Island and becomes a steady flowing sea in times of general floods. Cache and Putah sloughs and minor streams from the Coast Range south of Cache Creek discharge into this basin. About 90 square miles of the bottom of Yolo Basin is less than 10 feet higher than the low water of Suisun Bay, and the lowest portion of it is always covered with water (Big Lake).

Yolo Basin, like some of the others, begins to receive water from the river long before the river is bank full. The tides ebb and flow through Cache Slough, the rise and fall ranging from nearly 6 feet at low water to about 1 foot at extreme flood stages. At every rise of the river the quantity of water in the basin is increased, and when the river reaches its ordinary flood stage, even before it overtops its banks, Yolo Basin is full to the level of river water at the foot of Grand Island.

Sheets I to P, Sacramento Valley map. Report of the Examining Commission on Rivers and Harbors to the Governor of California (C. T. Reed, C. E. Grunsky, J. J. Crawford, commissioners), Sacramento, 1890, p. 67.

Young America Lake; Sierra County, central part of T. 20 N., R. 12 E.; outlet Sardine Creek, which flows through Upper and Lower Sardine Lakes to the stream connecting Lower Salmon Lake with North Fork of North Fork of Yuba River (tributary through North Fork of Yuba River to Yuba River and thus through Feather River to the Sacramento); elevation above sea level 6,700 feet; above Upper Sardine Lake 600 feet; above Lower Sardine Lake 800 feet. Downieville sheet.

Yuba River (L); rises near the crest of the Sierra Nevada in the central part of Nevada County; flows southwestward to its junction with Feather River at Marysville; extreme length of the basin from the mouth of the river to the crest of the Sierras about 70 miles; greatest width, 35 miles; drainage area, more than 1,300 square miles. The river is formed by 3 principal forks; Middle, North and South. The Middle Fork, which drains a larger area and may therefore be considered the continuation of the main stream, rises in Sierra and Nevada counties on the west and south slopes of Webber Peak, in Ts. 18 and 19 N., Rs. 13 and 14 E., and takes a general southwesterly course. The Middle Fork forms a boundary between Sierra and Nevada counties. It receives the North Fork in Yuba County in the northeastern part of T. 17 N., R. 7 E., and the South Fork in Nevada County in the southwestern part of T. 17 N., R. 7 E.

The topography of the Yuba basin is rugged and mountainous. From the edge of the Sacramento Valley the surface rises gently through the foothills and then more abruptly through rounded and broken mountains to the crest of the Sierras which along the Yuba-Truckee divide has a mean elevation of about 8,000 feet and a few peaks exceeding 9,000 feet. The streams have cut deep canyons which head well up in the mountains. All the principal part of the basin, comprising more than 800 square miles, is now included in a national forest.

The mean annual precipitation ranges from 18 inches at the mouth of the river at Marysville to about 70 inches near the crest of the mountains. In the upper and central parts of the basin the precipitation ranges from 50 to 70 inches and occurs principally as snow which remains on the ground all winter and well into the summer. Perennial springs are found in different parts of the basin, principally along the North Fork.

Yuba River in 1849 and before that time was a clear-water stream and occupied a bed deep below the surface of the flanking bottom lands. Up to 1862 the Yuba was navigable all the year for ships and boats drawing 9 or 10 feet of water. As the result of hydraulic mining the bed of the Yuba River was gradually built up by successive deposits of débris, and in 1868 the people of Marysville found it necessary to build levees to protect the city from overflow. The river bed continued to rise after the building of the levees, and during the flood of 1875 the levees broke and for the first time in its history Marysville was inundated. The bed of the river has been raised from about 11 feet at its mouth to about 80 feet at Smartsville, 20 miles upstream.

For 10 miles above the mouth the levees are 1 to 2½ miles apart, the space between being covered with débris; the material in each ranges from cobblestones at Smartsville to a mixture of sand and clay with some gravels in the main channels at the junction with Feather River. An attempt has been made to restrain this débris from moving downstream by building barrier dams, but it has not been successful.

Surveys and data: Truckee, Downieville, Colfax, Smartsville, Bidwell Bar and Marysville sheets; reports of California Débris Commission; reports on the control of floods in the river systems of the Sacramento Valley and the adjacent San Joaquin Valley, California (House Doc. 81, Sixty-second Cong., first sess).

Yuba River, Middle Fork, South Fork of (L); rises in Nevada County in the southeastern part of T. 19 N., R. 12 E., on the west slope of Findley Peak, at altitude 7,000 feet above sea level; flows westward into Middle Fork of Yuba River (tributary through Yuba River to the Feather and thus to the Sacramento); length 6 miles; fall 3,000 feet.

