UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STRATIGRAPHIC SECTIONS AND PHOSPHATE ANALYSES OF PERMIAN ROCKS IN THE TETON RANGE AND PARTS OF THE SNAKE RIVER AND GROS VENTRE RANGES, IDAHO AND WYOMING

By W. C. Gere, E. M. Schell, and K. P. Moore

Open-file report
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INTRODUCTION

This report summarizes rock descriptions and sample analyses obtained from 24 localities in the northeastern part of the western phosphate field. The field study is part of a geologic program of the Conservation Division, U.S. Geological Survey, to support mineral land classification of phosphate withdrawals outstanding on Federal lands. Descriptions of stratigraphic units and sample collections were made jointly with geologic mapping projects during the field seasons of 1961-63 (pl. 1). The report also augments the stratigraphic and analytical data of previous workers in this region. Plate 1 shows the localities sampled during this investigation as well as localities sampled and described by previous workers. Gardner (1944) mapped and sampled some of the phosphate deposits in the Big Hole Mountains and parts of the Snake River and Teton Ranges. Sheldon (1963) provides a comprehensive discussion of the physical stratigraphy and mineral resources of the Permian rocks in western Wyoming and part of Idaho and includes a tabulation of most of the information gathered by the U.S. Geological Survey and others available at that time. The data is presented in condensed form and without interpretation.

In addition to Gere and Schell, the following people participated in describing and sampling the Permian rocks in the report area: H. F. Albee, E. H. Pampeyan, H. L. Smith, E. R. Cressman, H. L. Cullins, Jr., and M. L. Schroeder. During 1961 the hand excavations were made by R. R. Carlson, D. M. Kinney, Jr., and Frederick Sass III. R. K. Stewart and J. R. Osmond did the trenching in 1962 and 1963. Chemical analyses were made by K. P. Moore in the U.S. Geological Survey Laboratory, Casper, Wyo. Semiquantitative spectrographic analyses of samples from the Snow King Mountain locality (CP-14) were made in the Geological Survey Laboratory in Denver, Colo., under L. B. Riley, coordinator, J. C. Hamilton, analyst, and A. T. Myers, project leader. Oil-yield analyses of selected carbonaceous rock samples were made by the U.S. Bureau of Mines, Laramie Petroleum Research Center, Laramie, Wyo., under the supervision of John Ward Smith; the samples, however, contained only trace amounts or no oil, and these analyses are omitted in this report.

ACKNOWLEDGMENTS

The aid and cooperation of many people implemented this study. V. E. McKelvey and R. A. Gulbrandsen of the U.S. Geological Survey contributed helpful suggestions and discussed problems relating to phosphate trenching and sampling prior to the start of these investigations. Those in charge of the geological mapping projects were helpful in the location of rock exposures and sample localities. U.S. Forest Service and National Park Service personnel extended helpful assistance and cooperation. Last, but not least, the considerate response of the several surface owners is gratefully acknowledged.

FIELD AND LABORATORY PROCEDURES

The field investigation was to accumulate stratigraphic and analytical information necessary for mineral-land classification--the grade, thickness, and areal continuity of the phosphate-bearing rocks. The general procedure used was essentially that of previous workers in the phosphate field (McKelvey and others, 1953, p. 1-6).

Rocks at 24 localities were selected for sampling to augment phosphate data available from other sources (fig. 1), and the localities were spaced to maintain regional continuity insofar as possible. Bulldozers were utilized at three localities, cutting the rocks to depths of as much as 20 feet. At the remaining sites the rocks were hand trenched because of the restrictions imposed by the terrain and other factors. The maximum depth of hand trenches was about 11 feet. Owing to the depth of cover of the relatively incompetent phosphatic rocks, it was possible at only a few places to expose the entire phosphatic section by hand-trenching methods. At all sites an attempt was made to uncover the upper and lower parts of the phosphatic shale members which generally contain the major concentrations of phosphate. The rest of the Permian and adjacent rocks were described along Jacob staff or tape and Brunton traverses. The rocks examined and sampled were mostly in the weathered zone where phosphate enrichment may be expected. Thus, the thickness and analyses of the units may not be representative of the rocks at depth.

A letter-number assignment has been made for each locality investigated. The letters "CP" designate a U.S. Geological Survey Conservation Division phosphate sample site, and each locality is numbered in sequence starting with Talbot Creek, Wyo., CP-1. Channel samples of phosphatic rock intervals 1 foot or more thick were cut from each trench, except for certain key zones where rocks of lesser thickness were also sampled. With few exceptions, a channel sample did not

exceed 3 feet in thickness. Each sample appears in numerical sequence of collection prefaced by the locality number. During the compilation of the results of the fieldwork it was noted that additional analyses of unsampled units would be beneficial to an evaluation of phosphate concentration at some localities. These additional analyses are from chip samples only and they are identified as such in the tabular data.

Individual beds or groups of beds are assigned unit numbers from base to top. The numbers are preceded by a letter designation to indicate the formation to which it belongs: T, Tensleep Sandstone of Pennsylvanian age; W, Grandeur Member of the Park City Formation and upper part of the Wells Formation, undifferentiated of Permian age; P, formations of Phosphoria age; D, Dinwoody Formation of Triassic age.

Rock names in the stratigraphic sections are restricted to a rock noun for the dominant component and adjectives to identify other components that exceed about 20 percent of the rock. The nouns and adjectives used follow those of Sheldon (1963, p. 57) with some modification:

Phosphorite, phosphatic--pelletal, nodular, oolitic, pisolitic, or bioclastic (skeletal) apatite.
Mudstone, argillaceous--clay and finely divided quartz.
Siltstone, silty--silt-size detritus, mostly quartz.
Sandstone, sandy--quartz sand.
Dolomite, dolomitic.
Limestone, calcareous.
Carbonate rock, carbonatic--dolomite and calcite undifferentiated.
Chert, cherty, siliceous.

The rock names are field identifications supplemented by microscope examination of chip samples and comparison with analytical data. Detailed descriptions of the rock units will be presented in subsequent reports.

All samples were crushed in the field to minus 1/8-inch mesh by use of a trailer-mounted jaw crusher. The crushed sample was split with a Jones splitter. One split was sent to the laboratory and another was retained and stored for future use.

Chemical analyses of the samples were initially restricted to P_2O_5 (the primary objective of the investigation) and acid insoluble content. Because of interest in the recovery of vanadium from ferrophosphorus slag, selected samples were analyzed for V_2O_5 and Cr_2O_3. Semiquantitative spectrographic analyses for 62 elements were made on samples from Snow King Mountain, Wyo., trench CP-14 (table 1).

No attempt was made during the investigation to detect local anomalous concentrations of iron oxide and alumina, which impurities in excessive amounts impose problems in processing the phosphate deposits. A statistical study by Gere of alumina and iron-oxide content in phosphatic rocks of the western field indicates that there is a predictable association, the expected inverse relationship, of these compounds with phosphorus-pentoxide content. The results of the study of data from 24 localities in Montana, Wyoming, Idaho, and Utah are shown in figure 1. Deviations from the norm are greater in the medium (24-31 percent P_2O_5) and low-grade (18-24 percent P_2O_5) phosphate rocks.

The procedure followed for P_2O_5 analyses is the one described by Hoffman and Lundell (1938). The acid insoluble fraction consists of rock material not soluble in aqua regia and neither combustible nor volatile at temperatures of about 1,000° C. Oil-yield assays performed by the U.S. Bureau of Mines were made by the modified Fischer retort method.

For information on the chemical and physical environment, the reader is referred to publications by Sheldon (1959, 1963) and Gulbrandsen (1960).

NOMENCLATURE OF ROCKS OF THE PHOSPHORIA FORMATION AND EQUIVALENTS

In this report the nomenclature established by McKelvey and others (1959) has been used. Sheldon (1963) provides a comprehensive discussion of the nature and distribution of the stratigraphic subdivisions throughout the area of this investigation. Further discussion and review of the stratigraphy is beyond the scope of this report. A generalized nomenclature chart of the somewhat contrasting Permian stratigraphic sections in the Snake River Range and in the Teton and western Gros Ventre Ranges is presented in figure 2 for guidance in reviewing the tabular data that follow. The chart reflects the complex intertonguing of rock types of three formations: (1) the phosphorite, chert, and fine-grained clastic rock of the Phosphoria Formation; (2) the carbonate rock of the Park City Formation; and (3) the sandstone of the Shedhorn Sandstone. Deciphering the complex intertonguing relationships in this region is complicated because movement along the Jackson and Cache thrust faults has juxtaposed the contrasting stratigraphic sections (A, B, fig. 2).

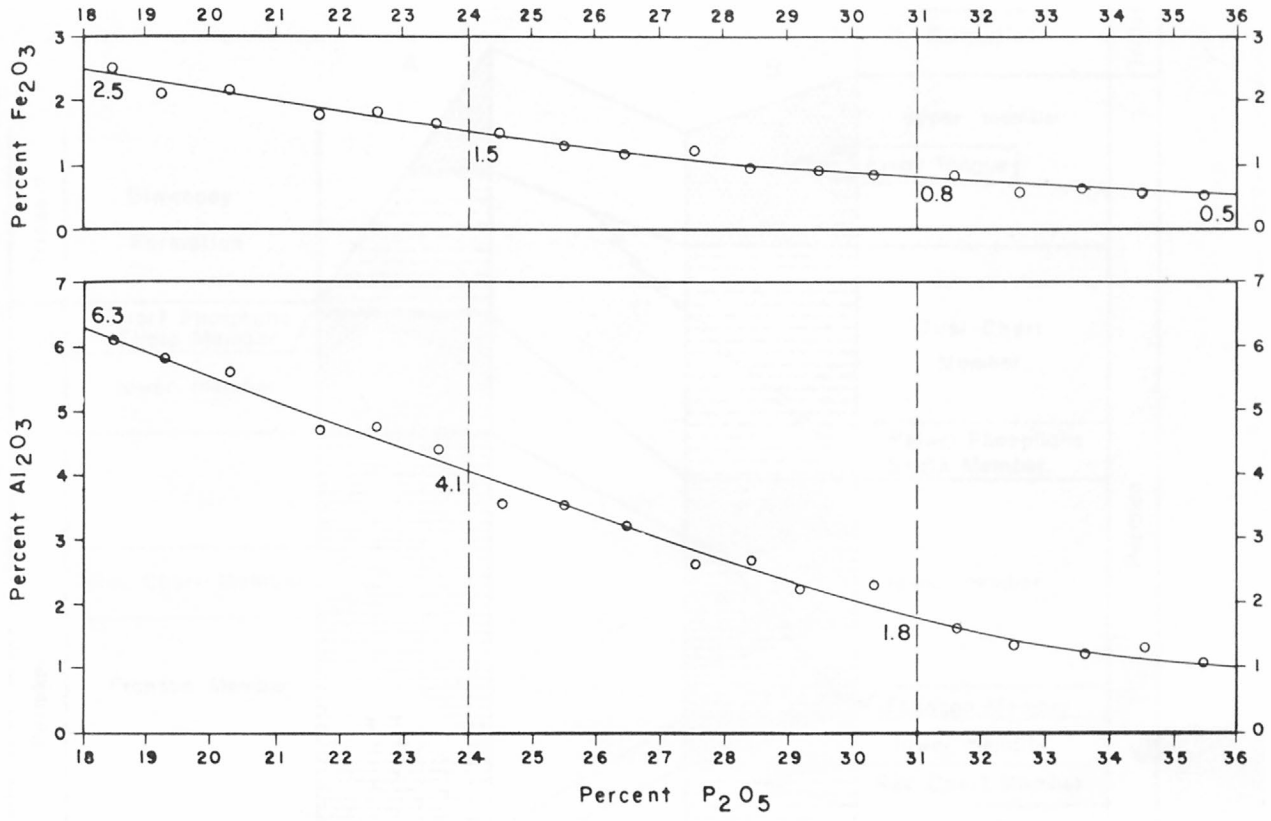

FIGURE 1.--Relation of alumina and iron-oxide content to phosphorus-pentoxide content in phosphate rock of the western phosphate field. The circles indicate the averages of analytical data from 24 localities in Montana, Idaho, Wyoming, and Utah.

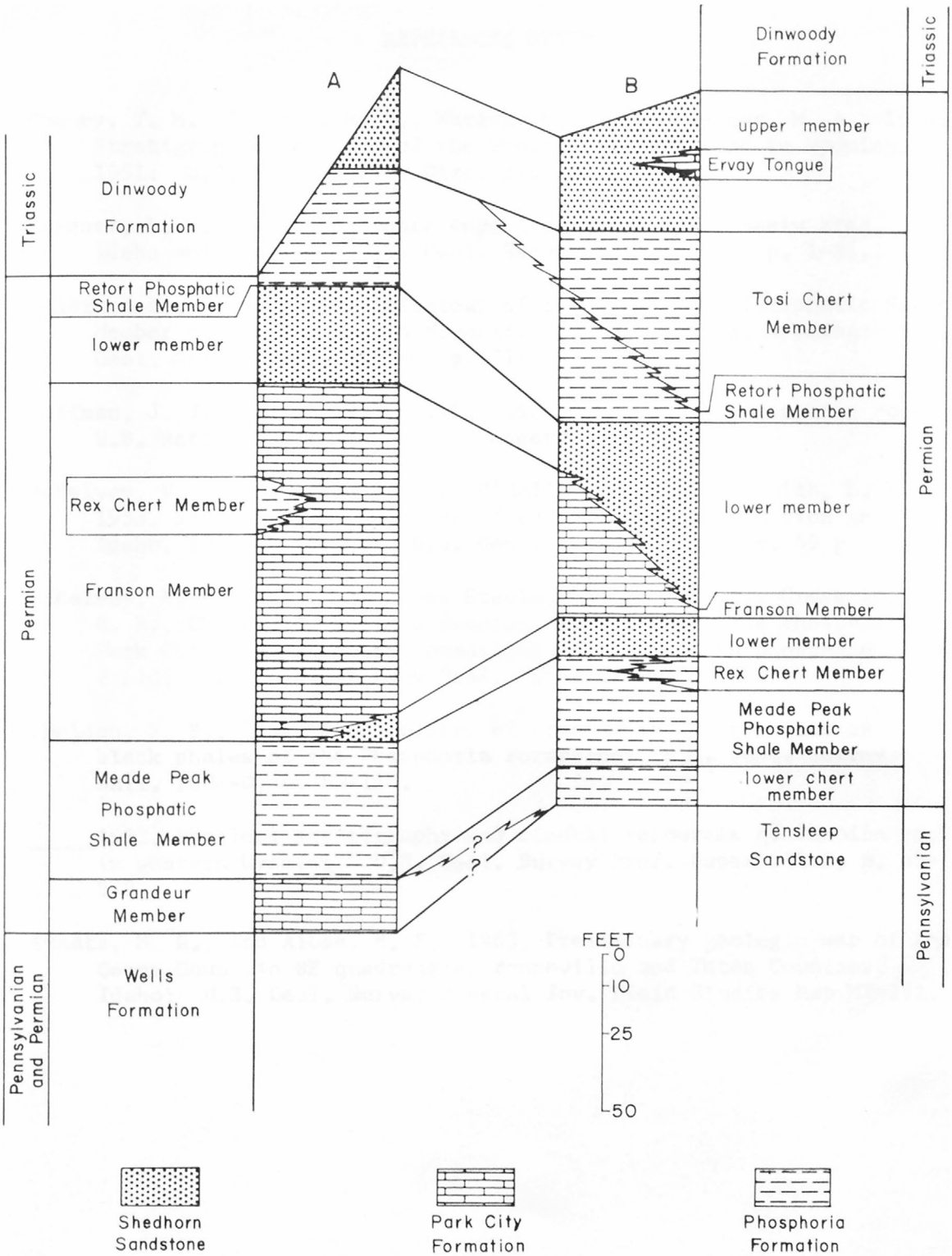

FIGURE 2.--Chart showing generalized stratigraphic relationships and nomenclature of Permian rocks in (A) the Snake River Range and (B) the Teton Range and the western part of the Gros Ventre Range.

