UNITED STATES DEPARTMENT OF THE INTERIOR Ray Lyman Wilbur, Secretary GEOLOGICAL SURVEY George Otis Smith, Director

Bulletin 812

CONTRIBUTIONS TO ECONOMIC GEOLOGY

(SHORT PAPERS AND PRELIMINARY REPORTS)

ł.

Ż

Ę

1929

PART II.-MINERAL FUELS

H. D. MISER GEOLOGIST IN CHARGE



GANGELLED.

UNITED STATES GOVERNMENT PRINTING OFFICE WASHINGTON: 1930



[The	letters in parentheses preceding the titles are those used to designate the papers for a	advance
	publication	Page
(A)	The Forsyth coal field, Rosebud, Treasure, and Big Horn Counties,	, C
. ,	Mont., by C. E. Dobbin	1
(B)	The Kevin-Sunburst oil field and other possibilities of oil and gas in	
	the Sweetgrass arch, Mont., by A. J. Collier	57
(C)	Geology and coal resources of the Meeker quadrangle, Moffat and	
	Rio Blanco Counties, Colo., by E. T. Hancock and J. B. Eby	191
(D)	Geology and oil resources along the southern border of San Joaquin	
```	Valley, Calif., by H. W. Hoots	243
	Index	333

### ILLUSTRATIONS

		Page
Plate	<ol> <li>Index map showing location of Forsyth coal field, Montana</li> <li>A, Light-colored sandstone and brown sandy shale at the top</li> </ol>	2
	of the Judith River formation, near Finch, Mont.; B, Escarp-	
	ment of the Tullock member of the Lance formation, on	
	Armells Creek, T. 5 N., R. 40 E., Montana	2
	3. A, Lebo shale member of the Fort Union formation overlain by	
	the Tongue River member, sec. 31, T. 5 N., R. 41 E., Mon-	
	tana; B, Big Dirty coal bed at the base of the Lebo shale	
	member of the Fort Union formation, $SW. \frac{7}{4}$ sec. 31, 1.3 N., P $d1$ F Montane	9
	A A West side of the Wolf Mountains from the east quarter	4
	corner sec 25 T 1 N R 38 E. Montana: B View in sec 13	
	T. 3 N., R. 40 E., Montana,	2
	5. A, Massive sandstone above the Rosebud coal bed, sec. 13, T.	-
	1 N., R. 41 E., Montana; B, Outcrop of the Rosebud coal bed	
	in the North Coal Bank Coulee, sec. 24, T. 1 N., R. 41 E.,	
	Montana	18
	6. A, View in sec. 31, T. 2 N., R. 40 E., Montana; B, Prospect on	
	outcrop of the Rosebud coal bed in South Coal Bank Coulee,	
	SE. ¼ sec. 15, T. 1 N., R. 41 E., Montana	18
	7. Map of the Forsyth coal field, Montana, showing areal geology	alrat
	8 Stratigraphic sections of the Lance and Fort Union formations	cket.
	in the Forsyth and Tullock Creek fields. Montana, showing	
	position and correlation of the coal beds	26
	9. A, B, Strip pit of the Northwestern Improvement Co. at Col-	_,2
	strip, Mont	26
	10. Sections of coal beds in the Forsyth coal field, Montana In po	cket.

ш

			Page
Plate	11.	Unconformity between the Madison and Ellis formations as	69
	19	A The weathered and channeled surface of the Madison	00
	12.	limestone as exposed about 1 mile north of Stockett Mont :	
		B Blackloof sandy member of the Colorado shale on south	
		side of Missouri River near Carter Ferry Mont	68
	12	4 Clay of a glacial lake had locally distorted by a later glacial	00
	10.	overthrust north side of Teton River near Shannon Bridge	
		Mont $\cdot B$ Virgelle sandstone exposed about 11 miles west	
		of Sunhurst Mont	68
	14	A Four "discovery" nits dug near a section corner in accord-	00
		ance with the provisions for land location under the placer-	
		mining law: B. Miniature anticline in the Blackleaf sandy	
		member of the Colorado shale	68
	15.	Structure map of the Sweetgrass arch, Mont	84
	16.	Structure contour map of the Kevin-Sunburst oil field. Mont-	84
	17.	Logs of 15 wells in the Kevin-Sunburst oil field, Mont., and	
		the region south of it	84
	18.	Analyses of waters associated with the oil in the Kevin-Sun-	
		burst field, Mont	84
	19.	Topographic and geologic map of the Meeker quadrangle,	
		Colo., with structure cross sections In p	ocket.
	20.	A, Escarpment formed by the lower beds of the Iles formation,	
		looking northeast from Sulphur Creek, Colo.; B, Thin-bedded	
		sandstone in Mancos shale, sec. 1, T. 1 N., R. 94 W., Colo-	202
	21.	A, Trout Creek sandstone at the "Transfer," Colo.; B, Jointing	
		in thin-bedded sandstone immediately above the Trout	
		Creek sandstone at the "Transfer"	202
	22.	A, Trout Creek sandstone in sec. 10, T. 2 N., R. 94 W., Colo.;	
		B, Sandstone at base of Wasatch formation at Valentine	
	~~	ranch, secs. 7 and 8, T. 2 N., R. 94 W., Colo	202
	23.	A, Terrace extending east from Meeker, Colo., along the south	
		side of White River; B, Sulphur Creek syncline as observed	
		from the "Transfer," Colo.; C, Lion Canyon sandstone in the	
	~ .	Sulphur Creek syncline, sec. 23, T. 2 N., R. 94 W., Colo	202