Yuba River, North Fork (R); formed in Sierra County by the union of North and South forks. The North Fork, here considered the master stream, rises 2 miles northeast of Summit House at altitude 7,300 feet above sea level; takes a circuitous but in general southwesterly course to its junction with the South Fork, 1 mile east of Sierra City in the southern part of T. 20 N., R. 12 E. From this junction the North Fork of the Yuba flows almost directly west to Downieville whence its course is in general southwestward to its junction with the Middle Fork of the Yuba, 2 miles west of North San Juan. From the head of the North Fork of the North Fork to the junction with the Middle Fork the distance is about 50 miles and the fall is 6,000 feet. Downieville, Bidwell Bar, and Smartsville sheets.

Yuba River, North Fork, East Fork of (L); rises in Sierra County, in the eastern part of T. 21 N., R. 11 E., in Lake Hawley, at altitude 6,700 feet above sea level; flows southwestward into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba to Middle Fork of Yuba, and thus through Yuba River to Feather River and the Sacramento), Downieville branch; length, 12 miles; fall, 3,700 feet; tributaries, Butcher Ranch and Hog Canyon creeks. Downieville sheet.

Yuba River, North Fork, Middle Fork of (L); rises in Sierra County, in the northern part of T. 21 N., R. 11 E., in Spencer Lakes, at altitude 6,800 feet above sea level; flows southwestward into North Fork of North Fork of Yuba River (tributary through North Fork of Yuba to Middle Fork of Yuba and thus through Yuba River to Feather River and the Sacramento), Downieville branch; length, 14 miles; fall, 3,800 feet. Downieville sheet.

Yuba River, North Fork, North Fork of (R); rises in Sierra County, in T. 21 N., R. 10 E., near Deadwood, at altitude 6,100 feet above sea level; flows southward into North Fork of Yuba River (tributary to Middle Fork of Yuba and thus through Yuba River to Feather River and the Sacramento) at Downieville. Another stream called "North Fork of North Fork of Yuba River" unites with South Fork of North Fork of Yuba near Sierra City to form the North Fork of Yuba River. The North Fork of the North Fork of Yuba River which enters at Downieville has two large tributaries, called the Middle Fork of the North Fork and the East Fork of the North Fork. The nomenclature of these forks of the Yuba is very complex and confusing and is incomprehensible without constant reference to the map. The Downieville North Fork of North Fork of Yuba is about 7 miles long and falls 3,600 feet; gaging station at Downieville, 1910–11. Downieville sheet.

Yuba River, North Fork, South Fork of (L); rises in Sierra County, in the northwestern part of T. 19 N., R. 14 E., at altitude 7,700 feet above sea level; flows northwestward to junction with North Fork of Yuba River (tributary through Middle Fork of Yuba to Yuba River, and thus through Feather River to the Sacramento) just east of Sierra City; length, 12 miles; fall, 3,300 feet. Sierraville and Downieville sheets.

Yuba River, South Fork (L); rises in Nevada and Placer counties on the west slope of the Sierra Nevada, the headwaters consisting of many small branching streams flowing from the west slopes of Mount Lincoln, Donner Peak, and Castle Peak. The elevation of this portion of the crest of the Sierra exceeds 8,000 feet above sea level, Castle Peak rising to an altitude of 9,139 feet, Donner Peak to 8,315 feet, and Mount Lincoln to 8,403 feet. From Donner Pass the course of the South Fork of the Yuba is in general westerly to its junction with the Middle Fork of Yuba River (tributary through Feather River to the Sacramento), 2 miles west of Bridgeport in Nevada County. The length of the stream, including the major windings, is about 60 miles. The total fall from the crest of the Sierra to Yuba River is about 7,500 feet; total fall from Donner Pass to Yuba River is 6,500 feet. The basin is comparatively narrow, the tributary streams are short and most of them enter the Yuba through deep canyons. The upper part of the basin contains numerous lakes. Truckee, Colfax, and Smartsville sheets.

Zamora Creek (R); rises in Yolo County in T. 11 N., R. 1 W., south of Britona Creek; flows northeastward about 2½ miles; intermittent; sinks before reaching Colusa Basin. Dunnigan sheet.

Zummershed Creek (R); rises in Tehama County, in T. 24 N., R. 1 E., at altitude 3,000 feet above sea level; flows southwestward about 11 miles into Pine Creek (tributary to Sacramento River); fall, 2,700 feet. Chico sheet.

56378°—WSP 295—12——7*

GAGING STATIONS MAINTAINED IN THE SACRAMENTO RIVER BASIN FROM 1888 TO JULY 1, 1912.