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TALBOT CREEK, WYO., CP-1

SE¼NE¼ and NE¼SE¼ sec. 9, unsurveyed, T. 41 N., R. 118 W., Teton County, Wyo.; about one-third mile up Talbot Creek north of Wyoming State Highway 22. Trench B of Gardner (1944, p. 32), about 50 feet above Talbot Creek on the northwest side, was deepened by hand trenching. About 25 feet above trench B, an excavation was made in the lower chert member of the Phosphoria Formation and adjacent rocks. Along the southeast side of Talbot Creek, the Tosi Chert Member of the Phosphoria Formation and the overlying upper member of the Shedhorn Sandstone were exposed. Stratigraphic sections described by E. R. Cressman, W. C. Gere, and E. M. Schell; rocks sampled by H. L. Smith and W. C. Gere; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--basal part only					
			Top of trench.					
	D- 3	0.5	Siltstone, calcareous				0.5	----------
	D- 2	2.7	Siltstone, calcareous				3.2	----------
CP-1-15	D- 1	2.1	Sandstone and siltstone	4.63	----	73.39	5.3	9.72
			Upper member of Shedhorn Sandstone					
CP-1-14	P-50	3.5	Sandstone	6.36	----	76.96	3.5	31.98
CP-1-13	P-49	3.3	Sandstone	5.66	----	79.23	6.8	50.66
CP-1-12	P-48	3.1	Sandstone	6.34	----	76.34	9.9	70.31
CP-1-11	P-47	2.6	Sandstone	5.08	----	78.62	12.5	83.52
CP-1-10	P-46	2.1	Sandstone, silty, argillaceous	4.02	----	80.96	14.6	91.96
CP-1- 9	P-45	1.3	Sandstone, silty, argillaceous	3.55	----	76.57	15.9	96.57
CP-1- 8	P-44	2.8	Sandstone	7.06	----	74.21	18.7	*116.34
			Tosi Chert Member of Phosphoria Formation--upper part only					
	P-43	8.0	Chert				8.0	----------
			Base of trench.					
	P-42	140(?)	Concealed. Measurement from the Hungry Creek locality (Cheney and others, 1954, p. 9-10). This unit includes, from top to base, the lower part of the Tosi Chert Member and the Retort Phosphatic Shale Member of the Phosphoria Formation, tongues of the Shedhorn Sandstone, and a part of the Franson Member of the Park City Formation.					

Talbot Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation--basal bed only					
			Top of trench.					
	P-41	0.8	Chert				0.8	----------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation					
	P-40	0.2	Mudstone				0.2	----------
CP-1-7	P-39	2.5	Phosphorite	31.19	0.04	8.97	2.7	----------
	P-38	0.9	Siltstone				3.6	----------
	P-37	1.1	Siltstone, sandy, cherty				4.7	----------
	P-36	0.9	Siltstone				5.6	----------
	P-35	0.7	Mudstone, phosphatic				6.3	----------
	P-34	0.3	Mudstone, phosphatic				6.6	----------
	P-33	0.5	Chert				7.1	----------
	P-32	0.4	Chert				7.5	----------
	P-31	0.1	Chert				7.6	----------
	P-30	0.3	Dolomite, argillaceous				7.9	----------
	P-29	0.5	Phosphorite, argillaceous				8.4	----------
	P-28	0.3	Gouge, cherty				8.7	----------
	P-27	0.4	Chert				9.1	----------
	P-26	0.7	Siltstone, siliceous				9.8	----------
	P-25	0.3	Mudstone				10.1	----------
	P-24	1.7	Dolomite, siliceous, silty				11.8	----------
	P-23	0.4	Mudstone, silty				12.2	----------
	P-22	0.6	Dolomite, siliceous				12.8	----------
	P-21	1.3	Mudstone				14.1	----------
CP-1-6	P-20	1.6	Mudstone, carbonatic, silty	0.00	0.24	51.41	15.7	----------
	P-19	0.2	Phosphorite, argillaceous, calcareous				15.9	----------
	P-18	1.7	Chert and mudstone, phosphatic				17.6	----------
	P-17	0.9	Limestone, argillaceous				18.5	----------
CP-1-5	P-16	1.3	Phosphorite, calcareous	22.46	0.12	14.25	19.8	----------

Talbot Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued					
CP-1-4A	P-15	6.4	Chert and mudstone (CP-1-4A includes only the lower 2 feet of P-15)------	4.15	0.26	71.62	26.2	8.3
CP-1-4	P-14	0.8	Carbonate rock, argillaceous----------	8.97	0.20	15.11	27.0	15.48
CP-1-3A	P-13	0.5	Phosphorite, argillaceous------------	27.47	----	20.36	27.5	29.22
CP-1-3	P-12	0.9	Phosphorite, argillaceous------------	26.99	0.25	13.52	28.4	53.51
CP-1-2A	P-11	0.3	Phosphorite----------	30.45	0.08	8.16	28.7	62.65
CP-1-2	P-10	2.2	Phosphorite, silty, siliceous---------	21.81	0.04	28.19	30.9	110.63
CP-1-1A	P- 9	2.7	Mudstone, carbonatic, phosphatic------	9.78	0.11	43.64	33.6	137.04
CP-1-1	P- 8	1.4	Phosphorite and mudstone-------------	19.32	0.26	29.91	35.0	*164.09
			Lower chert member of Phosphoria Formation					
	P- 7	0.6	Dolomite, argillaceous---------- Base of trench. Top of trench.				0.6	---
CP-1-17	P- 6	0.5	Carbonate rock, phosphatic------------	15.31	----	13.05	1.1	---
CP-1-17	P- 5	0.5	Dolomite, phosphatic------------------	15.31	----	13.05	1.6	---
	P- 4	6.2	Chert----------				7.8	---
CP-1-16	P- 3	0.4	Phosphorite, carbonatic---------------	24.16	----	27.98	8.2	---
CP-1-16	P- 2	0.2	Mudstone, silty, dolomitic------------	24.16	----	27.98	8.4	---
CP-1-16	P- 1	0.2	Phosphorite, sandy, conglomeratic------	24.16	----	27.98	8.6	---
			Tensleep Sandstone--upper bed only					
	T- 1	3.0	Dolomite, cherty---------- Base of trench.				3.0	---

*Cumulative data incomplete. Computations start from zero after interruption.

NORTH FORK RAINEY CREEK, IDAHO, CP-2

NW¼SE¼ sec. 7, T. 2 N., R. 45 E., Bonneville County, Idaho. Partial stratigraphic section in natural exposures along the northwest side of North Fork Rainey Creek. A bulldozer trench exposed the thrust-fault contact between the upper part of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation and the underlying rocks of the Gannett Group of Early Cretaceous age. Stratigraphic section described by W. C. Gere and E. H. Pampeyan and sampled by H. L. Smith; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)
			Lower member of Shedhorn Sandstone--lower part only				
	P-24	14.7	Sandstone, cherty				14.7
			Franson Member of Park City Formation				
	P-23	5.8	Carbonate rock, sandy, cherty				5.8
	P-22	1.3	Carbonate rock, sandy				7.1
	P-21	1.0	Carbonate rock				8.1
	P-20	1.6	Carbonate rock, sandy				9.7
	P-19	1.1	Chert				10.8
	P-18	2.5	Carbonate rock, sandy				13.3
	P-17	1.0	Limestone				14.3
	P-16	1.0	Carbonate rock, sandy				15.3
	P-15	95±	Concealed				110.3
	P-14	5.2	Carbonate rock and chert				115.5
	P-13	7.7	Carbonate rock, sandy				123.2
	P-12	3.0	Carbonate rock				126.2
	P-11	5.0	Carbonate rock				131.2
	P-10	3.5	Chert and carbonate rock				134.7
	P- 9	5.9	Carbonate rock, sandy, cherty				140.6
	P- 8	2.9	Carbonate rock, cherty				143.5
	P- 7	1.3	Chert				144.8
	P- 6	1.5	Dolomite, cherty				146.3
CP-2-3	P- 5	4.8	Sandstone	5.78	0.01	69.68	151.1

North Fork Rainey Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation				
CP-2-2	P-4	1.0	Phosphorite, sandy----------	28.67	0.03	11.78	---------
CP-2-2	P-3	0.8	Phosphorite, cherty----------				152.9
CP-2-1	P-2	4.0	Phosphorite----------	31.44	0.02	4.46	156.9
	P-1	1.4	Mudstone, dolomitic, and phosphorite----------				158.3
			Distorted bedding. Fault between the uppermost part of the Meade Peak Phosphatic Shale Member and rocks of the Gannett Group (Lower Cretaceous)				

VICTOR, IDAHO, CP-3

NE¼SW¼NE¼ sec. 35, T. 3 N., R. 45 E., Teton County, Idaho. Hand-excavated trenches were cut in the Meade Peak and Retort Phosphatic Shale Members of the Phosphoria Formation near the ridgetop east of Pole Canyon, about 3 miles south of Victor, Idaho. Trenched rock sections described by E. H. Pampeyan, E. R. Cressman, and W. C. Gere and sampled by H. L. Smith; remainder of stratigraphic section described by W. C. Gere and E. M. Schell; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--lower unit					
			Siltstone, carbonatic.					
			Upper member of Shedhorn Sandstone					
CP-3-35	P-72	53.0	Sandstone (CP-3-35 is a grab sample from this unit)---------- Top of trench.	3.57	----	85.14	53.0	--------
	P-71	2.5	Sandstone----------				55.5	--------
	P-70	2.4	Sandstone----------				57.9	--------
CP-3-34	P-69	2.7	Sandstone----------	3.50	----	86.77	60.6	9.45
			Retort Phosphatic Shale Member of Phosphoria Formation					
CP-3-33	P-68	0.5	Mudstone----------	3.90	0.002	85.00	0.5	11.40
CP-3-32	P-67	0.5	Mudstone----------	4.01	0.002	84.72	1.0	20.62
CP-3-32	P-66	1.8	Sandstone----------				2.8	
CP-3-31	P-65	1.0	Phosphorite, argillaceous----------	26.58	0.01	22.50	3.8	*47.20
	P-64	5.6	Mudstone, dolomitic----------				9.4	--------
CP-3-30	P-63	4.9	Mudstone, phosphatic----------	13.63	0.01	58.53	14.3	66.79
CP-3-29	P-62	1.0	Phosphorite, argillaceous, sandy-----	18.87	0.01	42.99	15.3	85.66

Victor, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Lower member of Shedhorn Sandstone					
CP-3-28	P-61	3.0	Phosphorite, sandy----------	18.85	----	42.88	3.0	142.21
CP-3-27	P-60	2.3	Sandstone, phosphatic----------	14.86	----	52.71	5.3	176.39
CP-3-26	P-59	1.0	Sandstone, phosphatic----------	14.57	----	55.77	6.3	190.96
CP-3-25	P-58	4.2	Sandstone, phosphatic----------	16.37	----	50.58	10.5	259.71
CP-3-24	P-57	4.5	Sandstone, phosphatic----------	16.51	----	49.32	15.0	334.00
CP-3-23	P-56	4.1	Sandstone, phosphatic----------	13.79	----	56.05	19.1	390.54
			Franson Member of Park City Formation					
CP-3-22	P-55	0.8	Mudstone, phosphatic----------	12.54	----	49.05	0.8	400.57
CP-3-21	P-54	1.0	Phosphorite, argillaceous----------	15.91	----	38.57	1.8	416.48
			Base of trench.					
	P-53	14.0	Chert and carbonate rock----------				15.8	----------
	P-52	3.1	Carbonate rock, sandy----------				18.9	----------
	P-51	7.3	Dolomite, cherty----------				26.2	----------
	P-50	20.3	Carbonate rock----------				46.5	----------
	P-49	14.5	Carbonate rock, cherty in lower part----------				61.0	----------
	P-48	24.3	Siltstone and carbonate rock----------				85.3	----------
	P-47	22.3	Limestone, sandy----------				107.6	----------
			Top of trench.					
	P-46	3.9	Dolomite, cherty----------				111.5	----------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation					
			Fault(?).					
	P-45	1.5	Breccia, siltstone, phosphorite, and chert----------				1.5	----------
	P-44	0.5	Mudstone, phosphatic----------				2.0	----------
	P-43	1.2	Siltstone, dolomitic----------				3.2	----------
	P-42	0.5	Mudstone----------				3.7	----------
	P-41	0.2	Phosphorite, calcareous, argillaceous----------				3.9	----------
	P-40	0.3	Siltstone, dolomitic----------				4.2	----------

Victor, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued					
	P-39	0.3	Phosphorite, argillaceous				4.5	----------
	P-38	2.9	Siltstone, dolomitic				7.4	----------
	P-37	0.2	Phosphorite, argillaceous				7.6	----------
	P-36	1.0	Siltstone				8.6	----------
	P-35	0.4	Phosphorite, calcareous				9.0	----------
	P-34	1.1	Siltstone, carbonatic				10.1	----------
	P-33	0.2	Phosphorite				10.3	----------
	P-32	0.3	Siltstone				10.6	----------
CP-3-20	P-31	0.5	Phosphorite				11.1	
CP-3-20	P-30	1.4	Siltstone, phosphatic	25.17	0.07	21.12	12.5	78.03
CP-3-20	P-29	1.2	Phosphorite, argillaceous				13.7	
CP-3-19A	P-28	2.5	Phosphorite, argillaceous	24.27	0.08	22.75	16.2	138.70
CP-3-19	P-27	0.4	Phosphorite, argillaceous	22.66	0.21	22.76	16.6	*147.76
	P-26	4.1	Siltstone				20.7	---------
	P-25	2.0	Siltstone				22.7	---------
	P-24	4.0	Dolomite, argillaceous				26.7	---------
CP-3-18	P-23	5.2	Mudstone, silty	0.09	0.08	86.94	31.9	0.59
CP-3-18	P-22	1.4	Siltstone				33.3	
CP-3-17	P-21	1.3	Mudstone	4.58	0.40	70.12	34.6	6.56
CP-3-16	P-20	1.5	Mudstone, carbonatic, phosphatic	10.62	0.60	42.30	36.1	22.49
CP-3-15	P-19	1.1	Mudstone, carbonatic	8.23	0.25	50.84	37.2	31.54
CP-3-14	P-18	1.3	Mudstone, carbonatic, phosphatic	13.36	0.44	34.19	38.5	48.91
CP-3-13	P-17	0.8	Mudstone	8.24	0.64	49.32	39.3	55.50
CP-3-12	P-16	0.6	Mudstone, calcareous, phosphatic	9.17	0.50	40.19	39.9	65.59
CP-3-12	P-15	0.5	Mudstone, phosphatic, silty				40.4	
CP-3-11	P-14	1.3	Dolomite	9.11	0.21	17.71	41.7	77.43
CP-3-10	P-13	0.9	Mudstone, carbonatic	5.46	0.51	53.92	42.6	83.44
CP-3-10	P-12	0.2	Mudstone, carbonatic				42.8	
CP-3- 9	P-11	1.4	Phosphorite and mudstone	25.12	0.02	14.49	44.2	*118.61
	P-10	0.8	Dolomite, argillaceous				45.0	---------

Victor, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued					
CP-3-8	P-9	0.5	Phosphorite, carbonatic----------	17.02	0.06	3.68	45.5	20.42
CP-3-8	P-8	0.7	Dolomite----------				46.2	
CP-3-7	P-7	0.5	Phosphorite----------	35.12	0.06	3.90	46.7	37.98
[1]CP-3-6A	P-6	1.8	Dolomite, argillaceous----------	0.03	----	13.42	48.5	38.03
CP-3-6	P-5	0.8	Phosphorite----------	36.31	0.02	2.95	49.3	67.08
CP-3-5	P-4	0.9	Phosphorite, sandy----------	19.50	0.009	45.14	50.2	84.63
CP-3-4	P-3	1.0	Phosphorite, sandy----------	29.57	----	22.64	51.2	114.20
CP-3-3	P-2	0.7	Siltstone and sandstone----------	5.54	----	72.52	51.9	118.08
CP-3-2	P-1	0.6	Phosphorite and chert breccia------	26.49	----	22.04	52.5	133.97
			Grandeur Member of Park City Formation and Wells Formation, undifferentiated--upper part only					
	W-17	0.6	Chert, carbonatic----------				0.6	---
	W-16	0.3	Dolomite, cherty, sandy----------				0.9	---
	W-15	0.1	Chert, carbonatic----------				1.0	---
	W-14	1.9	Dolomite----------				2.9	---
	W-13	0.2	Chert, carbonatic----------				3.1	---
CP-3-1	W-12	0.5	Sandstone, dolomitic----------	3.63	----	43.75	3.6	---
	W-11	0.9	Breccia, carbonate rock in a sandstone matrix----------				4.5	---
	W-10	1.2	Limestone----------				5.7	---
	W- 9	4.0	Dolomite----------				9.7	---
			Base of trench.					
	W- 8	33.5	Concealed----------				43.2	---
	W- 7	3.4	Dolomite----------				46.6	---
	W- 6	23.2	Concealed, carbonatic sandstone float----------				69.8	---
	W- 5	4.4	Sandstone----------				74.2	---
	W- 4	18.0	Concealed, sandstone float----------				92.2	---
	W- 3	15.2	Sandstone----------				107.4	---
	W- 2	18.2	Concealed----------				125.6	---
	W- 1	21.9	Sandstone, carbonatic----------				147.5	---

*Cumulative data incomplete. Computations start from zero after interruption.

