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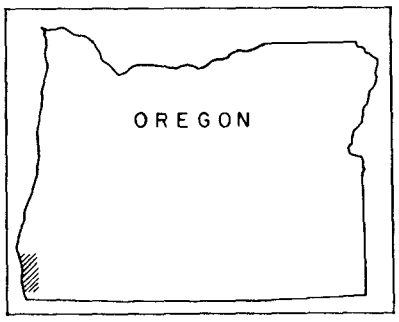
LATE JURASSIC UNCONFORMITY EXPOSED IN SOUTHWESTERN OREGON

By R. H. Dott, Jr.*



Location of area described.

Introduction

Although for many years the Late Jurassic Nevadan orogeny has been considered the most profound and widespread single tectonic event represented on the Pacific Coast, surprisingly little evidence was known for dating it accurately. Most recent workers in southwestern Oregon have considered major mountain building and metamorphism to have occurred during latest Jurassic time, that is, prior to deposition of the lower Myrtle Group (Riddle Formation) of the Roseburg region and the Otter Point Formation (Koch, 1966) of the Oregon coast. Both formations are of Portlandian (Late Jurassic) age. But not one locality could be cited in which a pre-Portlandian age for the orogenesis was proven definitively by a closely dated unconformity. The crucial contact is almost everywhere concealed or faulted.

In 1959 an unconformity was discovered on the Elk River near Port Orford where the massive Humbug Mountain Conglomerate (Koch, 1966), which was assumed to be entirely of Early Cretaceous age, rests upon older meta-sediments. Nearby, the meta-sediments are intruded by the Pearse Peak Diorite (Koch and others, 1961). Subsequently, Koch (1966) studied an extensive sequence of unmetamorphosed Portlandian sediments farther south near Rogue River (the Otter Point Formation). But, though he discovered many new fossil localities and showed for the first time that strata of Portlandian age contained important volcanic rocks, he was unable to find an exposed basal contact. In the Collier Butte area, 15 miles southeast of the lower Rogue River area, Burt (1963) and Schwab (1963) showed that the

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Dothan Formation has been metamorphosed to schists mapped as the Colebrooke Schist by J. S. Diller (1903), and that outliers of unmetamorphosed Portlandian and Cretaceous strata apparently rest unconformably upon a metamorphic and igneous complex that was affected by orogeny. Moreover, the Portlandian and Early Cretaceous sediments contain fragments of schist, vein quartz, diorite, potash feldspar, and probably serpentinite. But the elusive unconformity was not clearly exposed there, either!

Finally, in July 1965, I was fortunate in finding an exposed unconformity with very clear stratigraphic relationships and faunal age control near Barklow Mountain on the divide between Johnson Creek drainage and the North Fork of Elk River. The area is on the line between the Powers and Agness 15-minute quadrangles, 10 miles southwest of Powers and 18 miles east of Port Orford (fig. 1). At last it is possible to point to definitive evidence in southwestern Oregon of the pre-Portlandian age of the Nevadan event.