	24.	Stratigraphic sections of Black Diamond, Fairfield, Goff, and	
		Lion Canyon coal groups in the Meeker quadrangle, Colo.,	000
	95	showing intervals between and thicknesses of coal beds	202
	29.	Colo: P Montromovy mine NW 1/ sec. 20 T 1 N D 04	
		W Colo	226
	26	Soutions of each hade measured in T 1 S P 04 W and T 1	220
	20.	N P 04 W Colo	226
	97	Sections of coal hads measured in T 2 N Bs 04 and 05 W	220
	21.	Colo	234
	28	Sections of coal beds measured in T 3 N Bs 94 and 95 W	201
	-0.	Colo	234
	29.	Sections of coal beds measured in T. 3 N., Rs. 92 and 93 W.,	
		Colo	234
	30.	Sections of coal beds measured in T. 2 N., Rs. 92 and 93 W.,	
		Colo	234

. . . . . . . .

		Page
PLATE 31.	Geologic map and structure sections of the foothills along the	
	southern and southeastern border of San Joaquin Valley,	
	Kern County, Calif In po	ocket.
32.	A, Eocene sandstone and conglomerate of probable Meganos	
	age, Kern County, Calif.; B, Bentonite beds in the Tejon	
	formation	252
33.	A, Coarse Vagueros sediments and basalt agglomerate between	
	Salt and Tecuva Creeks: B. Basalt agglomerate or flow	
	breccia in Vagueros just west of Pastoria Creek	252
34.	A. Conglomeratic sandstone of <i>Turritella ocovana</i> zone in the	
	Teion Hills: B. Well-rounded cobbles of the sandstone	
	shown in $A : C$ Angular and subangular rock fragments.	
	typical of the Santa Margarita and Chanac formations in	
	the Teion Hills	268
35	A Unconformity between white weathering Maricona shale	200
00.	A, Oncombring Detween white-weathering Mancopa Shale	
	and overlying Electegoin hear Muduy Oreek, D, Banta Mar-	000
0.0	garita and Chanac formations in the Tejon Hills	268
. 30.	A, lulare and Etcnegoin sediments on the north hank of	
	Wheeler Ridge; B, Unconformity between overturned Tulare	
	strata and overlying tilted Pleistocene alluvial-ian deposits	000
0.	I mile west of San Emigdio ranch	292
37.	A, Unconformity on Wheeler Ridge between Tulare and over-	
	lying tilted Pleistocene alluvial-fan deposits; B, Coarse in-	
	distinctly bedded Chanac sediments in the Tejon Hills	292
38.	A, Stream terraces along San Emigdio Canyon; B, Stream	
	terrace along San Emigdio Canyon and its relation to mature	
	physiographic surface of the upland	<b>292</b>
39.	A, Terrace remnants of Pleistocene alluvium high on north	
	flank of Wheeler Ridge; B, High Pleistocene stream terrace	
	deposits in lower Grapevine Canyon	292
40.	A, Small landslide of Etchegoin clay on the floor of San Joaquin	
	Valley just east of San Emigdio Canyon; B, One of the land-	
	slides on the north flank of Wheeler Ridge; $C$ , Mammillary	
	solifluxion features along north edge of San Emigdio foot-	
	hills, near Pleito Creek	<b>293</b>
41.	Sketch map showing structural features in Tertiary rocks along	
	southern and southeastern border of San Joaquin Valley and	
	the relation which this belt has to adjoining major structural	
	provinces	300
42.	A, Devils Kitchen syncline, in San Emigdio Canyon, as seen	
	from the west; $B$ , Wheeler Ridge as seen looking north from	
	the top of the Pleito Hills	300
43.	Structure contour map of Wheeler Ridge	300
44.	Structure section across central part of Wheeler Ridge	316
45.	Drainage map of the Wheeler Ridge area	<b>316</b>
46.	A, Tejon Hills as seen from the north; $B$ , Producing oil field	
	on top of Wheeler Ridge	316
47.	Airplane view looking southeastward along the axis of the	
	Wheeler Ridge anticline	324
48.	Airplane view of the southern border of San Joaquin Valley	
	from San Emigdio Canvon to Coaloil Canvon	324

V

			Page
FIGURE	1.	Heating value of coal from the Forsyth field, Montana, and some other coals	32
	2.	Log of the California Co.'s well in sec. 25, T. 26 N., R. 5 W., near Agawam, Mont	84
	3.	Arrangement of wells in a section and letters used in table to indicate their location, Kevin-Sunburst oil field, Montana	93
	4.	Decline in production of three leases in the Kevin-Sunburst oil field, Montana	170
	5.	Index map showing the relation of the Meeker quadrangle, Colo., to the main Yampa coal field and to possibly competing fields	193
	6.	Diagram illustrating relation between surface area and area of underlying inclined coal beds	225
	7.	Index map of southern California, showing oil fields considered in reports published by the United States Geological Survey_	244
	8.	Unconformity between sandstone of the lower part of the Vaqueros and overlying breccia and basalt flows	265
	9.	Map showing probable subsurface structure of Wheeler Ridge producing area, Calif	326

محمد وأراده