[1]Chip sample.

NORTH SIDE THOMPSON PEAK, IDAHO, CP-4

SW¼NE¼ sec. 22, unsurveyed, T. 2 N., R. 45 E., Bonneville County, Idaho. The trench locality is on top of the ridge and along the trail about 1½ miles north of Thompson Peak. A hand trench exposed the Retort Phosphatic Shale Member of the Phosphoria Formation and the upper part of the underlying lower member of the Shedhorn Sandstone. Exposed interval described and sampled by E. M. Schell and M. L. Schroeder; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--basal unit only					
			Top of trench.					
	D-1	3.5	Sandstone, calcareous----------				3.5	---------
			Retort Phosphatic Shale Member of Phosphoria Formation					
CP-4-5	P-7	1.0	Phosphorite----------	29.84	0.02	15.36	1.0	29.84
CP-4-4A	P-6	0.6	Mudstone----------	4.61	0.05	65.75	1.6	32.61
CP-4-4	P-5	1.4	Mudstone----------	8.17	0.04	54.21	3.0	44.05
CP-4-3	P-4	0.5	Phosphorite, argillaceous, sandy---	26.64	0.008	21.01	3.5	57.37
			Lower member of Shedhorn Sandstone--upper part only					
CP-4-2	P-3	1.1	Sandstone, phosphatic----------	13.96	----	58.13	1.1	72.73
CP-4-1	P-2	3.9	Sandstone----------	2.21	----	89.77	5.0	81.35
	P-1	1.4	Sandstone----------				6.4	---------
			Base of trench.					

MOOSE CREEK, IDAHO, CP-6

NE¼SE¼SE¼ sec. 20, T. 3 N., R. 46 E., Teton County, Idaho. Trenched exposures of base and top of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation described and sampled by W. C. Gere, E. H. Pampeyan, and H. L. Smith; Jacob staff measurements of the beds stratigraphically above the Meade Peak made by E. M. Schell; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation--lower part only				
			Concealed.				
	P-18	2.0	Carbonate rock, cherty			2.0	
			Lower member of Shedhorn Sandstone				
	P-17	17.0	Sandstone, carbonatic and cherty			17.0	
	P-16	3.0	Sandstone, cherty, calcareous			20.0	
	P-15	2.0	Sandstone, conglomeratic			22.0	
	P-14	4.5	Sandstone, calcareous			26.5	
	P-13	9.0	Concealed			35.5	
	P-12	1.0	Sandstone, calcareous			36.5	
			Rex Chert Member of Phosphoria Formation				
	P-11	7.0	Chert			7.0	
			Top of trench.				
	P-10	3.0	Sandstone, dolomitic			3.0	
	P-9	1.3	Limestone and dolomite			4.3	
			Meade Peak Phosphatic Shale Member of Phosphoria Formation				
CP-6-1	P-8	1.8	Phosphorite	35.47	5.45	1.8	
	P-7	3.2	Mudstone, dolomitic			5.0	
			Base of trench.				
	P-6		Concealed, stratigraphic thickness unknown				
			Top of trench.				
	P-5	2.0	Dolomite, silty			2.0	

Moose Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued				
			Fault, unknown displacement.				
CP-6A-2	P-4	1.3	Phosphorite----------	35.12	7.78	3.3	45.66
CP-6A-1A	P-3	0.5	Sandstone, phosphatic, silty----------	14.72	52.01	3.8	53.02
CP-6A-1	P-2	1.2	Phosphorite----------	28.18	14.99	5.0	86.84
			Base of trench.				
			Lower chert member of Phosphoria Formation--thickness not known				
	P-1		Chert.				

PINE CREEK, IDAHO, CP-8

SW¼NW¼ sec. 28 and C NW¼ and NW¼SE¼ sec. 29, T. 3 N., R. 44 E., Bonneville County, Idaho; composite of three partial stratigraphic sections. Only the upper part of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation and the overlying rocks are available for study at the Pine Creek localities because of the structural interference of the Absaroka and Poison Creek faults (Staatz and Albee, 1963). Rocks described by W. C. Gere, E. M. Schell, and H. L. Cullins; sampled by E. M. Schell and H. L. Smith; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)
			Dinwoody Formation--basal bed only				
			Siltstone, carbonatic.				
			Retort Phosphatic Shale Member of Phosphoria Formation				
CP-8-4	P-37	1.5	Phosphorite and mudstone----------	30.68	0.008	14.03	1.5
CP-8-3	P-36	4.7	Mudstone, phosphatic----------	9.98	0.01	57.07	6.2
CP-8-2	P-35	1.7	Mudstone----------	5.61	0.007	63.50	7.9
CP-8-1	P-34	1.1	Sandstone and phosphorite----------	16.36	0.006	52.92	9.0
			Lower member of Shedhorn Sandstone				
	P-33	30.0	Sandstone, cherty----------				30.0
	P-32	0.7	Phosphorite, sandy----------				30.7
			Franson Member of Park City Formation				
	P-31	9.0	Dolomite, cherty----------				9.0
	P-30	7.7	Chert and carbonate rock, cherty----------				16.7
	P-29	0.1	Siltstone, phosphatic----------				16.8
	P-28	26.0	Dolomite----------				42.8
	P-27	12.0	Siltstone, dolomitic, cherty----------				54.8
	P-26	8.0	Chert, silty and sandy----------				62.8
CP-8-B1	P-25	2.1	Phosphorite, sandy----------	19.21	-----	38.38	64.9
	P-24	6.1	Carbonate rock, sandy----------				71.0
	P-23	2.0	Carbonate rock, cherty----------				73.0
	P-22	0.6	Chert----------				73.6

Pine Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Acid insoluble	Cumulative thickness (feet)
			Franson Member of Park City Formation--Continued				
	P-21	3.4	Carbonate rock and chert				77.0
	P-20	0.7	Chert				77.7
	P-19	4.5	Carbonate rock, cherty				82.2
	P-18	0.5	Chert and carbonate rock				82.7
	P-17	1.3	Carbonate rock				84.0
	P-16	1.5	Chert, carbonatic				85.5
	P-15	3.1	Carbonate rock				88.6
	P-14	6.0	Chert, carbonatic				94.6
	P-13	7.0	Carbonate rock, argillaceous				101.6
	P-12	1.5	Chert, carbonatic				103.1
	P-11	10.0	Limestone, argillaceous				113.1
	P-10	2.0	Chert, carbonatic				115.1
	P- 9	8.0	Sandstone, calcareous, cherty				123.1
	P- 8	1.0	Limestone, argillaceous, sandy				124.1
	P- 7	7.0	Chert				131.1
	P- 6	1.7	Chert and carbonate rock				132.8
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--upper part only				
CP-8-8	P- 5	2.1	Phosphorite	31.14	----	6.72	2.1
CP-8-7	P- 5A	2.1	Phosphorite	32.89	----	3.75	4.2
CP-8-6	P- 4	0.5	Siltstone	5.70	----	70.98	4.7
CP-8-5	P- 3	0.6	Phosphorite	30.58	----	9.17	5.3
	P- 2	2.1	Siltstone and phosphorite				7.4
	P- 1	0.2	Mudstone				7.6

CACHE CREEK, WYO., CP-10

NW¼NE¼ sec. 1, T. 40 N., R. 116 W., Teton County, Wyo., on the northeast side of Cache Creek about 700 feet above the valley floor; composite section of four hand-excavated trenches and Jacob staff measurements of the intervening intervals. Described and sampled by W. C. Gere and E. M. Schell; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)
			Dinwoody Formation--lower bed only					
	D-1		Sandstone, silty, carbonatic.					
			Upper member of Shedhorn Sandstone					
	P-73	3.0	Sandstone----------					3.0
CP-10-8	P-72	2.5	Sandstone, cherty----------	5.33	----	-----	80.11	5.5
CP-10-7	P-71	2.5	Sandstone, cherty----------	4.87	----	-----	82.20	8.0
			Tosi Chert Member of Phosphoria Formation					
	P-70	4.0	Chert, dolomitic----------					4.0
	P-69	11.0	Chert----------					15.0
	P-68	4.0	Chert, argillaceous, carbonatic----------					19.0
			Retort Phosphatic Shale Member of Phosphoria Formation					
	P-67	29.6	Concealed---------- Top of trench.					29.6
	P-66	5.4	Dolomite----------					35.0
	P-65	2.5	Mudstone, dolomitic----------					37.5
	P-64	0.5	Mudstone, phosphatic, carbonaceous----------					38.0
CP-10-6	P-63	0.4	Phosphorite, cherty----------	26.75	----	-----	18.25	38.4
			Lower member of Shedhorn Sandstone					
CP-10-5	P-62	1.0	Sandstone, phosphatic, cherty----------	10.11	----	-----	53.85	1.0
	P-61	1.5	Sandstone, cherty----------					2.5
	P-60	5.0	Sandstone----------					7.5

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)
			Franson Member of Park City Formation					
	P-59	4.0	Dolomite, sandy Base of trench.					4.0
	P-59A	5.2	Dolomite					9.2
	P-58	3.7	Carbonate rock					12.9
	P-57	2.6	Concealed					15.5
	P-56	0.9	Carbonate rock, sandy					16.4
	P-55	0.9	Carbonate rock					17.3
	P-54	9.2	Carbonate rock, sandy					26.5
	P-53	4.6	Carbonate rock					31.1
	P-52	4.5	Carbonate rock, sandy					35.6
	P-51	2.0	Carbonate rock					37.6
	P-50	4.6	Carbonate rock, sandy					42.2
	P-49	2.8	Sandstone and chert					45.0
	P-48	1.7	Dolomite					46.7
	P-47	0.9	Sandstone, calcareous					47.6
	P-46	2.3	Concealed					49.9
	P-45	13.8	Carbonate rock, sandy					63.7
	P-44	3.8	Sandstone					67.5
	P-43	1.2	Dolomite, argillaceous					68.7
	P-42	0.3	Chert					69.0
	P-41	1.2	Sandstone					70.2
	P-40	1.8	Dolomite, argillaceous Top of trench.					72.0
	P-39	0.6	Carbonate rock, argillaceous					72.6
			Meade Peak Phosphatic Shale Member of Phosphoria Formation					
CP-10-1	P-38	0.8	Phosphorite, sandy, carbonatic	22.22	----	-----	30.11	0.8
	P-37	0.4	Dolomite, argillaceous					1.2
	P-36	0.1	Phosphorite, argillaceous					1.3
	P-35	2.6	Siltstone, carbonatic					3.9
	P-34	0.2	Phosphorite, carbonatic					4.1

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued					
	P-33	0.5	Dolomite					4.6
	P-32	0.3	Mudstone, phosphatic					4.9
	P-31	0.1	Phosphorite, cherty					5.0
	P-30	5.8	Chert					10.8
	P-29	0.5	Siltstone, argillaceous					11.3
	P-28	0.6	Chert					11.9
	P-27	0.3	Mudstone					12.2
	P-26	0.3	Chert, silty					12.5
	P-25	0.3	Phosphorite, argillaceous, carbonatic					12.8
	P-24	1.7	Chert, phosphatic					14.5
	P-23	2.2	Dolomite, silty					16.7
	P-22	1.6	Mudstone, siliceous					18.3
	P-21	0.7	Dolomite, siliceous					19.0
	P-20	0.6	Mudstone and phosphorite, cherty					19.6
	P-19	0.8	Dolomite, argillaceous					20.4
	P-18	0.8	Mudstone, siliceous					21.2
			Base of trench.					
			Top of trench.					
	P-17	0.1	Phosphorite, cherty					21.3
	P-16	1.0	Dolomite, argillaceous					22.3
	P-15	0.3	Mudstone, carbonatic, phosphatic					22.6
	P-14	0.8	Dolomite, phosphatic					23.4
	P-13	2.2	Dolomite, calcareous, silty					25.6
			Base of trench.					
			Top of trench.					
	P-12	2.9	Dolomite, silty					28.5
	P-11	1.0	Mudstone, phosphatic					29.5
	P-10	0.8	Siltstone, argillaceous, phosphatic					30.3
	P- 9	1.6	Dolomite, silty					31.9
	P- 8	0.3	Carbonate rock, argillaceous					32.2

Cache Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued					
CP-10-4	P-7	0.6	Phosphorite, argillaceous, calcareous----	15.77	0.38	0.26	27.65	32.8
CP-10-3	P-6	0.8	Phosphorite----------	28.39	----	----	8.28	33.6
CP-10-2	P-5	0.9	Phosphorite----------	30.07	----	----	1.36	34.5
			Lower chert member of Phosphoria Formation					
	P-4	1.3	Chert----------					1.3
	P-3	1.4	Limestone----------					2.7
	P-2	2.0	Chert----------					4.7
	P-1	0.5	Phosphorite, cherty, sandy----------					5.2
			Tensleep Sandstone--upper unit only					
		2.4	Dolomite, sandy, argillaceous----------					2.4
			Base of trench.					

EAST GROS VENTRE BUTTE, WYO., CP-11

SW¼NE¼ sec. 15, T. 41 N., R. 116 W., Teton County, Wyo., on the northeast side of East Gros Ventre Butte, about 250 feet above the valley floor. The Meade Peak Phosphatic Shale Member of the Phosphoria Formation was described and sampled in a hand-excavated trench; the remainder of the measurements were made by Jacob staff traverse. Described and sampled by E. M. Schell and W. C. Gere; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Upper part of the Permian sequence not exposed because of cover by volcanic rocks. Units P-66 to P-70 were measured about 200 feet southwest of the other rocks and consist of an isolated natural exposure that is assumed to be displaced by faulting. Tentative correlations suggest that this interval is a part of the upper member of the Shedhorn Sandstone.			
			Upper member of Shedhorn Sandstone--top not exposed			
	P-70	4.0	Chert and sandstone			4.0
	P-69	6.0	Sandstone, cherty			10.0
	P-68	1.0	Chert, sandy			11.0
	P-67	13.5	Sandstone, cherty			24.5
			Tosi Chert Member of Phosphoria Formation--base not exposed			
	P-66	5.5	Chert, sandy			5.5
			Concealed and faulted(?) interval of undetermined thickness.			
			Franson Member of Park City Formation--top not exposed			
	P-65	5.0	Dolomite, sandy			5.0
	P-64	10.0	Dolomite, sandy, cherty			15.0
	P-63	10.0	Dolomite, sandy, cherty			25.0
	P-62	4.0	Concealed			29.0
	P-61	5.0	Sandstone, cherty			34.0
	P-60	12.5	Carbonate rock, sandy			46.5
	P-59	3.5	Dolomite, sandy			50.0
	P-58	6.5	Sandstone, cherty			56.5
	P-57	2.0	Chert and carbonate rock			58.5
	P-56	2.0	Carbonate rock, sandy, cherty			60.5
	P-55	4.5	Sandstone			65.0

East Gros Ventre Butte, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Franson Member of Park City Formation--top not exposed--Continued			
			Top of trench.			
	P-54	2.7	Dolomite, sandy			67.7
	P-53	1.8	Sandstone			69.5
	P-52	0.4	Sandstone, cherty			69.9
	P-51	0.5	Dolomite, sandy, cherty			70.4
CP-11-7	P-50	0.8	Sandstone, phosphatic, cherty	15.82	48.21	71.2
			Meade Peak Phosphatic Shale Member of Phosphoria Formation			
CP-11-6	P-49	0.6	Chert, phosphatic, calcareous	15.27	46.10	0.6
	P-48	0.6	Dolomite			1.2
	P-47	0.3	Mudstone, phosphatic			1.5
	P-46	0.4	Carbonate rock, silty			1.9
	P-45	0.2	Sandstone, phosphatic			2.1
	P-44	1.5	Dolomite, silty			3.6
	P-43	0.1	Phosphorite, silty			3.7
	P-42	1.8	Siltstone			5.5
	P-41	0.3	Phosphorite, sandy, calcareous			5.8
	P-40	0.3	Mudstone and siltstone			6.1
	P-39	0.4	Dolomite, argillaceous			6.5
	P-38	4.2	Chert			10.7
	P-37	0.8	Chert, argillaceous			11.5
	P-36	0.1	Mudstone, cherty			11.6
	P-35	0.1	Chert			11.7
	P-34	0.1	Mudstone, siliceous, phosphatic			11.8
	P-33	0.3	Phosphorite, cherty			12.1
	P-32	1.4	Chert			13.5
	P-31	2.1	Dolomite, siliceous			15.6
	P-30	0.7	Dolomite, siliceous			16.3
	P-29	1.3	Dolomite, siliceous			17.6
	P-28	0.3	Dolomite, siliceous			17.9