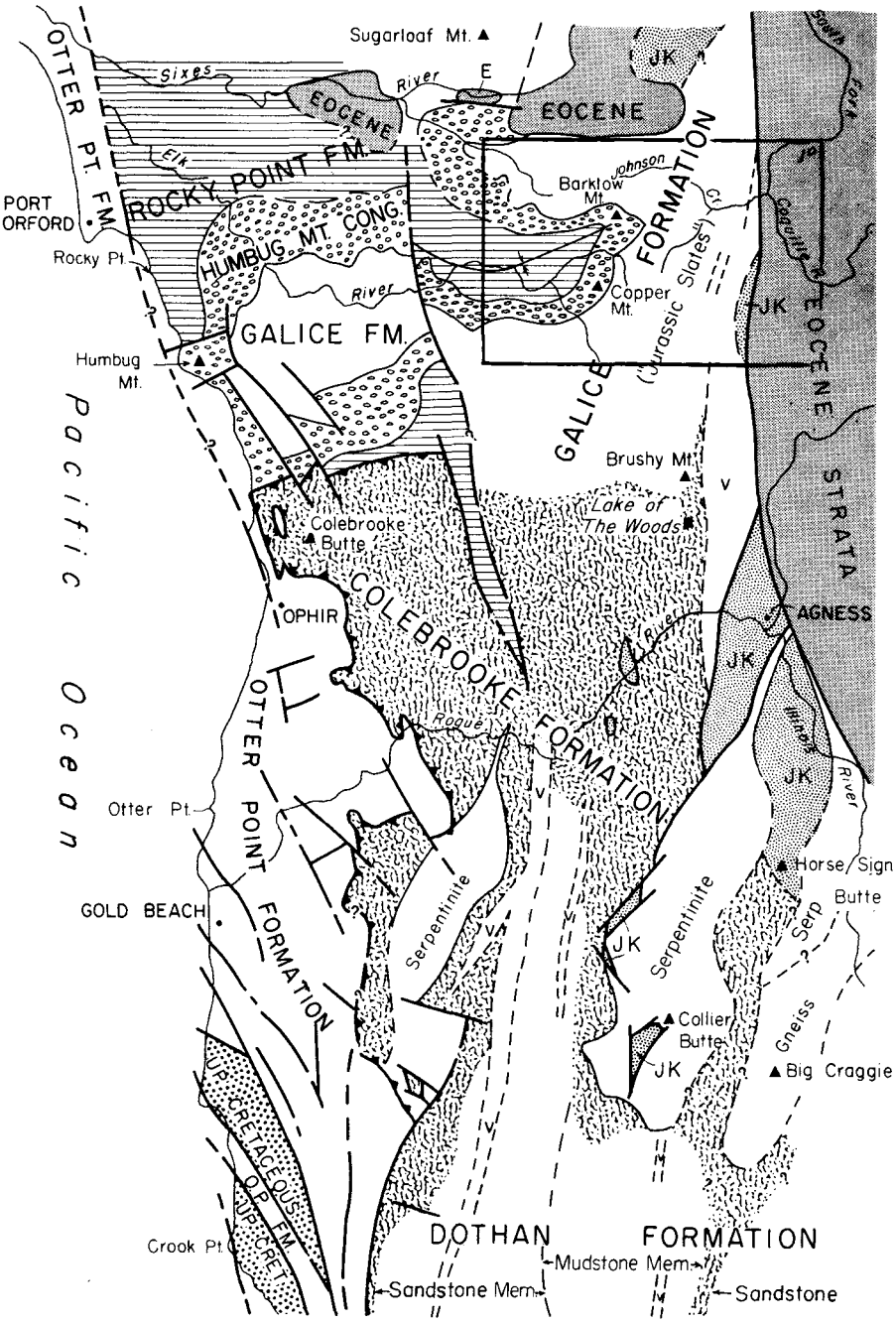
In addition to demonstrating the nature of the basal Portlandian contact, a structurally undisturbed (though poorly exposed) relation between Portlandian and Early Cretaceous strata is also preserved on Barklow Mountain. Koch (1966) postulated an unconformity between them on the basis of subtle petrographic differences and differing degrees and patterns of deformation. On Barklow Mountain, fossiliferous Cretaceous conglomerate is concordant with similar-appearing fossiliferous Portlandian conglomerate, so that if any discontinuity exists between them here it must be minor.

An Enigma in Diller's Mapping in the Port Orford Folio

"Jurassic Slates"

In mapping the old 30-minute Port Orford quadrangle, J. S. Diller (1903) lumped vast areas of exposed semi-slates and slightly foliated sandstones with the typically unmetamorphosed "Myrtle Formation," which he had named earlier in the Roseburg area. In 1903 the entire "Myrtle Formation," later elevated to group rank, was regarded as of Cretaceous age.

Figure 1. Generalized geologic and index map of part of southwestern Oregon showing distribution of major stratigraphic units now recognized (most igneous plutons omitted for clarity; JK - undifferentiated latest Jurassic and Early Cretaceous strata, essentially synonymous with Myrtle Group; v - volcanic rocks). Note lateral metamorphic gradation (dotted line) from Galice Formation south into schists of the Colebrooke Formation and, in turn, gradation from schist to the essentially unmetamorphosed Dothan Formation farther south. Boundary between Otter Point and Colebrooke Formations is shown as a thrust fault as suggested in Dott (1965) and by U.S. Geological Survey personnel. Detail of outlined area is shown in figure 2. (Scale: 1 inch = approximately 5.6 miles.) →


Sugarloaf Mt.
Sixes River
EOCENE
EOCENE
JK
South Fork
Elk
ROCKY POINT FM.
OTTER PT. FM.
PORT ORFORD
Rocky Pt.
HUMBUG MT. CONG.
Johnson
Barklow Mt.
Seaside
GALICE FORMATION
(Jurassic Slates)
Copper Mt.
JK
EOCENE
River
GALICE FM.
Humbug Mt.
Brushy Mt.
STRATA
Lake of The Woods
Colebrooke Butte
COLEBROOKE FORMATION
OPHIR
AGNESS
Pacific Ocean
OTTER POINT FORMATION
Rogue River
JK
Illinois River
Otter Pt.
Horse Sign Butte
GOLD BEACH
Serpentinite
Serp
JK
Collier Butte
Gneiss
JK
Big Craggie
UP. CRETACEOUS
UP. CRET.
Crook Pt.
DOTHAN FORMATION
Mudstone Mem.
Sandstone Mem.
Sandstone

The lumping was done in spite of the fact that Diller's party had found pre-Myrtle fossils in an area of slaty rocks on Sucker Creek 3 miles east of Barklow Mountain (fig. 2). Diller acknowledged that some definitely older ("Jurassic") slates were included in the "Myrtle Formation" as mapped.