The following list comprises the gaging stations that have been maintained in the Sacramento River basin. Stream-flow data for these stations are published in Water-Supply Paper 298. (See p. 3.) The stations are arranged in downstream order, tributaries being indicated by indention. A dash following the date implies that the station was being maintained July 1, 1912:

Sacramento River at Castella, 1910–
Sacramento River at Antler, 1910–
Sacramento River at Jellys Ferry, 1895–1902.
Sacramento River near Red Bluff, 1902–
Sacramento River at Red Bluff, 1894–1896.
Sacramento River at Collinsville, 1878–1885.
Sacramento River at Sacramento, 1904–5.
  Pit River near Canby, 1904–5.
  Pit River near Bieber, 1904–1908.
  Pit River at Henderson, 1910–
  Pit River near Ydalpom, 1910–
    Cottonwood Creek near Lakeview, Oreg., 1908–
    Drews Creek near Lakeview, Oreg., 1909–
    South Fork of Pit River near Ivy, 1904–5.
      West Valley Creek near Likely, 1904–5.
    Ash Creek at Adin, 1904–5.
    Fall River at Fall River Mills, 1912–
    Hat Creek at Hawkin's Ranch, 1911–
    Hat Creek at Hat Creek, 1910–
      Rising River[1] near Cassel, 1911–
    Burney Creek near Burney, 1911–
    Kosk Creek near Henderson, 1910–
    Montgomery Creek at Montgomery Creek, 1911–
    Squaw Creek near Ydalpom, 1910–
    McCloud River near Gregory, 1902–1908.
    McCloud River at Baird, 1910–
  Clear Creek near Shasta, 1911–
  Cow Creek at Millville, 1911–
    Clover Creek at Millville, 1911–
    Little Cow Creek near Palo Cedro, 1911–
  Bear Creek near Millville, 1911–
  North Fork of Cottonwood Creek at Ono, 1907–
  Mill Creek near Los Molinos, 1909–
  Deer Creek near Vina, 1911–
  Stony Creek near Fruto, 1901–
    Little Stony Creek near Ladoga, 1907–

[1] Rising River is a small spring-fed stream (unnamed on the maps and therefore not described in the gazetteer) that enters Hat Creek from the east just south of Cassel.

Sacramento River—Continued.
North Fork of Feather River [head of Feather River] above Prattville, 1905–1907.
North Fork of Feather River below Prattville, 1905–
North Fork of Feather River near Big Bend, 1905–
Feather River at Oroville, 1902–
Hamilton Branch near Prattville, 1905–1907.
Butt Creek at Butte Valley, 1905–
Indian Creek near Crescent Mills, 1905–1909, 1911–
Spanish Creek near Keddie, 1911–
Middle Fork of Feather River at Cromberg, 1910–
Middle Fork of Feather River near Oroville, 1911–
Grizzly Creek near Beckwith, 1905–6.
South Fork of Feather River at Enterprise, 1911–
Palermo Land & Water Co.'s canal, 1911–
Middle Fork of Yuba River [head of Yuba River] at Freeman's bridge, near North San Juan, 1900–
Middle Fork of Yuba River near North San Juan, 1910–
Yuba River near Smartsville, 1903–
Yuba River at Parks Bar bridge near Smartsville, 1900–
Oregon Creek (tributary to Middle Fork of Yuba) near North San Juan, 1910–
North Fork of Yuba River near Sierra City, 1911–
North Fork of Yuba River at Goodyear Bar, 1910–
North Fork of Yuba River near North San Juan, 1900–
North Fork of North Fork of Yuba River at Downieville, 1910–
Rock Creek at Goodyear Bar, 1910–
Goodyear Creek at Goodyear Bar, 1910–
Bear River near Colfax, 1911–
Bear River at Van Trent, 1904–
North Fork of American River [head of American River] near Colfax, 1911–
American River at Fairoaks, 1904–
Middle Fork of American River near East Auburn, 1911–
Rubicon River at Rubicon Springs, 1910–11.
Rubicon River near Quintette, 1909–1911.
Little Rubicon River near Rubicon Springs, 1910–11.
Little South Fork of Rubicon River at sawmill near Quintette, 1910–11.
Little South Fork of Rubicon River below Gerlé Creek, near Quintette, 1910–11.
Little South Fork of Rubicon River at mouth, near Quintette, 1909–1911.
Little South Fork ditch at sawmill near Quintette, 1910–11.
Gerlé Creek near Rubicon Springs, 1910–11.
Pilot Creek near Quintette, 1910–11.
Pilot Creek ditch near Quintette, 1910–11.
South Fork of American River at Kyburz, 1906–7.
South Fork of American River near Kyburz, 1906.
South Fork of American River below Kyburz, 1907.
South Fork of American River near Placerville, 1911–
Clear Lake in Lake County, 1874–1900.
Cache Creek at Lower Lake, 1901–
Cache Creek at Yolo, 1903–
Putah Creek near Guenoc, 1904–1906.
Putah Creek at Winters, 1905–