East Gros Ventre Butte, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued			
	P-27	0.4	Mudstone, carbonatic, silty			18.3
	P-26	1.1	Dolomite, silty			19.4
	P-25	0.6	Dolomite, siliceous			20.0
	P-24	0.6	Dolomite, siliceous			20.6
	P-23	0.4	Mudstone, phosphatic, cherty			21.0
	P-22	0.3	Chert, carbonatic, phosphatic			21.3
	P-21	2.5	Mudstone, silty, phosphatic			23.8
	P-20	0.4	Carbonate rock, argillaceous			24.2
	P-19	1.0	Mudstone			25.2
	P-18	0.2	Mudstone, silty			25.4
	P-17	0.4	Mudstone, carbonatic			25.8
CP-11-12	P-16	0.2	Phosphorite, argillaceous	17.5	39.2	26.0
CP-11-11	P-15	0.3	Siltstone, carbonatic	0.0	49.5	26.3
	P-14	0.9	Dolomite, argillaceous			27.2
[1]CP-11-10	P-13	1.0	Carbonate rock	0.04	6.62	28.2
[1]CP-11- 9	P-12	0.3	Mudstone, carbonatic	0.00	65.69	28.5
CP-11- 5	P-11	1.1	Phosphorite	24.37	10.71	29.6
CP-11- 4	P-10	0.7	Phosphorite, calcareous	22.41	10.47	30.3
[1]CP-11- 8	P- 9	0.3	Dolomite	0.59	9.15	30.6
CP-11- 3	P- 8	1.4	Phosphorite	26.96	12.18	32.0
CP-11- 2	P- 7	0.6	Carbonate rock, argillaceous	7.13	31.61	32.6
CP-11-1A	P- 6	1.3	Phosphorite	28.59	2.39	33.9
			Lower chert member of Phosphoria Formation			
	P- 5	1.5	Carbonate rock, silty Base of trench.			1.5
	P- 4	6.0	Chert			7.5
	P- 3	1.0	Dolomite, cherty			8.5
	P- 2	7.7	Chert			16.2
	P- 1	0.3	Phosphorite, conglomeratic			16.5
			Tensleep Sandstone--upper unit only			
	T- 7	3.0	Dolomite, sandy			3.0

[1]Chip sample.

GAME CREEK, WYO., CP-12

SW¼ sec. 24, unsurveyed, T. 40 N., R. 116 W., Teton County, Wyo. The upper and lower parts of the Meade Peak and the Retort Phosphatic Shale Members of the Phosphoria Formation were exposed in hand-excavated trenches; the remainder of the measurements were made along a Jacob staff traverse. Described and sampled by E. M. Schell and W. C. Gere; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--basal unit only						
	D- 1	1.5	Sandstone, silty, and siltstone----------					1.5	----------
			Upper member of Shedhorn Sandstone						
	P-53	15.0	Sandstone----------					15.0	----------
			Top of trench.						
CP-12-15	P-52	3.0	Sandstone, phosphatic----------	9.33	----	-----	65.82	18.0	27.99
			Retort Phosphatic Shale Member of Phosphoria Formation						
CP-12-14	P-51	2.0	Sandstone, phosphatic----------	17.05	----	-----	45.26	2.0	62.09
CP-12-13	P-50	2.6	Phosphorite, sandy, argillaceous	19.50	----	-----	39.75	4.6	112.79
	P-49	2.5	Mudstone, calcareous----------					7.1	----------
			Base of trench.						
	P-48	21.0	Concealed, mudstone float----------					28.1	----------
			Top of trench.						
CP-12-12	P-47	1.0	Phosphorite, sandy----------	24.22	----	-----	28.26	29.1	----------
			Lower member of Shedhorn Sandstone						
	P-46	4.0	Sandstone, cherty, calcareous----------					4.0	----------
			Base of trench.						
	P-45	5.0	Sandstone----------					9.0	----------
	P-44	2.5	Sandstone, calcareous, argillaceous----------					11.5	----------
	P-43	3.5	Carbonate rock and chert, sandy----------					15.0	----------
	P-42	3.0	Sandstone, calcareous----------					18.0	----------

Game Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation						
	P-41	3.5	Carbonate rock					3.5	
	P-40	2.5	Carbonate rock					6.0	
	P-39	2.0	Chert and carbonate rock					8.0	
	P-38	22.0	Carbonate rock, sandy, cherty					30.0	
	P-37	14.0	Carbonate rock, cherty					44.0	
	P-36	6.0	Concealed					50.0	
	P-35	6.0	Carbonate rock, cherty					56.0	
	P-34	9.0	Dolomite, cherty					65.0	
	P-33	2.4	Concealed					67.4	
	P-32	1.0	Carbonate rock					68.4	
	P-31	0.7	Sandstone, phosphatic, calcareous					69.1	
	P-30	0.3	Sandstone, phosphatic, cherty					69.4	
	P-29	1.2	Carbonate rock					70.6	
	P-28	0.4	Phosphorite, sandy, cherty					71.0	
	P-27	5.0	Carbonate rock, sandy					76.0	
	P-26	8.0	Dolomite					84.0	
	P-25	6.0	Dolomite, sandy, cherty					90.0	
			Lower member of Shedhorn Sandstone						
	P-24	15.0	Sandstone, cherty, calcareous					15.0	
			Franson Member of Park City Formation						
			Top of trench.						
	P-23	0.5	Dolomite, siliceous					0.5	
	P-22	0.6	Chert, dolomitic					1.1	
	P-21	0.8	Dolomite, siliceous					1.9	
	P-20	0.2	Dolomite and mudstone					2.1	
	P-19	0.7	Chert, calcareous					2.8	
	P-18	0.6	Dolomite					3.4	

Game Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation						
CP-12-11	P-17	1.6	Phosphorite, calcareous, cherty-					1.6	
CP-12-11	P-16	0.1	Mudstone, phosphatic, silty-----	14.35	----	-----	46.90	1.7	*33.00
CP-12-11	P-15	0.6	Mudstone, phosphatic----------					2.3	
[1]CP-12-17	P-14	1.7	Mudstone, silty----------	0.00	----	-----	86.18	4.0	----------
[1]CP-12-16	P-13	0.4	Mudstone, silty----------	0.00	----	-----	85.85	4.4	----------
CP-12-10	P-12	0.8	Mudstone, silty----------					5.2	
CP-12-10	P-11	0.6	Phosphorite, argillaceous-------	17.07	0.05	0.09	37.67	5.8	*34.14
CP-12-10	P-10	0.6	Mudstone, silty----------					6.4	
			Base of trench.						
	P- 9	31.8	Concealed----------					38.2	----------
			Top of trench.						
CP-12- 8	P- 8	1.2	Carbonate rock, argillaceous----	0.09	0.39	0.07	21.06	39.4	0.11
CP-12- 7	P- 7	0.8	Mudstone, carbonatic----------	5.01	----	-----	50.91	40.2	4.12
CP-12- 6	P- 6	2.7	Mudstone, calcareous, and phosphorite----------	8.65	----	-----	21.35	42.9	27.47
CP-12- 5	P- 5	1.5	Phosphorite----------	25.75	----	-----	10.19	44.4	66.09
CP-12- 4	P- 4	0.4	Carbonate rock----------	6.11	----	-----	8.95	44.8	68.53
CP-12- 3	P- 3	1.4	Phosphorite----------	30.10	----	-----	2.27	46.2	110.67
CP-12- 2	P- 2	0.7	Siltstone----------	2.53	----	-----	68.03	46.9	112.44
CP-12- 1	P- 1	1.0	Phosphorite----------	31.75	----	-----	2.15	47.9	144.19
			Base of trench.						
			Grandeur Member of Park City Formation and Wells Formation, undifferentiated--upper part only						
	W-20	6.0	Carbonate rock, sandy----------						

*Cumulative data incomplete. Computations start from zero after interruption.

[1]Chip sample.

WEST GROS VENTRE BUTTE, WYO., CP-13

NW¼NE¼ sec. 17, T. 41 N., R. 116 W., Teton County, Wyo., on the northeast side of West Gros Ventre Butte, about 150 feet above the valley floor. The Meade Peak Phosphatic Shale Member and part of the Retort Phosphatic Shale Member of the Phosphoria Formation, exposed in hand trenches, described by E. M. Schell and W. C. Gere; the remainder of the rocks described by E. M. Schell along a Jacob staff traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Dinwoody Formation--lower unit only			
			Top of trench.			
	D- 1	4.0	Siltstone, calcareous----------			4.0
			Upper member of Shedhorn Sandstone			
	P-55	10.0	Sandstone, calcareous----------			10.0
			Base of trench.			
			Tosi Chert Member of Phosphoria Formation			
	P-54	14.0	Chert, carbonatic----------			14.0
			Top of trench.			
	P-53	10.0	Chert----------			24.0
			Retort Phosphatic Shale Member of Phosphoria Formation			
	P-52	2.8	Chert and mudstone----------			2.8
	P-51	2.0	Rubble (fault?)----------			4.8
	P-50	34.0(?)	Concealed----------			38.8
			The trenched interval is abnormally thin. Jacob staff measurement was made nearby where the complete stratigraphic section appears to be present although poorly exposed. Thus, the 34.0(?) feet is the difference in thickness of the two measurements.			
CP-13-5	P-49	1.2	Phosphorite, cherty----------	21.81	47.89	40.0
			Lower member of Shedhorn Sandstone			
CP-13-4	P-48	1.5	Sandstone, phosphatic, carbonatic----------	12.71	35.70	1.5
			Base of trench.			
	P-47	3.5	Sandstone, carbonatic----------			5.0

West Gros Ventre Butte, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Franson Member of Park City Formation			
	P-46	4.0	Carbonate rock			4.0
	P-45	4.5	Carbonate rock			8.5
	P-44	2.5	Carbonate rock, argillaceous			11.0
	P-43	16.0	Carbonate rock, argillaceous, cherty			27.0
	P-42	8.0	Dolomite, sandy, cherty			35.0
	P-41	5.0	Dolomite			40.0
	P-40	14.0	Dolomite, sandy, cherty			54.0
	P-39	2.0	Carbonate rock, cherty			56.0
	P-38	5.0	Sandstone, carbonatic			61.0
	P-37	1.5	Sandstone, carbonatic, cherty			62.5
	P-36	1.5	Dolomite, sandy			64.0
	P-35	1.5	Sandstone, calcareous, phosphatic			65.5
	P-34	1.0	Chert, carbonatic			66.5
	P-33	0.5	Dolomite			67.0
			Meade Peak Phosphatic Shale Member of Phosphoria Formation			
			Top of trench.			
CP-13-6	P-32	1.7	Phosphorite, sandy	26.51	17.46	1.7
	P-31	3.8	Siltstone			5.5
	P-30	0.7	Phosphorite, sandy			6.2
	P-29	0.3	Sandstone, calcareous, silty			6.5
	P-28	0.6	Mudstone, phosphatic, carbonatic			7.1
	P-27	0.5	Dolomite			7.6
	P-26	0.2	Mudstone, carbonatic			7.8
	P-25	2.5	Chert			10.3
	P-24	0.2	Phosphorite			10.5
	P-23	1.2	Chert			11.7
	P-22	1.8	Carbonate rock, siliceous			13.5
	P-21	1.3	Carbonate rock, siliceous			14.8
	P-20	0.6	Chert			15.4
	P-19	1.0	Dolomite, siliceous			16.4

West Gros Ventre Butte, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued			
	P-18	0.4	Dolomite, siliceous			16.8
	P-17	1.7	Chert, dolomitic			18.5
	P-16	0.6	Mudstone, phosphorite, and chert			19.1
	P-15	0.7	Dolomite, argillaceous			19.8
	P-14	0.2	Mudstone, dolomitic, silty			20.0
	P-13	1.0	Dolomite, siliceous			21.0
	P-12	1.0	Mudstone, silty, carbonatic			22.0
	P-11	0.8	Dolomite, argillaceous			22.8
	P-10	0.8	Mudstone			23.6
	P- 9	2.0	Dolomite			25.6
[1]CP-13-7	P- 8	0.6	Siltstone, phosphatic	0.03	85.13	26.2
CP-13-3	P- 7	2.7	Phosphorite, argillaceous	24.07	18.02	28.9
CP-13-2	P- 6	1.0	Mudstone, phosphatic, carbonatic	10.93	33.99	29.9
CP-13-1	P- 5	1.2	Phosphorite	35.16	1.10	31.1
			Lower chert member of Phosphoria Formation			
	P- 4	1.5	Carbonate rock, cherty, sandy Base of trench.			1.5
	P- 3	12.5	Chert, carbonatic			14.0
	P- 2	0.1	Phosphorite			14.1
	P- 1	0.1	Carbonate rock, phosphatic			14.2
			Tensleep Sandstone--upper unit only			
	T- 6	18.8	Carbonate rock, sandy			18.8

[1]Chip sample.

SNOW KING MOUNTAIN, WYO., CP-14

NE¼NE¼ sec. 9, unsurveyed, T. 40 N., R. 116 W., Teton County, Wyo.; bulldozer trench excavated north of the divide between Leeks Canyon and Wilson Creek. Excavations to a depth of 15 feet were made in the Meade Peak and Retort Phosphatic Shale Members of the Phosphoria Formation, and most of the intervening rocks were exposed in an excavation about 7 feet deep. Described and sampled by E. M. Schell and W. C. Gere; chemical analyses by K. P. Moore. Semiquantitative spectrographic analyses by Geologic Division Laboratory, Denver, Colo.; results presented in table 1.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative
			Dinwoody Formation--lower unit only						
	D- 1	8.0	Siltstone, carbonatic					8.0	
			Upper member of Shedhorn Sandstone						
	P-70	13.0	Sandstone					13.0	
	P-69	2.8	Sandstone, cherty					15.8	
	P-68	4.3	Sandstone, chert, and siltstone rubble					20.1	
			Retort Phosphatic Shale Member of Phosphoria Formation						
	P-67	2.0	Siltstone, argillaceous					2.0	
	P-66	2.0	Carbonate rock, silty					4.0	
	P-65	2.5	Siltstone, carbonatic, and carbonate rock, silty					6.5	
	P-64	3.0	Siltstone, carbonatic, and carbonate rock, silty					9.5	
	P-63	2.2	Carbonate rock, silty, argillaceous					11.7	
	P-62	2.3	Carbonate rock, silty, argillaceous					14.0	
	P-61	1.6	Carbonate rock, argillaceous					15.6	
	P-60	0.8	Mudstone, silty, carbonatic					16.4	
	P-59	3.0	Mudstone, silty					19.4	
	P-58	3.6	Mudstone, silty					23.0	
CP-14-33	P-57	0.6	Mudstone	2.40	----	-----	75.49	23.6	1.44
CP-14-32	P-56	1.1	Phosphorite, argillaceous	27.37	----	-----	19.93	24.7	31.55
CP-14-31	P-55	1.9	Mudstone, silty	3.76	----	-----	71.43	26.6	38.69

Snow King Mountain, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Retort Phosphatic Shale Member of Phosphoria Formation--Continued						
CP-14-30	P-54	2.0	Mudstone	3.57	0.04	0.11	65.23	28.6	45.83
CP-14-29	P-53	2.0	Mudstone, carbonatic	5.40	0.06	0.18	54.41	30.6	56.63
CP-14-28	P-52	0.5	Mudstone, phosphatic	9.02	0.07	0.24	48.53	31.1	61.14
CP-14-27	P-51	0.7	Phosphorite, argillaceous	25.09	----	----	22.21	31.8	78.70
			Lower member of Shedhorn Sandstone						
CP-14-26	P-50	0.8	Sandstone, phosphatic	9.19	----	----	69.41	0.8	*86.05
	P-49	7.5	Sandstone, cherty					8.3	----------
			Franson Member of Park City Formation						
	P-48	13.5	Concealed, carbonate rock and chert float					13.5	----------
	P-47	5.5	Carbonate rock, argillaceous					19.0	----------
	P-46	8.0	Concealed					27.0	----------
	P-45	2.0	Carbonate rock					29.0	----------
	P-44	21.4	Carbonate rock, sandy, and chert					50.4	----------
	P-43	0.7	Chert					51.1	----------
	P-42	13.0	Carbonate rock, sandy					64.1	----------
	P-41	5.0	Carbonate rock, argillaceous					69.1	----------
	P-40	2.2	Carbonate rock, sandy					71.3	----------
	P-39	1.0	Carbonate rock, cherty					72.3	----------
	P-38	2.1	Carbonate rock					74.4	----------
	P-37	13.4	Dolomite, cherty, sandy					87.8	----------
	P-36	0.3	Chert, calcareous, sandy					88.1	----------
	P-35	2.9	Carbonate rock, cherty					91.0	----------
	P-34	6.0	Mudstone, silty, carbonatic					97.0	----------
	P-33	3.5	Carbonate rock, cherty, sandy					100.5	----------
	P-32	0.5	Chert					101.0	----------
	P-31	4.2	Carbonate rock, sandy					105.2	----------
	P-30	1.5	Sandstone, calcareous					106.7	----------