> "It is certain that near the divide between Elk River and Johnson Creek ... Jurassic slates occur, but their area must be small. The Jurassic sediments closely resemble those of the Myrtle Formation, and in the field they were not separated. The crest of Barklow Mountain is well characterized by an abundance of Aucella crassicollis, and the whole was mapped as belonging to the Myrtle Formation." (Diller, 1903, p. 2, column 3).

Fossils in the slates were compared to those of the Mariposa Slates of the Sierra Nevada, California. Wells and Peck (1961) later recognized the distinctiveness of the Johnson Creek slates and referred them to the Galice Formation of Kimmeridgian age; it is still correlated with the Mariposa.

Diller shrewdly recognized a pattern to the distribution of the Mesozoic fossils of the Port Orford quadrangle such that Aucella piochii (Gabb) (now referred to the genus Buchia) occurred along a line extending south-southwest from the vicinity of Powers through Copper Mountain to the vicinity of Ophir on the coast about 10 miles north of Gold Beach. The "Jurassic slates" of Johnson Creek lay near this line and the Cretaceous fossil Aucella crassicollis Keyserling (also now referred to the genus Buchia) occurred both to the east and west of it. Thus an "anticlinal arch" was inferred (Diller, 1903, p. 2, columns 3 and 4), but Diller did not discern the complete significance of this "arch" with respect to the full extent of the "Jurassic slates." Curously, however, careful scrutiny of Diller's and his associate's field notes*, combined with examination of key localities mentioned therein, has showed that in the field the party actually observed the distinctive slates over a very large region. In several areas they even found unmetamorphosed, fossiliferous conglomerate and sandstone overlying the slates. For example, they reported in succession up the east side of Copper Mountain (2 miles south of Barklow Mountain; see fig. 2) slate, "gabbro" (diorite), and conglomerate with Buchia piochii (Gabb) and on the west slopes of the mountain near the forks of the Elk River, Buchia crassicollis (Keyserling) was found in abundance. To the north, on the southeast extension of Barklow Mountain, they found much the same succession--slates overlain by the

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* Copies kindly made available by the U.S. Geological Survey library, Denver Federal Center, Denver, Colorado. But it is easier to obtain than to read the notes; therefore, in sympathy for any possible subsequent users of them, I include herein several critical quotations, which were won from the documents at great cost of time and eye strain.

same coarse conglomerate containing Buchia. Of the latter locality, Diller wrote:

> "North of the gap slates and sandstones, then conglomerate to top and all along crest to highest point. Collier found robust Aucella [Buchia] on crest....As seen on Copper Mountain, it [conglomerate] must be 500 - 1,000 feet thick. Returning I collected chips of the igneous rock in the gap between Iron and Bray [Barklow] Mountain....it appears to have many small dikes or fingers....Brays Mountain [is] conglomerate with sandstone and slate [and dikes below]....under cliffs at south end of Bray Mountain we found numerous Aucella, apparently large and small." (Diller Notebook, D-35, 1899, p. 61-62) (Statements in brackets added for clarity.)

This locality at the south end of the ridge extension of Barklow Mountain, which was erroneously referred to in the field notes as "Bray Mountain," is very near the unconformity locality discovered in 1965.

Age of metamorphism and plutonism

Diller (1903, p. 2) recognized that the conspicuous metamorphism of the Colebrooke Schist (fig. 1) had pre-dated the "Myrtle Formation," because he found schist fragments in Cretaceous conglomerates. On very dubious grounds, he referred that metamorphism to an age as old as Devonian. But it is clear that he saw no relationship between the Colebrooke Schist and the lower grade "Jurassic slates"! This failure produced a serious fallacy in turn in his age assignment of the dioritic plutons of the old Port Orford quadrangle. Because these plutons, all of which he called "gabbro," penetrated and thermally metamorphosed rocks mapped by him as "Myrtle Formation," the plutonism was inferred to be post-Cretaceous in age (1903, p. 4, columns 1-2). Yet at the same time he noted (p. 4, column 4) that conglomerates of the "Myrtle Formation" contained pebbles of dacite-porphyry like that of dikes apparently closely related to the "gabbro" and to certain "granite type" plutons. On the other hand, he observed that the dacite-porphyry dikes penetrated serpentine, which in turn was considered post-Cretaceous. The obvious dilemma posed by these statements was not adequately treated in the folio, but in field notes there is revealed a nagging uncertainty over the true relative age of the igneous activity. The following quotations are pertinent:

> "[On Blackberry Creek] many pebbles are granitic -- see chip 5276 biotite granite -- while another and large one appears porphyritic -- see 5277, dacite porphyry -- but does not appear to be the rock cutting the serpentine. I did not see any of the

certain gabbro in the conglomerate. I suppose it is younger than the conglomerate although I did not recognize any contact metamorphism." (Diller Notebook D-35, 1899, p. 71.)