Snow King Mountain, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Rex Chert Member of Phosphoria Formation						
	P-29	5.0	Chert, calcareous----------					5.0	----------
	P-28	1.5	Carbonate rock, sandy----------					6.5	----------
	P-27	2.6	Chert, carbonatic----------					9.1	----------
	P-26	2.5	Carbonate rock, sandy----------					11.6	----------
	P-25	5.8	Chert----------					17.4	----------
	P-24	0.8	Chert and mudstone----------					18.2	----------
	P-23	2.0	Chert----------					20.2	----------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation						
CP-14-25	P-22	1.4	Phosphorite----------	30.98	----	-----	11.28	1.4	43.37
CP-14-24	P-21	1.5	Siltstone----------	0.09	----	-----	81.27	2.9	43.50
CP-14-23	P-20	0.8	Phosphorite and mudstone-------	17.78	----	-----	33.91	3.7	*57.72
	P-19	3.5	Siltstone, carbonatic----------					7.2	----------
	P-18	2.0	Siltstone, argillaceous----------					9.2	----------
	P-17	0.6	Mudstone and phosphorite----------					9.8	----------
	P-16	2.1	Siltstone, argillaceous----------					11.9	----------
CP-14-18	P-15B	2.2	Phosphorite, argillaceous------	23.54	0.07	0.23	18.61	14.1	51.79
CP-14-17	P-15A	2.2	Phosphorite, argillaceous------	23.60	0.06	0.18	17.99	16.3	103.71
CP-14-16	P-14	1.7	Mudstone----------	7.71	----	----	62.92	18.0	116.82
CP-14-15	P-13C	2.4	Mudstone----------	0.15	----	----	85.38	20.4	117.18
CP-14-14	P-13B	2.0	Mudstone----------	0.52	----	----	80.70	22.4	118.22
CP-14-13	P-13A	2.0	Mudstone----------	0.11	----	----	81.95	24.4	118.44
CP-14-12	P-12	2.9	Mudstone, silty----------	0.06	----	----	81.65	27.3	118.61
CP-14-11	P-11	1.4	Siltstone, carbonatic----------	0.05	----	----	70.76	28.7	118.68
CP-14-10	P-10	2.7	Mudstone, silty----------	1.94	0.32	0.11	73.64	31.4	123.92
CP-14- 9	P-9C	2.0	Mudstone and phosphorite-------	9.40	0.35	0.28	41.69	33.4	142.72
CP-14- 8	P-9B	1.9	Phosphorite and mudstone-------	16.54	0.18	0.45	18.44	35.3	174.15
CP-14- 7	P-9A	1.9	Phosphorite and mudstone-------	19.18	0.28	0.46	22.90	37.2	210.59
CP-14- 6	P-8	1.7	Carbonate rock, phosphatic-----	15.07	0.17	0.28	13.39	38.9	236.21
CP-14- 5	P-7	2.4	Phosphorite and carbonate rock-	28.56	----	----	5.40	41.3	304.75

Snow King Mountain, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued									
CP-14-4	P-6	0.9	Dolomite----------	2.09	----	----	6.78	42.2	306.63
CP-14-3	P-5	0.5	Phosphorite, calcareous--------}	25.24	----	----	2.33	42.9	319.25
CP-14-3	P-4	0.2	Carbonate rock----------}						324.30
CP-14-2	P-3	1.3	Phosphorite and carbonate rock, phosphatic----------	27.91	----	----	3.22	44.2	360.58
CP-14-1	P-2	0.1	Carbonate rock, phosphatic-----}	28.15	----	----	2.87	44.3	363.39
CP-14-1	P-1	1.5	Phosphorite----------}					45.8	405.61
Grandeur Member of Park City Formation and Wells Formation undifferentiated--upper part only									
	T-3	1.3	Carbonate rock, sandy----------					1.3	--------
	T-2	2.7	Sandstone and carbonate rock----------					4.0	--------
	T-1	4.0	Carbonate rock, cherty----------					8.0	--------
			Fault.						

*Cumulative data incomplete. Computations start from zero after interruption.

TETON PASS MOUNTAINS, WYO., CP-15

E½ sec. 12, unsurveyed, T. 41 N., R. 118 W., Teton County, Wyo., about 3 miles north of Teton Pass. The Meade Peak and Retort Phosphatic Shale Members and the Tosi Chert Member of the Phosphoria Formation, the Ervay Tongue of the Park City Formation, the Shedhorn Sandstone, and the basal part of the Dinwoody Formation were exposed, sampled, and described in two hand-excavated trenches by E. M. Schell and W. C. Gere; the remaining intervals were described by E. M. Schell along a Jacob staff traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--basal units only				
			Top of trench.				
	D-4	2.4	Siltstone, calcareous			2.4	--------
	D-3	2.0	Siltstone, calcareous			4.4	--------
	D-2	1.8	Siltstone, calcareous			6.2	--------
	D-1	1.1	Siltstone, sandy, calcareous			7.3	--------
			Upper member of Shedhorn Sandstone				
	P-68	3.5	Sandstone, cherty, calcareous			3.5	--------
	P-67	1.0	Sandstone, cherty, calcareous			4.5	--------
	P-66	1.25	Sandstone, calcareous			5.75	--------
			Ervay Tongue of Park City Formation				
	P-65	7.7	Limestone, sandy			7.7	--------
	P-64	2.0	Limestone			9.7	--------
	P-63	1.0	Carbonate rock, cherty, sandy			10.7	--------
			Tosi Chert Member of Phosphoria Formation				
	P-62	5.7	Chert			5.7	--------
	P-61	4.8	Chert and mudstone			10.5	--------

Teton Pass Mountains, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Retort Phosphatic Shale Member of Phosphoria Formation				
	P-60	2.1	Mudstone, siliceous			2.1	---
	P-59	2.7	Mudstone, silty, phosphatic			4.8	---
	P-58	8.3	Carbonate rock, argillaceous			13.1	---
	P-57	3.9	Mudstone, silty			17.0	---
	P-56	2.7	Carbonate rock, silty			19.7	---
	P-55	2.5	Dolomite, siliceous			22.2	---
	P-54	3.7	Mudstone, silty, phosphatic			25.9	---
	P-53	3.9	Carbonate rock and siltstone, argillaceous			29.8	---
	P-52	0.4	Phosphorite, cherty, sandy			30.2	---
	P-51	3.0	Mudstone, silty			33.2	---
CP-15-12	P-50	1.2	Phosphorite, calcareous	35.90	10.13	34.4	---
	P-49	3.1	Mudstone, silty			37.5	---
[1]CP-15-15	P-48	0.5	Phosphorite, cherty, argillaceous Base of trench.	23.77	24.93	38.0	---
			Lower member of Shedhorn Sandstone				
[1]CP-15-14	P-47	0.95	Sandstone, phosphatic	10.31	66.06	0.95	---
	P-46	9.0	Sandstone			9.95	---
			Franson Member of Park City Formation				
	P-45	5.0	Limestone, sandy			5.0	---
	P-44	10.0	Limestone			15.0	---
	P-43	5.0	Limestone, sandy			20.0	---
	P-42	2.0	Concealed, probably limestone			22.0	---
	P-41	3.0	Limestone, sandy			25.0	---
	P-40	2.5	Chert			27.5	---
	P-39	7.5	Limestone, cherty			35.0	---
	P-38	8.0	Limestone, cherty			43.0	---
	P-37	1.5	Limestone, sandy			44.5	---
	P-36	12.5	Limestone, sandy			57.0	---

Teton Pass Mountains, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Lower member of Shedhorn Sandstone				
	P-35	9.0	Sandstone, calcareous			9.0	---
	P-34	9.7	Sandstone			18.7	---
	P-33	0.9	Sandstone			19.6	---
	P-32	0.9	Limestone, sandy			20.5	---
	P-31	0.5	Sandstone			21.0	---
			Top of trench.				
	P-30	1.75	Carbonate rock, sandy			22.75	---
			Meade Peak Phosphatic Shale Member of Phosphoria Formation				
CP-15-11	P-29	0.76	Phosphorite, carbonate rock, and chert--	22.16	28.20	0.76	16.84
CP-15-10	P-28	1.24	Chert, mudstone, and phosphorite	9.90	64.77	2.0	29.12
CP-15-9	P-27	2.0	Phosphorite, calcareous	30.39	7.13	4.0	89.90
CP-15-8	P-26	1.75	Phosphorite and sandstone, phosphatic---	32.15	4.25	5.75	146.16
CP-15-7	P-25	3.0	Phosphorite	32.86	3.57	8.75	244.74
CP-15-6	P-24	2.6	Phosphorite and sandstone, phosphatic---	31.22	8.09	11.35	*325.91
			Units P-24 to P-27 consist of a pod which thins to about 1.5 feet thick within half a mile along strike.				
	P-23	1.6	Siltstone, sandy			12.95	---
	P-22	1.95	Mudstone, siltstone, and phosphorite			14.9	---
	P-21	1.75	Chert, silty			16.65	---
	P-20	0.3	Phosphorite, argillaceous, calcareous			16.95	---
	P-19	0.7	Siltstone and chert			17.65	---
	P-18	0.15	Phosphorite, sandy			17.8	---
	P-17	3.2	Siltstone and dolomite, siliceous			21.0	---
	P-16	0.7	Siltstone, siliceous			21.7	---
	P-15	1.8	Mudstone, silty			23.5	---
	P-14	0.15	Mudstone, silty, siliceous			23.65	---
	P-13	3.3	Mudstone			26.95	---

Teton Pass Mountains, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued				
[1]CP-15-13	P-12	0.8	Mudstone	3.48	81.46	27.75	2.78
CP-15-5	P-11	0.4	Phosphorite	32.94	6.01	28.15	15.96
CP-15-4	P-10	0.5	Limestone, argillaceous	6.76	37.98	28.65	19.34
CP-15-4	P-9	0.2	Chert and phosphorite			28.85	20.69
CP-15-3	P-8	1.2	Phosphorite	32.95	4.14	30.05	*60.23
	P-7	0.8	Chert			30.85	----------
	P-6	0.7	Carbonate rock, argillaceous			31.55	----------
	P-5	0.2	Chert			31.75	----------
CP-15-2	P-4	1.3	Mudstone, silty, phosphatic	9.59	56.74	33.05	12.47
CP-15-1	P-3	0.7	Phosphorite	31.62	14.70	33.75	*34.60
			Base of trench.				
			Lower chert member of Phosphoria Formation				
	P-2	8.5	Chert, carbonatic			8.5	----------
	P-1	0.5	Phosphorite			9.0	----------
			Tensleep Sandstone--upper unit only				
	T-20	4.0	Dolomite, conglomeratic				

[1]Chip sample.
*Cumulative data incomplete. Computations start from zero after interruption.

PINEY PEAK, IDAHO, CP-16

NW¼SW¼ sec. 35, T. 4 N., R. 43 E., Teton County, Idaho, along the south side of the crest of Piney Peak. The Meade Peak and Retort Phosphatic Shale Members of the Phosphoria Formation were described and sampled by E. M. Schell and H. F. Albee in hand-excavated trenches; the remaining interval was described by E. M. Schell along a Jacob staff traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--basal unit only						
	D-1		Siltstone, calcareous.						
			Retort Phosphatic Shale Member of Phosphoria Formation						
			Top of trench.						
	P-52	0.6	Phosphorite					0.6	----------
	P-51	1.0	Mudstone, silty					1.6	----------
	P-50	0.3	Mudstone, silty					1.9	----------
	P-49	2.8	Mudstone, silty, dolomitic					4.7	----------
	P-48	0.5	Mudstone					5.2	----------
CP-16-14	P-47	1.3	Phosphorite	28.55	----	-----	14.07	6.5	37.11
CP-16-13	P-46	2.0	Mudstone, silty	3.04	0.08	0.15	65.08	8.5	43.19
CP-16-12	P-45	0.7	Phosphorite, sandy	27.84	----	-----	21.38	9.2	62.68
			Lower member of Shedhorn Sandstone						
CP-16-11	P-44	0.4	Sandstone	9.23	----	-----	73.10	0.4	*66.37
			Base of trench.						
	P-43	21.6	Sandstone					22.0	----------
			Franson Member of Park City Formation						
	P-42	31.0	Concealed					31.0	----------
	P-41	20.0	Dolomite, sandy					51.0	----------
	P-40	11.0	Dolomite, very cherty					62.0	----------
	P-39	5.7	Siltstone					67.7	----------
	P-38	0.3	Phosphorite					68.0	----------
	P-37	3.5	Dolomite, cherty					71.5	----------
	P-36	4.1	Dolomite, sandy, cherty					75.6	----------

Piney Peak, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation--Continued						
	P-35	0.4	Chert					76.0	----------
	P-34	11.0	Dolomite					87.0	----------
	P-33	5.6	Dolomite					92.6	----------
	P-32	1.1	Dolomite, argillaceous					93.7	----------
	P-31	0.3	Sandstone					94.0	----------
	P-30	6.0	Carbonate rock					100.0	----------
	P-29	2.0	Carbonate rock					102.0	----------
	P-28	3.0	Concealed					105.0	----------
	P-27	2.0	Carbonate rock, sandy					107.0	----------
			Lower member of Shedhorn Sandstone						
	P-26	6.5	Sandstone					6.5	----------
	P-25	1.5	Sandstone, silty, calcareous					8.0	----------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation						
			Top of trench.						
CP-16-10	P-24	3.2	Phosphorite	33.38	----	-----	4.00	3.2	106.82
CP-16-9	P-23	0.2	Phosphorite and siltstone	26.59	----	-----	16.91	3.4	*133.41
CP-16-9	P-22	0.2	Siltstone, phosphatic					3.6	
CP-16-9	P-21	0.4	Phosphorite					4.0	
CP-16-9	P-20	0.2	Siltstone, phosphatic					4.2	
[1]CP-16-18	P-19	3.6	Mudstone, silty	0.04	0.13	0.03	83.03	7.8	----------
	P-18	4.3	Mudstone, silty, calcareous					12.1	----------
[1]CP-16-17	P-17	1.3	Mudstone, carbonatic	8.29	0.11	0.45	36.74	13.4	----------
[1]CP-16-16	P-16	2.7	Carbonate rock, silty	3.94	0.08	0.17	25.74	16.1	----------
CP-16-8	P-15	4.4	Phosphorite and mudstone	16.04	0.38	0.39	27.05	20.5	----------
[1]CP-16-15	P-14	1.4	Mudstone, silty	3.82	0.19	0.06	72.27	21.9	----------
	P-13	1.3	Mudstone, silty, phosphatic					23.2	----------
	P-12	1.2	Mudstone, silty					24.4	----------
	P-11	0.9	Mudstone, silty					25.3	----------
CP-16-7	P-10	3.0	Carbonate rock, argillaceous	6.11	0.30	0.74	33.82	28.3	18.33

Piney Peak, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued						
CP-16-6	P-9	3.0	Mudstone, carbonatic, silty----	5.64	0.37	0.35	44.14	31.3	35.25
CP-16-5	P-8	2.2	Phosphorite and mudstone, carbonatic----------	20.31	0.18	0.37	19.66	33.5	102.27
CP-16-5	P-7	1.1	Mudstone, phosphatic, silty----					34.6	
CP-16-4	P-6	0.4	Phosphorite----------	28.82	----	----	6.47	35.0	113.80
CP-16-3	P-5	0.7	Mudstone, silty----------	4.14	----	----	66.75	35.7	116.70
CP-16-2	P-4	0.5	Mudstone, carbonatic----------	7.14	----	----	37.40	36.2	120.27
CP-16-1	P-3	0.7	Phosphorite----------	29.98	----	----	8.39	36.9	141.26
	P-2	0.3	Siltstone----------					37.2	----------
	P-1	0.2	Phosphorite----------					37.4	----------
			Grandeur Member of Park City Formation and Wells Formation, undifferentiated--upper unit only						
	W-29	1.0	Dolomite, sandy----------						
			Base of trench.						

*Cumulative data incomplete. Computations start from zero after interruption.

[1]Chip sample.

EAST DARBY CREEK, WYO., CP-17

NW¼ sec. 34, unsurveyed, T. 43 N., R. 118 W., Teton County, Wyo., on the west side of the Teton Range about 6 miles northeast of Victor, Idaho. The lower part of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation was described and sampled in a hand-excavated trench by E. M. Schell and H. L. Cullins; the remainder of the measurements were made along a Jacob staff traverse by Schell; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--lower part only						
			Upper part of member removed by erosion. Top of trench.						
	P-17	4.0	Siltstone					4.0	----------
	P-16	0.5	Chert and siltstone					4.5	----------
	P-15	3.5	Mudstone, silty					8.0	----------
	P-14	1.6	Mudstone, silty, cherty					9.6	----------
	P-13	2.1	Mudstone, silty, cherty					11.7	----------
	P-12	0.7	Chert					12.4	----------
	P-11	1.1	Siltstone, argillaceous, cherty					13.5	----------
	P-10	1.9	Siltstone, phosphatic					15.4	----------
CP-17-6	P-9	0.95	Mudstone and phosphorite	20.58	0.14	0.14	35.74	16.35	19.55
CP-17-5	P-8	0.8	Phosphorite	36.09	0.05	0.05	3.78	17.15	48.42
CP-17-4	P-7	0.5	Chert					17.65	
CP-17-4	P-6	0.25	Phosphorite, argillaceous, calcareous	19.45	0.09	0.07	43.40	17.9	*63.01
	P-5	1.1	Chert					19.0	----------
CP-17-3	P-4	0.5	Phosphorite	35.69	0.08	0.08	1.72	19.5	17.84
CP-17-2	P-3	1.6	Chert, phosphatic	15.43	0.07	0.09	56.98	21.1	42.53
CP-17-1	P-2	1.4	Phosphorite	34.66	0.07	0.06	1.54	22.5	*91.05
			Base of trench.						
			Lower chert member of Phosphoria Formation						
	P-1	1.0	Chert, sandy					1.0	----------
			Tensleep Sandstone--upper part only						
	T-7	4.5	Dolomite, conglomeratic					4.5	----------

*Cumulative data incomplete. Computations start from zero after interruption.

NORTH FORK MAHOGANY CREEK, IDAHO, CP-18

NE¼NE¼ sec. 18, T. 4 N., R. 44 E., Teton County, Idaho. The Meade Peak Phosphatic Shale Member of the Phosphoria Formation was exposed in a hand-excavated trench, an extension of trench E of Gardner (1944, p. 27-28); the other rock units were measured along a Jacob staff traverse. Rocks described and sampled by W. C. Gere and H. F. Albee; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation						
			Part of this member (10± ft) is probably missing because of faulting.						
	P-21	0.3	Phosphorite, silty, argillaceous----------					0.3	----------
	P-20	4.0	Siltstone, dolomitic----------					4.3	----------
	P-19	0.8	Siltstone, phosphatic----------					5.1	----------
	P-18	3.0	Siltstone----------					8.1	----------
	P-17	0.2	Phosphorite----------					8.3	----------
	P-16	1.2	Dolomite, silty----------					9.5	----------
	P-15	0.2	Phosphorite, argillaceous, silty----------					9.7	----------
	P-14	0.5	Dolomite, silty----------					10.2	----------
	P-13	0.5	Phosphorite, argillaceous----------					10.7	----------
	P-12	0.6	Dolomite, silty----------					11.3	----------
	P-11	0.1	Phosphorite----------					11.4	----------
	P-10	0.2	Siltstone, phosphatic----------					11.6	----------
	P-9	2.2	Mudstone, phosphatic, silty----------					13.8	----------
	P-8	0.6	Carbonate rock, silty----------					14.4	----------
	P-7	0.2	Phosphorite, argillaceous----------					14.6	----------
	P-6	0.2	Mudstone, dolomitic, silty----------					14.8	----------
CP-18-5	P-5	3.2	Phosphorite and mudstone-------	23.95	0.24	0.26	14.55	18.0	76.64
CP-18-4	P-4A	3.0	Phosphorite and mudstone-------	20.06	0.27	0.52	18.37	21.0	136.82
CP-18-3	P-4	1.5	Phosphorite, argillaceous------	25.74	0.21	0.13	15.90	22.5	175.43
CP-18-2	P-3	1.1	Phosphorite, argillaceous------	27.46	0.16	0.13	13.39	23.6	205.64
CP-18-2	P-2	0.1	Mudstone, phosphatic, silty----					23.7	208.39
CP-18-1	P-1	1.6	Phosphorite----------	32.00	0.05	0.02	12.51	25.3	259.59

North Fork Mahogany Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
Grandeur Member of Park City Formation and Wells Formation undifferentiated--upper part only									
	W-14	3.8	Dolomite, sandy----------					3.8	----------
	W-13	2.1	Carbonate rock----------					5.9	----------
	W-12	3.4	Sandstone, carbonatic----------					9.3	----------
	W-11	1.5	Carbonate rock, sandy----------					10.8	----------
			Base of trench.						

MAHOGANY RIDGE, IDAHO, CP-20

NW¼NW¼ sec. 22, T. 4 N., R. 44 E., Teton County, Idaho; trench D of Gardner (1944, p. 25-26) deepened and extended. The Meade Peak and parts of the Retort Phosphatic Shale Members of the Phosphoria Formation were sampled and described by E. M. Schell and W. C. Gere in hand-excavated trenches; the remainder of the stratigraphic section was described along a Jacob staff traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation							
			Upper member of Shedhorn Sandstone							
	P-59	12.0	Sandstone						12.0	--------
			Retort Phosphatic Shale Member of Phosphoria Formation							
	P-58	25.0	Concealed. For description see Gardner (1944, p. 25) Top of trench.						25.0	--------
	P-57	0.9	Phosphorite, calcareous, bioclastic						25.9	--------
	P-56	4.7	Mudstone and phosphorite						30.6	--------
	P-55	0.9	Phosphorite, argillaceous						31.5	--------
	P-54	1.6	Limestone, silty, argillaceous						33.1	--------
[1]CP-20-10	P-53	1.6	Siltstone, argillaceous	2.96	----	----	76.02	-------	34.7	--------
	P-52	0.6	Limestone, sandy						35.3	--------
	P-51	0.6	Phosphorite, cherty, sandy Base of trench.						35.9	--------
			Lower member of Shedhorn Sandstone							
	P-50	18.0	Sandstone, cherty, calcareous						18.0	--------
	P-49	3.0	Sandstone, calcareous						21.0	--------
	P-48	15.0	Sandstone, calcareous						36.0	--------

Mahogany Ridge, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation							
	P-47	1.0	Dolomite, sandy						1.0	--------
	P-46	10.0	Dolomite, sandy, cherty						11.0	--------
	P-45	5.0	Dolomite, sandy						16.0	--------
	P-44	2.0	Dolomite, sandy						18.0	--------
	P-43	2.5	Dolomite, sandy						20.5	--------
	P-42	8.5	Dolomite, sandy						29.0	--------
	P-41	3.0	Dolomite, silty, siliceous						32.0	--------
	P-40	14.0	Dolomite, sandy						46.0	--------
	P-39	9.0	Carbonate rock, sandy, silty						55.0	--------
	P-38	8.0	Siltstone, carbonatic, sandy						63.0	--------
	P-37	0.5	Chert, phosphatic, silty						63.5	--------
	P-36	9.5	Carbonate rock, sandy						73.0	--------
	P-35	13.0	Dolomite, sandy						86.0	--------
	P-34	6.0	Concealed Top of trench.						92.0	--------
	P-33	2.0	Carbonate rock, sandy						94.0	--------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation							
	P-32	0.6	Carbonate rock and phosphorite						0.6	--------
	P-31	0.7	Phosphorite, siliceous						1.3	--------
	P-30	0.5	Phosphorite, silty						1.8	--------
	P-29	1.5	Siltstone						3.3	--------
	P-28	0.9	Phosphorite and siltstone						4.2	--------
	P-27	3.3	Siltstone, siliceous, calcareous						7.5	--------
	P-26	0.2	Phosphorite						7.7	--------
	P-25	1.5	Dolomite, silty						9.2	--------
	P-24	0.5	Phosphorite, argillaceous						9.7	--------
	P-23	0.5	Carbonate rock, silty						10.2	--------
	P-22	2.4	Phosphorite and mudstone						12.6	--------

Mahogany Ridge, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued							
	P-21	0.8	Carbonate rock, silty						13.4	--------
	P-20	2.3	Siltstone, siliceous						15.7	--------
	P-19	0.2	Phosphorite, silty						15.9	--------
	P-18	2.2	Siltstone						18.1	--------
	P-17	0.6	Mudstone, silty						18.7	--------
	P-16	1.6	Carbonate rock, silty						20.3	--------
	P-15	3.0	Siltstone, argillaceous, siliceous						23.3	--------
CP-20-7	P-14	2.4	Phosphorite and mudstone--	20.11	0.13	0.33	21.09	16.02	25.7	--------
[1]CP-20-9	P-13	3.0	Carbonate rock----------	0.02	----	----	7.52	-----	28.7	--------
CP-20-6	P-12	0.1	Mudstone, phosphatic, silty						28.8	
CP-20-6	P-11	0.5	Phosphorite and mudstone--	19.21	0.25	0.36	20.24	18.03	29.3	38.42
CP-20-6	P-10	1.4	Phosphorite, argillaceous-						30.7	
CP-20-5	P-9	0.4	Carbonate rock----------						31.1	
CP-20-5	P-8	0.4	Mudstone, phosphatic-----	2.15	0.11	0.12	8.86	40.84	31.5	40.78
CP-20-5	P-7	0.3	Limestone----------						31.8	
CP-20-4	P-6	1.7	Phosphorite and mudstone--	18.00	0.18	0.31	12.29	21.42	33.5	71.38
CP-20-3	P-5	1.0	Phosphorite, argillaceous-	23.58	0.24	0.31	19.22	11.50	34.5	94.96
CP-20-2	P-4	1.7	Phosphorite----------	32.10	----	----	5.11	-----	36.2	149.53
[1]CP-20-8	P-3	1.7	Carbonate rock----------	0.04	----	----	9.97	-----	37.9	--------
CP-20-1	P-2	0.7	Phosphorite----------						38.6	
CP-20-1	P-1	0.7	Phosphorite----------	30.86	----	----	9.58	-----	39.3	--------
			Base of trench.							
			Grandeur Member of Park City Formation and Wells Formation undifferentiated--upper part only							
	W-9	20.0	Carbonate rock, sandy						20.0	--------

[1]Chip sample.

PATTERSON CREEK RIDGE, IDAHO, CP-21

SW¼NW¼ sec. 34, T. 4 N., R. 44 E., Teton County, Idaho, on ridge southwest of Patterson Creek, trench F of Gardner (1944, p. 28-29). The Meade Peak and Retort Phosphatic Shale Members of the Phosphoria Formation were described and sampled by E. M. Schell and W. C. Gere in two hand-excavated trenches; the remaining intervals were described by Schell along a Jacob staff traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--lower bed only							
			Top of trench.							
	D-1		Mudstone, silty, carbonatic.							
			Retort Phosphatic Shale Member of Phosphoria Formation							
	P-40	0.9	Mudstone, silty----------						0.9	--------
	P-39	10.1	Mudstone, silty----------						11.0	--------
	P-38	4.8	Mudstone----------						15.8	--------
	P-37	0.9	Phosphorite----------						16.7	--------
	P-36	4.0	Mudstone and phosphorite----------						20.7	--------
	P-35	0.7	Siltstone----------						21.4	--------
	P-34	0.2	Phosphorite, argillaceous, calcareous----------						21.6	--------
	P-33	3.3	Siltstone----------						24.9	--------
	P-32	0.6	Siltstone, phosphatic----------						25.5	--------
	P-31	0.2	Phosphorite, sandy, cherty----------						25.7	--------
			Lower member of Shedhorn Sandstone							
	P-30	0.4	Quartzite, phosphatic----------						0.4	--------
			Base of trench. Units P-25 to P-29 are partly concealed.							
	P-29	35.0	Quartzite, phosphatic, calcareous----------						35.4	--------

Patterson Creek Ridge, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation							
	P-28	80.0	Carbonate rock, cherty, sandy						80.0	--------
	P-27	9.5	Siltstone, calcareous						89.5	--------
	P-26	0.5	Phosphorite, chert, and carbonate rock						90.0	--------
	P-25	35.0	Carbonate rock, sandy						125.0	--------
			Top of trench.							
	P-24	2.4	Carbonate rock, sandy						127.4	--------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation							
	P-23	0.6	Phosphorite						0.6	--------
	P-22	1.8	Dolomite, silty, argillaceous						2.4	--------
	P-21	0.2	Phosphorite						2.6	--------
	P-20	0.8	Siltstone						3.4	--------
	P-19	0.2	Phosphorite						3.6	--------
	P-18	2.7	Siltstone, calcareous						6.3	--------
	P-17	3.1	Siltstone and phosphorite						9.4	--------
CP-21-9	P-16	1.1	Phosphorite, argillaceous	17.79	0.22	0.56	28.31	--------	10.5	--------
[1]CP-21-11	P-15	0.5	Phosphorite	31.02	----	----	6.81	--------	11.0	--------
	P-14	0.6	Siltstone, argillaceous						11.6	--------
	P-13	0.5	Phosphorite						12.1	--------
	P-12	0.5	Siltstone, argillaceous						12.6	--------
	P-11	0.9	Siltstone, argillaceous						13.5	--------
	P-10	5.6	Limestone, silty						19.1	--------
	P-9	4.8	Siltstone						23.9	--------
CP-21-8	P-8	3.0	Mudstone and phosphorite	11.46	0.31	0.39	43.07	--------	26.9	34.38
CP-21-7	P-8A	3.0	Carbonate rock, mudstone, and phosphorite	7.70	0.08	0.31	16.83	29.51	29.9	57.48
CP-21-6	P-7	1.3	Phosphorite, argillaceous	19.43	0.40	0.52	24.79	28.49	31.2	82.74
CP-21-5	P-6	1.4	Mudstone, calcareous	7.78	0.66	0.80	39.88	22.54	32.6	93.63
CP-21-4	P-5	2.5	Phosphorite	27.41	0.21	0.28	13.35	9.29	35.1	162.16
CP-21-3	P-4	0.8	Phosphorite	32.33	0.11	0.08	5.88	5.77	35.9	188.02

Patterson Creek Ridge, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued							
[1]CP-21-10	P-3	2.6	Carbonate rock, silty, argillaceous----------	0.06	----	----	14.29	------	38.5	188.18
CP-21-2	P-2	1.1	Phosphorite----------	32.92	----	----	4.39	------	39.6	224.39
CP-21-1	P-1	2.4	Phosphorite----------	32.24	----	----	13.23	------	42.0	301.77
			Grandeur Member of Park City Formation and Wells Formation, undifferentiated--upper part only							
	W-5	1.8	Carbonate rock, sandy----------						1.8	--------
	W-4	0.5	Chert, sandy----------						2.3	--------
	W-3	4.7	Carbonate rock, cherty, sandy----------						7.0	--------
			Base of trench.							
	W-2	7.0	Carbonate rock, sandy, cherty----------						14.0	--------
	W-1	3.0	Siltstone, sandy----------						17.0	--------

[1]Chip sample.

MOSQUITO CREEK, WYO., CP-22

NW¼ sec. 36, unsurveyed, T. 41 N., R. 118 W., Teton County, Wyo., on the ridge north of Mosquito Creek. The Meade Peak and the Retort Phosphatic Shale Members of the Phosphoria Formation were described and sampled in hand-excavated trenches by E. M. Schell and W. C. Gere; the intervening interval was described by Schell along a Brunton and tape traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent)					Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
				P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition		
			Dinwoody Formation--basal units only							
			Top of trench.							
	D-2	5.5	Siltstone, argillaceous, dolomitic						5.5	--------
	D-1	1.6	Mudstone, silty						7.1	--------
			Retort Phosphatic Shale Member of Phosphoria Formation							
	P-71	0.7	Phosphorite, silty, sandy						0.7	--------
	P-70	10.5	Mudstone, silty						11.2	--------
	P-69	0.8	Phosphorite, silty, argillaceous						12.0	--------
	P-68	0.5	Mudstone, silty						12.5	--------
	P-67	0.9	Dolomite, silty, argillaceous						13.4	--------
	P-66	3.4	Mudstone, silty, phosphatic						16.8	--------
	P-65	2.5	Dolomite, siliceous						19.3	--------
	P-64	15.0	Mudstone and dolomite, silty						34.3	--------
	P-63	0.9	Dolomite, siliceous, argillaceous						19.3	--------
	P-62	4.4	Mudstone, silty						39.6	--------
	P-61	0.4	Phosphorite, calcareous						40.0	--------
	P-60	0.6	Phosphorite, calcareous, silty, argillaceous						40.6	--------
	P-59	1.4	Mudstone and phosphorite						42.0	--------
	P-58	4.3	Mudstone (shear zone)						46.3	--------
	P-57	1.3	Phosphorite, silty, sandy						47.6	--------
			Base of trench.							
			Lower member of Shedhorn Sandstone							
	P-56	21.0	Sandstone, calcareous						21.0	--------

Mosquito Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation							
	P-55	9.0	Carbonate rock, siliceous						9.0	--------
	P-54	3.0	Chert						12.0	--------
	P-53	40.0	Mostly concealed. Float consists of carbonate rock and siltstone. Top of trench.						52.0	--------
	P-52	0.7	Sandstone, calcareous						52.7	--------
	P-51	0.6	Dolomite, argillaceous, silty						53.3	--------
	P-50	0.8	Chert, carbonatic						54.1	--------
	P-49	0.9	Dolomite, silty						55.0	--------
	P-48	0.1	Limestone, cherty, silty						55.1	--------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation							
CP-22-11	P-47	1.2	Phosphorite, siliceous	18.17	----	-----	29.69	------	1.2	--------
	P-46	0.2	Mudstone and phosphorite						1.4	--------
	P-45	0.5	Fault zone(?)						1.9	--------
	P-44	0.1	Phosphorite						2.0	--------
	P-43	0.8	Siltstone, argillaceous						2.8	--------
	P-42	0.4	Mudstone, silty						3.2	--------
	P-41	0.5	Siltstone, argillaceous						3.7	--------
	P-40	0.1	Phosphorite, argillaceous						3.8	--------
	P-39	0.3	Siltstone, siliceous						4.1	--------
	P-38	0.2	Mudstone and phosphorite						4.3	--------
	P-37	1.4	Dolomite, silty						5.7	--------
	P-36	0.7	Siltstone, siliceous						6.4	--------
	P-35	1.4	Siltstone, argillaceous						7.8	--------
	P-34	0.2	Phosphorite, argillaceous						8.0	--------
	P-33	1.3	Siltstone						9.3	--------
	P-32	0.5	Phosphorite, argillaceous						9.8	--------
	P-31	1.0	Siltstone						10.8	--------

Mosquito Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued							
CP-22-10	P-30	1.2	Dolomite, siltstone, and phosphorite	14.22	0.05	0.14	32.48	14.37	12.0	17.06
CP-22-9	P-29	1.6	Phosphorite, argillaceous, silty	21.28	0.08	0.19	24.35	9.85	13.6	51.11
CP-22-8	P-28	2.1	Phosphorite, argillaceous, silty	22.32	0.12	0.36	24.02	8.91	15.7	*97.98
	P-27	1.3	Dolomite, silty						17.0	--------
	P-26	0.2	Phosphorite, silty, cherty						17.2	--------
	P-25	2.9	Siltstone						20.1	--------
	P-24	0.7	Chert and siltstone						20.8	--------
	P-23	4.2	Siltstone						25.0	--------
	P-22	2.8	Limestone, silty						27.8	--------
	P-21	1.5	Siltstone						29.3	--------
	P-20	1.4	Siltstone, argillaceous						30.7	--------
CP-22-7	P-19	1.3	Mudstone, silty						32.0	
CP-22-7	P-18	0.7	Limestone, argillaceous, silty						32.7	
CP-22-7	P-17	0.6	Mudstone, silty, phosphatic	3.95	0.18	0.18	25.39	30.15	33.3	13.03
CP-22-7	P-16	0.2	Mudstone, phosphatic, silty						33.5	
CP-22-7	P-15	0.5	Limestone, silty, argillaceous						34.0	
CP-22-6	P-14	1.1	Phosphorite, argillaceous, calcareous	16.36	0.28	0.43	25.02	19.54	35.1	31.03
CP-22-5	P-13	0.5	Limestone, argillaceous						35.6	
CP-22-5	P-12	0.3	Phosphorite, argillaceous, calcareous	18.30	0.10	0.16	5.86	21.16	35.9	65.80
CP-22-5	P-11	0.3	Limestone, argillaceous						36.2	
CP-22-5	P-10	0.2	Phosphorite						36.4	
CP-22-5	P-9	0.6	Limestone, argillaceous						37.0	
CP-22-4	P-8	0.8	Phosphorite	35.15	0.06	0.04	2.07	3.32	37.8	93.92

Mosquito Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued										
CP-22-3	P-7	0.8	Limestone, argillaceous---						38.6	
CP-22-3	P-6	0.3	Phosphorite---	14.15	0.25	0.14	33.65	13.15	38.9	120.80
CP-22-3	P-5	0.5	Siltstone, phosphatic---						39.4	
CP-22-3	P-4	0.3	Mudstone, silty---						39.7	
CP-22-2	P-3	2.5	Phosphorite---	35.55	----	----	1.57	-------	42.2	209.68
CP-22-1	P-2	1.0	Phosphorite, cherty---	28.52	----	----	23.62	-------	43.2	238.20
	P-1	0.4	Conglomerate (chert and phosphorite)---						43.6	-------
Grandeur Member of Park City Formation and Wells Formation undifferentiated--upper part only										
	W-1	4.0	Limestone, sandy---						4.0	-------
			Base of trench.							

*Cumulative data incomplete. Computations start from zero after interruption.

SORENSEN CREEK, WYO., CP-23

SE¼NE¼ sec. 30, unsurveyed, T. 43 N., R. 118 W., Teton County, Wyo., on the north side of Sorensen Creek. The lower chert member and the lower part of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation were described and sampled in a hand-excavated trench and the upper part of the Tensleep Sandstone was measured at a natural exposure by E. M. Schell; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--lower part only				
			Top of trench.				
	P-18	2.5	Dolomite, silty			2.5	-------
	P-17	1.3	Siltstone, argillaceous			3.8	-------
	P-16	1.7	Mudstone, silty			5.5	-------
	P-15	2.4	Dolomite, silty			7.9	-------
	P-14	0.9	Siltstone, siliceous			8.8	-------
CP-23-8	P-13	0.7	Phosphorite and mudstone	19.50	35.43	9.5	13.65
CP-23-7	P-12	0.9	Phosphorite	34.49	3.44	10.4	*44.69
	P-11	1.3	Chert, spicular			11.7	-------
CP-23-6	P-10	0.5	Chert and phosphorite	6.99	64.68	12.2	3.49
CP-23-5	P-9	0.9	Phosphorite	34.51	1.49	13.1	*34.55
	P-8	4.3	Chert, spicular			17.4	-------
CP-23-4	P-7	0.9	Phosphorite	34.61	4.35	18.3	31.15
CP-23-3	P-6	0.6	Dolomite, phosphatic			18.9	
CP-23-3	P-5	0.3	Phosphorite	13.74	6.69	19.2	46.26
CP-23-3	P-4	0.2	Dolomite			19.4	
CP-23-2	P-3	1.4	Phosphorite	36.14	1.64	20.8	*96.86
			Lower chert member of Phosphoria Formation				
	P-2	1.2	Chert, spicular			1.2	-------
CP-23-1	P-1	1.1	Phosphorite, cherty	20.44	37.06	2.3	-------
			Base of trench.				

Sorensen Creek, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent)		Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
				P_2O_5	Acid insoluble		
			Tensleep Sandstone--upper part only				
	T-5	14.0	Dolomite----------			14.0	---------
	T-4	3.0	Sandstone, dolomitic----------			17.0	---------
	T-3	6.0	Sandstone----------			23.0	---------
	T-2	5.0	Dolomite, sandy----------			28.0	---------
	T-1	8.0	Sandstone----------			36.0	---------

*Cumulative data incomplete. Computations start from zero after interruption.

CANYON CREEK, IDAHO, CP-24

SW¼SW¼ sec. 2, SE¼SE¼ sec. 3, and NW¼SW¼ sec. 12, T. 4 N., R. 43 E., Teton County, Idaho. The Meade Peak and Retort Phosphatic Shale Members of the Phosphoria Formation were described and sampled by E. M. Schell and W. C. Gere in hand-excavated trenches; the remaining intervals were described by Schell along a Brunton and tape traverse; analyses by K. P. Moore.

Stratigraphic section in SW¼SW¼ sec. 2 and SE¼SE¼ sec. 3

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--basal part only							
			Top of trench.							
	D-1	3.0	Siltstone, argillaceous						3.0	---
			Retort Phosphatic Shale Member of Phosphoria Formation							
	P-49	0.5	Phosphorite and sandstone						0.5	---
	P-48	3.0	Siltstone, calcareous						3.5	---
	P-47	1.7	Mudstone, silty						5.2	---
	P-46	0.6	Siltstone, dolomitic						5.8	---
	P-45	1.2	Siltstone, argillaceous						7.0	---
	P-44	2.0	Mudstone, silty						9.0	---
	P-43	0.8	Mudstone, silty						9.8	---
	P-42	14.8	Mudstone, silty, dolomitic						24.6	---
	P-41	1.0	Phosphorite						25.6	---
	P-40	0.7	Mudstone and phosphorite						26.3	---
	P-39	1.9	Mudstone, silty						28.2	---
	P-38	1.2	Mudstone						29.4	---
CP-24-8	P-37	1.2	Phosphorite, argillaceous	24.41	---	---	15.61	8.10	30.6	---
			Lower member of Shedhorn Sandstone							
	P-36	0.7	Siltstone						0.7	---
	P-35	0.3	Chert						1.0	---
	P-34	2.4	Chert, sandy						3.4	---
			Base of trench.							
	P-33	20.0	Sandstone						23.4	---
	P-32		Concealed interval of unknown thickness.							

Canyon Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Franson Member of Park City Formation							
	P-31	18.0	Dolomite, silty						18.0	---
	P-30	10.0	Siltstone, dolomitic						28.0	---
	P-29	1.5	Sandstone, cherty						29.5	---
	P-28	1.0	Carbonate rock						30.5	---
	P-27	3.5	Siltstone, dolomitic						34.0	---
	P-26	2.5	Dolomite						36.5	---
	P-25	27.0	Carbonate rock, sandy						63.5	---
	P-24	10.0	Concealed						73.5	---
	P-23	7.0	Limestone, sandy						80.5	---
			Meade Peak Phosphatic Shale Member of Phosphoria Formation							
CP-24-7	P-22	1.8	Phosphorite, cherty	23.18	----	----	20.14	7.93	1.8	---
	P-21	2.0	Fault gouge. Unknown thickness of Meade Peak missing						3.8	---
	P-20	1.0	Siltstone						4.8	---
	P-19	0.3	Phosphorite, argillaceous						5.1	---
	P-18	2.1	Dolomite, silty						7.2	---
	P-17	1.1	Siltstone, argillaceous						8.3	---
	P-16	0.5	Phosphorite, argillaceous						8.8	---
	P-15	1.3	Siltstone, argillaceous						10.1	---
	P-14	0.5	Phosphorite, argillaceous						10.6	---
	P-13	0.5	Limestone, argillaceous						11.1	---
	P-12	0.3	Phosphorite, argillaceous						11.4	---
	P-11	0.2	Siltstone, argillaceous						11.6	---
	P-10	3.5	Dolomite, silty						15.1	---
	P-9	0.5	Siltstone, argillaceous						15.6	---
	P-8	4.3	Carbonate rock and siltstone						19.9	---

Canyon Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued							
CP-24-6	P-7	2.0	Mudstone, silty----------	9.11	0.32	0.35	50.97	14.42	21.9	18.22
CP-24-5	P-6	2.5	Mudstone, phosphatic------	13.27	0.21	0.51	39.27	16.93	24.4	51.40
CP-24-4	P-5	2.0	Mudstone, phosphatic, carbonatic----------	14.02	0.20	0.40	27.40	16.80	26.4	79.44
CP-24-3	P-4	1.6	Phosphorite----------	28.52	0.11	0.18	14.88	5.66	28.0	125.07
CP-24-2	P-3	1.8	Mudstone, calcareous------	1.26	----	----	52.20	18.80	29.8	127.34
CP-24-1	P-2	1.8	Phosphorite----------	33.28	----	----	9.08	2.71	31.6	187.24
[1]CP-24-9	P-1	0.9	Sandstone----------	6.38	----	----	77.95	-----	32.5	---------
			Grandeur Member of Park City Formation and Wells Formation, undifferentiated--upper part only							
	W-1	1.4	Dolomite----------						1.4	---------
			Base of trench.							

Stratigraphic section in NW¼SW¼ sec. 12
The Meade Peak Phosphatic Shale Member of the Phosphoria Formation is slumped and faulted.
The section presented has limited value.

			Franson Member of Park City Formation--lower part only							
	P-22	2.0	Carbonate rock, sandy----------						2.0	---------
			Meade Peak Phosphatic Shale Member of Phosphoria Formation							
CP-24-12	P-21	1.0	Phosphorite----------	30.13	0.01	0.04	11.25	3.48	1.0	30.13
CP-24-11	P-20	0.8	Phosphorite, argillaceous-	15.75	0.21	0.29	31.43	9.70	1.8	*42.73
	P-19	3.5	Dolomite, silty----------						5.3	---------
	P-18	0.7	Siltstone----------						6.0	---------
	P-17	8.0	Dolomite and siltstone----------						14.0	---------
	P-16	0.7	Phosphorite and siltstone----------						14.7	---------
	P-15	2.0	Carbonate rock, silty----------						16.7	---------
CP-24-10	P-14	0.6	Phosphorite, argillaceous-	16.92	0.09	0.14	26.86	12.58	17.3	---------
	P-13	0.8	Carbonate rock, argillaceous----------						18.1	---------

Canyon Creek, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued							
CP-24-9	P-12	1.4	Phosphorite and mudstone-	23.15	0.31	0.24	26.29	4.73	19.5	--------
	P-11	2.2	Carbonate rock, silty----------						21.7	--------
	P-10	0.8	Phosphorite, argillaceous----------						22.5	--------
	P-9	8.0	Siltstone and carbonate rock----------						30.5	--------
	P-8	0.7	Mudstone, silty----------						31.2	--------
CP-24-8	P-7	3.0	Carbonate rock, argillaceous----------	5.99	0.16	0.25	34.34	21.81	34.2	17.97
CP-24-7	P-7A	3.0	Mudstone, phosphatic------	14.46	0.26	0.50	46.20	7.37	37.2	61.35
CP-24-6	P-6	1.4	Phosphorite and mudstone--	27.01	0.19	0.29	14.41	5.44	38.6	99.16
CP-24-5	P-5	0.4	Phosphorite----------	30.63	0.08	0.09	4.82	4.50	39.0	111.41
CP-24-4	P-4	1.0	Carbonate rock----------	6.67	0.02	0.03	3.41	35.19	40.0	118.08
CP-24-3	P-3	1.0	Phosphorite, argillaceous-	22.85	0.18	0.15	26.90	4.79	41.0	140.93
CP-24-2	P-2	1.1	Phosphorite----------	33.84	0.05	0.04	3.19	3.96	42.1	178.15
CP-24-1	P-1	1.2	Phosphorite, sandy--------	24.16	0.03	0.03	19.66	7.72	43.3	207.14
			Grandeur Member of Park City Formation and Wells Formation undifferentiated--upper part only							
	W-1	2.1	Carbonate rock----------						2.1	--------
	W-4	11.0	Carbonate rock, sandy----------						13.1	--------
	W-3	1.5	Carbonate rock, sandy, silty----------						14.6	--------
	W-2	2.0	Carbonate rock, sandy----------						16.6	--------
	W-1	1.0	Chert----------						17.6	--------

[1]Chip sample.

*Cumulative data incomplete. Computations start from zero after interruption.

SURVEY PEAK, WYO., CP-25

NW¼SW¼ sec. 13, T. 47 N., R. 117 W., Teton County, Wyo., on the southwest side of Survey Peak. The uppermost Permian units of unknown thickness are concealed beneath volcanic rocks. The rocks were described by E. M. Schell in three hand-excavated trenches and along a Jacob staff traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Al_2O_3	Acid insoluble	Cumulative thickness (feet)
			Upper member of Shedhorn Sandstone--top not exposed				
			Top of trench.				
	P-21	2.0	Sandstone				2.0
			Base of trench.				
	P-20	9.0	Concealed				11.0
			Tosi Chert Member of Phosphoria Formation				
	P-19	28.0	Chert breccia and sandstone				28.0
	P-18	20.0	Chert, carbonatic, silty				48.0
			Top of trench.				
	P-17	10.0	Chert and siltstone				58.0
			Retort Phosphatic Shale Member of Phosphoria Formation				
CP-24-2	P-16	0.8	Phosphorite, cherty	27.89	-----	21.97	0.8
			Lower member of Shedhorn Sandstone				
[1]CP-25-4	P-15	0.7	Sandstone	2.65	-----	89.85	0.7
			Base of trench.				
	P-14	25.0	Sandstone, calcareous				25.7
	P-13	7.0	Sandstone				32.7
	P-12	11.0	Sandstone				43.7
	P-11	3.0	Sandstone, calcareous				46.7
			Rex Chert Member of Phosphoria Formation				
	P-10	13.0	Chert breccia				13.0
			Top of trench.				
	P-9	5.0	Chert				18.0

Survey Peak, Wyo--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Al_2O_3	Acid insoluble	Cumulative thickness (feet)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation				
	P-8	0.2	Sandstone, cherty, phosphatic				0.2
	P-7	0.9	Dolomite				1.1
	P-6	0.2	Sandstone, cherty, phosphatic				1.3
	P-5	1.3	Carbonate rock, sandy				2.6
[1]CP-25-3	P-4	1.1	Mudstone	0.54	----	78.41	3.7
CP-25-1	P-3	0.4	Sandstone, cherty	6.23	2.30	76.67	4.1
			Lower member of Shedhorn Sandstone				
	P-2	2.7	Carbonate rock, sandy Base of trench.				2.7
	P-2A	2.5	Similar to unit P-2				5.2
	P-1	7.0	Sandstone, calcareous				12.2
			Tensleep Sandstone--upper part only				
	T-5	8.0	Carbonate rock, sandy				8.0
	T-4	18.0	Carbonate rock, sandy				26.0
	T-3	8.0	Sandstone, calcareous				34.0
	T-2	33.0	Concealed				67.0
	T-1	11.0	Breccia, carbonate rock, and chert				78.0

[1]Chip sample.

JACKSON LAKE, WYO., CP-27

SE¼ sec. 31, unsurveyed, T. 47 N., R. 115 W., Teton County, Wyo.; a partial section of the Permian rocks exposed just beneath the high-water line of Jackson Lake. Described along a Brunton and tape traverse by E. M. Schell and W. C. Gere; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	Chemical analyses (percent) Acid insoluble	Cumulative thickness (feet)
			Dinwoody Formation--basal unit only			
	D-1	17.5	Carbonate rock, silty----------			17.5
			Upper member of Shedhorn Sandstone			
	P-14	2.8	Chert, spicular----------			2.8
	P-13	2.4	Sandstone, calcareous----------			5.2
	P-12	6.3	Carbonate rock, sandy----------			11.5
	P-11	27.3	Sandstone, calcareous----------			38.8
	P-10	6.4	Concealed----------			45.2
			Tosi Chert Member of Phosphoria Formation			
	P-9	5.6	Chert and sandstone----------			5.6
	P-8	2.9	Chert and sandstone----------			8.5
	P-7	1.7	Chert, sandy----------			10.2
	P-6	7.6	Chert, sandy----------			17.8
	P-5	7.5	Chert and sandstone----------			25.3
	P-4	21.2	Chert, silty----------			46.5
			Retort Phosphatic Shale Member of Phosphoria Formation			
	P-3	12.3	Concealed----------			12.3
CP-27-1	P-2	1.1	Phosphorite, sandy----------	27.47	20.36	13.4
			Lower member of Shedhorn Sandstone--upper part only			
[1]CP-27-2	P-1	9.7	Sandstone---------- Concealed.	6.02	74.10	9.7

[1]Chip sample.

ARGUMENT RIDGE, IDAHO, CP-28

SE¼ sec. 24, T. 4 N., R. 42 E., Madison County, Idaho, on the south side of Argument Ridge. Bulldozer exposure of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation described and sampled by W. C. Gere; overlying rocks described along a tape and Brunton traverse by Gere and E. M. Schell; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent)					Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
				P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition		
			Dinwoody Formation--lower unit only							
	D-1		Siltstone, carbonatic.							
			Erosional remnant of Retort Phosphatic Shale Member of Phosphoria Formation							
	P-54	0.3	Phosphorite						0.3	--------
			Lower member of Shedhorn Sandstone							
	P-53	3.0	Sandstone, cherty						3.0	--------
			Rex Chert Member of Phosphoria Formation							
	P-52	20.0	Chert, sandy, carbonatic						20.0	--------
			Franson Member of Park City Formation							
	P-51	7.6	Limestone, cherty						7.6	--------
	P-50	23.4	Carbonate rock						31.0	--------
	P-49	3.0	Concealed						34.0	--------
	P-48	15.0	Carbonate rock						49.0	--------
	P-47	12.0	Carbonate rock, silty						61.0	--------
	P-46	2.0	Carbonate rock, silty						63.0	--------
	P-45	8.0	Carbonate rock, cherty						71.0	--------
	P-44	5.0	Carbonate rock, cherty, silty						76.0	--------
	P-43	10.0	Siltstone, carbonatic						86.0	--------
	P-42	8.0	Carbonate rock, sandy						94.0	--------
	P-41	6.0	Sandstone, calcareous						100.0	--------
	P-40	21.0	Carbonate rock, sandy						121.0	--------
	P-39	1.5	Sandstone, calcareous						122.5	--------
	P-38	12.5	Chert and carbonate rock						135.0	--------

Argument Ridge, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Meade Peak Phosphatic Shale Member of Phosphoria Formation							
CP-28-37	P-37	2.3	Phosphorite----------	31.67	----	----	10.86	--------	2.3	72.84
CP-28-36	P-36	1.5	Phosphorite, siltstone, and dolomite----------	20.53	----	----	31.21	--------	3.8	103.63
CP-28-35	P-35	1.8	Mudstone, silty----------	0.08	0.50	0.18	73.61	8.01	5.6	103.77
CP-28-34	P-34	0.7	Siltstone----------	0.02	0.21	0.04	80.41	7.81	6.3	103.78
CP-28-33	P-33	1.4	Mudstone, silty----------	4.49	0.23	0.20	65.22	12.33	7.7	110.07
CP-28-32	P-32	1.4	Mudstone, silty, dolomitic	6.08	0.31	0.36	57.83	17.85	9.1	118.58
CP-28-31	P-31	3.1	Mudstone, silty, dolomitic	0.91	0.07	0.05	50.88	22.50	---------	-------
CP-28-30	P-30	0.6	Mudstone, dolomitic------	3.25	0.19	0.58	43.43	30.98	---------	-------
			Units 30 and 31 are probably repetitions of units 28 and 29 because of faulting.							
CP-28-29	P-29	3.7	Mudstone, silty, dolomitic-	0.91	0.08	0.05	61.36	17.26	12.8	121.95
CP-28-28	P-28	1.1	Mudstone, dolomitic------	3.60	0.21	0.46	42.85	30.87	13.9	125.91
CP-28-27	P-27	2.0	Carbonate rock, silty----	0.36	0.09	0.06	37.05	28.25	15.9	126.63
CP-28-26	P-26	0.9	Phosphorite, silty, carbonatic----------	15.04	0.23	0.39	30.47	18.23	16.8	140.17
CP-28-25	P-25	1.3	Carbonate rock, silty----	0.24	0.06	0.04	22.28	34.65	18.1	140.48
CP-28-24	P-24	1.3	Mudstone, carbonatic-----	7.70	0.18	0.45	36.55	25.63	19.4	150.49
CP-28-23	P-23	2.8	Phosphorite and carbonate rock----------	23.81	0.29	0.18	10.69	20.17	22.2	217.16
CP-28-22	P-22	2.2	Carbonate rock and mudstone, silty----------	0.68	0.11	0.14	31.97	30.43	24.4	218.66
CP-28-21	P-21	3.7	Carbonate rock, argillaceous----------	4.05	0.37	0.43	38.83	34.76	28.1	233.64
CP-28-20	P-20	0.8	Dolomite, silty----------	0.10	0.20	0.05	28.89	35.34	28.9	233.72
CP-28-19	P-19	2.0	Siltstone and mudstone, carbonatic----------	0.16	0.48	0.20	63.36	17.17	30.9	234.04
CP-28-18	P-18	3.3	Mudstone, carbonatic, phosphatic----------	12.38	0.28	0.31	31.00	20.91	34.2	274.89

Argument Ridge, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
Meade Peak Phosphatic Shale Member of Phosphoria Formation--Continued										
CP-28-17	P-17	2.3	Phosphorite, argillaceous, carbonatic	15.51	0.25	0.33	27.83	19.66	36.5	310.56
CP-28-16	P-16	1.4	Carbonate rock, phosphatic, argillaceous	13.42	0.24	0.47	29.43	22.44	37.9	329.35
CP-28-15	P-15	1.3	Mudstone, carbonatic, phosphatic	7.25	0.12	0.20	49.19	16.34	39.2	338.77
CP-28-14	P-14	2.0	Carbonate rock, argillaceous, phosphatic	7.60	0.22	0.52	36.12	26.75	41.2	353.97
CP-28-13	P-13	1.3	Phosphorite and mudstone	21.44	0.35	0.22	16.04	18.09	42.5	381.84
CP-28-12	P-12	1.8	Carbonate rock, argillaceous	1.50	0.12	0.03	40.86	23.65	44.3	384.54
CP-28-11	P-11	0.6	Mudstone, silty	2.22	0.27	0.09	72.66	8.14	44.9	385.87
CP-28-10	P-10	1.4	Mudstone, carbonatic	4.89	0.18	0.49	54.56	9.01	46.3	392.72
CP-28-9	P-9	2.1	Mudstone, carbonatic	6.64	0.30	0.54	41.57	27.44	48.4	406.66
CP-28-8	P-8	0.4	Mudstone, carbonatic	0.00	0.25	0.11	53.63	29.13	48.8	406.66
CP-28-7	P-7	2.0	Mudstone, phosphatic, carbonatic	13.16	0.30	0.39	30.08	20.42	50.8	432.98
CP-28-6	P-6	1.0	Phosphorite, argillaceous	20.18	0.32	0.53	25.53	12.31	51.8	453.16
CP-28-5	P-5	1.1	Phosphorite, argillaceous	24.62	0.07	0.17	20.16	8.16	52.9	480.24
CP-28-4	P-4	0.5	Phosphorite	29.24	0.08	0.14	10.07	7.13	53.4	494.86
CP-28-3	P-3	1.2	Mudstone	7.59	0.39	0.18	63.73	7.26	54.6	503.97
CP-28-2	P-2	0.7	Phosphorite	27.99	----	----	4.55	-------	55.3	523.56
CP-28-1	P-1	1.2	Phosphorite	31.59	----	----	14.69	-------	56.5	561.47
Grandeur Member of Park City Formation and Wells Formation undifferentiated--upper unit only										
	W-1	3.0	Carbonate rock, silty						3.0	-------

DRY CANYON, IDAHO, CP-29

NE¼NE¼ sec. 19 and SW¼NW¼ sec. 20, T. 1 N., R. 46 E., Bonneville County, Idaho. The Meade Peak and Retort Phosphatic Shale Members of the Phosphoria Formation were described and sampled by E. M. Schell in hand-excavated trenches; the remainder of the Phosphoria Formation was described along a Brunton and tape traverse; analyses by K. P. Moore.

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical anlyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative)
			Dinwoody Formation--lower unit only							
	D-1	3.0	Top of trench. Siltstone, calcareous						3.0	---
			Retort Phosphatic Shale Member of Phosphoria Formation							
CP-29-20	P-36	1.0	Phosphorite	27.25	0.02	0.04	11.72	4.82	1.0	27.25
CP-29-19	P-35	2.3	Siltstone, argillaceous	1.78	0.05	0.08	71.31	6.03	3.3	31.34
CP-29-18	P-34	1.1	Phosphorite, sandy	20.62	0.03	0.04	35.49	4.09	4.4	54.02
			Lower member of Shedhorn Sandstone							
CP-29-17	P-33	0.8	Sandstone	5.71	----	----	77.47	-------	0.8	*58.59
	P-32	2.0	Sandstone						2.8	---
	P-31	29.0	Base of trench. Sandstone						31.8	---
			Franson Member of Park City Formation							
	P-30	46.0	Carbonate rock						46.0	---
	P-29	10.0	Carbonate rock, silty						56.0	---
			Rex Chert Member of Phosphoria Formation							
	P-28	44.0	Chert, carbonatic						44.0	---
			Franson Member of Park City Formation							
	P-27	5.0	Dolomite, sandy						5.0	---
	P-26	0.6	Chert and phosphorite						5.6	---
	P-25	6.0	Carbonate rock						11.6	---
	P-24	6.0	Dolomite, sandy						17.6	---
	P-23	3.0	Carbonate rock, sandy						20.6	---
	P-22	0.4	Phosphorite, calcareous						21.0	---
	P-21	2.0	Carbonate rock						23.0	---
	P-20	30.0	Dolomite, cherty						53.0	---
			Top of trench.							

Dry Canyon, Idaho--Continued

Sample No.	Unit No.	Thickness (feet)	Rock description	Chemical analyses (percent) P_2O_5	V_2O_5	Cr_2O_3	Acid insoluble	Loss on ignition	Cumulative thickness (feet)	Thickness x percent P_2O_5 (cumulative
			Meade Peak Phosphatic Shale Member of Phosphoria Formation[1]							
CP-29-16	P-19	1.6	Phosphorite----------	33.65	----	----	9.88	--------	1.6	53.84
CP-29-15	P-18	1.2	Dolomite----------}	11.29	0.08	0.06	44.54	10.83	2.8	79.81
CP-29-15	P-17	1.1	Siltstone, phosphatic-----}						3.9	
CP-29-14	P-16	4.3	Phosphorite, dolomitic, argillaceous----------	13.31	0.29	0.31	27.20	25.87	8.2	137.04
CP-29-13	P-15	1.5	Phosphorite, dolomitic----	21.35	----	----	11.56	-------	9.7	169.06
CP-29-12	P-14	1.2	Dolomite, silty----------	0.06	----	----	43.82	-------	10.9	169.13
CP-29-11	P-13	0.9	Dolomite, silty----------	0.04	----	----	23.48	-------	11.8	169.17
CP-29-10	P-12	1.4	Dolomite, argillaceous----	0.08	----	----	30.48	-------	13.2	169.28
CP-29-9	P-11	1.3	Siltstone, cherty, dolomitic	8.64	----	----	36.02	-------	14.5	180.51
CP-29-8	P-10	3.6	Limestone----------	5.98	----	----	14.21	-------	18.1	202.04
CP-29-7	P-9	2.0	Phosphorite, carbonatic---	20.73	----	----	14.87	-------	20.1	243.50
CP-29-6	P-8	2.4	Phosphorite, calcareous---	22.77	----	----	8.50	-------	22.5	298.15
CP-29-5	P-7	2.3	Dolomite----------	1.14	0.02	0.03	3.31	-------	24.8	300.77
CP-29-4	P-6	0.9	Phosphorite----------	25.38	0.09	0.18	12.81	-------	25.7	323.61
CP-29-3	P-5	0.7	Siltstone, carbonatic-----	0.51	----	----	64.85	-------	26.4	323.97
CP-29-2	P-4	1.1	Phosphorite----------	26.32	----	----	7.65	-------	27.5	352.92
CP-29-1	P-3	2.2	Phosphorite, cherty-------}						29.7	411.20
CP-29-1	P-2	0.3	Siltstone, argillaceous---}	26.49	----	----	17.89	-------	30.0	419.15
CP-29-1	P-1	0.2	Phosphorite, cherty-------}						30.2	424.45
			Grandeur Member of Park City Formation--upper unit only							
	G-1	1.2	Carbonate rock----------						1.2	--------
			Base of trench.							

*Cumulative data incomplete. Computations start from zero after interruption.

[1]The Meade Peak Phosphatic Shale Member has been thinned by a near bedding-plane fault.


BOUND BY
HNM