"[Northwest of Blackberry Creek] This conglomerate is full of Aucella fossils....The conglomerate is in places very coarse, containing boulders 3 or 4 inches diameter; some of the boulders are schist but most are igneous rock." (Collier Notebook, D-36A, 1899, p. 86.)

"Ascending Bray Mountain [actually Barklow Mountain] come to conglomerate, some having pebbles 4 inches in diameter. One looks like gabbro....number 5437 diorite?" (Diller Notebook, D-36, 1900, p. 53a.)

"The conglomerate of [Mount] Avery as of Butler appears to have much igneous material in it....chips look like the common igneous rock [that is, "gabbro"]. If so, it would seem that [Cretaceous] conglomerate [is] younger than some of igneous." (Diller Notebook, D-36, 1900, p. 76a.)

The relative age enigma persisted into the published folio solely because the slaty rocks intruded widely by the diorite were not differentiated from unmetamorphosed, true "Myrtle" strata. There can be no doubt that at least the vast bulk of diorite pre-dates "Myrtle" deposition, for dioritic clasts, as well as phyllite, slate, and foliated graywacke, are persistent in both Portlandian and Early Cretaceous conglomerates. Indeed, perusal of the field notes reveals that such fragments were found at many more localities than is implied in the folio text. Flaws in the work of J. S. Diller and his associated are few, but the failure to assess properly the "Jurassic slates" and, therefore, also the true age of the diorite plutons was a serious oversight that has gone uncorrected until now.

Reinterpretation of the "Jurassic slates" and the pre-Portlandian unconformity

Galice-Colebrooke-Dothan rocks delineated

Study of Diller's field notes strengthened a growing suspicion that slaty rocks underlie practically all of the eastern portion of the area mapped by Diller as the "Myrtle Formation" on the old Port Orford quadrangle; this portion extends south-southwest from Powers through the Johnson Creek area and for at least 15 miles beyond. Moreover, the field notes suggested that an increasing metamorphic gradient exists from north to south into the large mass of Colebrooke Schist that straddles the Rogue River and extends south

to the Collier Butte area (fig. 1). Reconnaissance along logging roads confirmed the prevalence of slates and foliated sandstones from Lake of the Woods north almost to Powers. Definite Colebrook Schist was mapped by Diller at Lake of the Woods, 3 miles north of Rogue River (10 miles south of Johnson Creek). But only 1 mile north of the lake, in an area mapped as the "Myrtle Formation," Diller reported:

> "The rocks of Brushy Mountain are certainly considerably metamorphosed and the slates are scarcely distinguishable from some of those in the real schists.... There is no conglomerate along the trail along Brushy Mountain, but the sandstone...is abundant.... The sandstone seems to be somewhat squeezed and slaty." (Diller Notebook, D-35, 1899, p. 55).

And south of Blackberry Creek, about 5 miles to the northwest, he reported:

> "I find scattered coarse gabbro, no definite hornfels, but sandstone is somewhat schistose. Approaching the highest point of divide halfway to Panther Mountain the sandstone becomes more fissile, i.e. slaty. The shale becomes slate like that of Brushy Mountain and a fine conglomerate becomes schistose." (Diller Notebook D-35, 1899, p. 69).

Slates were also reported at a number of other scattered localities, notably on Ophir Mountain and on Foster Creek, 2 miles north and 2 miles northeast respectively of Brushy Mountain.

Results of studies by geologists from the University of Wisconsin near the coast seemed to demand that a major angular unconformity exists between Portlandian strata and older Jurassic metamorphic and igneous rocks. Because it could not be clearly demonstrated there, the Collier Butte area was examined (fig. 1). Though the latter area provides somewhat clearer evidence, it was not fully satisfactory. The Copper Mountain-Johnson Creek area farther north seemed to offer the last hope for finding the elusive evidence. In 1960 I had attempted with J. G. Koch to reach Copper Mountain from the west, but lack of time precluded our ascending its critical east slope, where an apparently uninterrupted fossiliferous sequence had been reported. In 1965 I approached from the east by way of new logging roads in the Johnson Creek drainage basin.

The long-sought unconformity was found to be exposed in the upper Johnson Creek drainage, especially on the spur extending west from Granite Peak to the cuesta ridge southeast of the Barklow Mountain fire lookout tower. This is the ridge erroneously termed "Bray Mountain" throughout most of Diller's field notes but not on the published folio maps; this misnaming led to considerable initial confusion in using the notes. The lower east slopes of the cuesta expose dark semi-slates and foliated sandstones

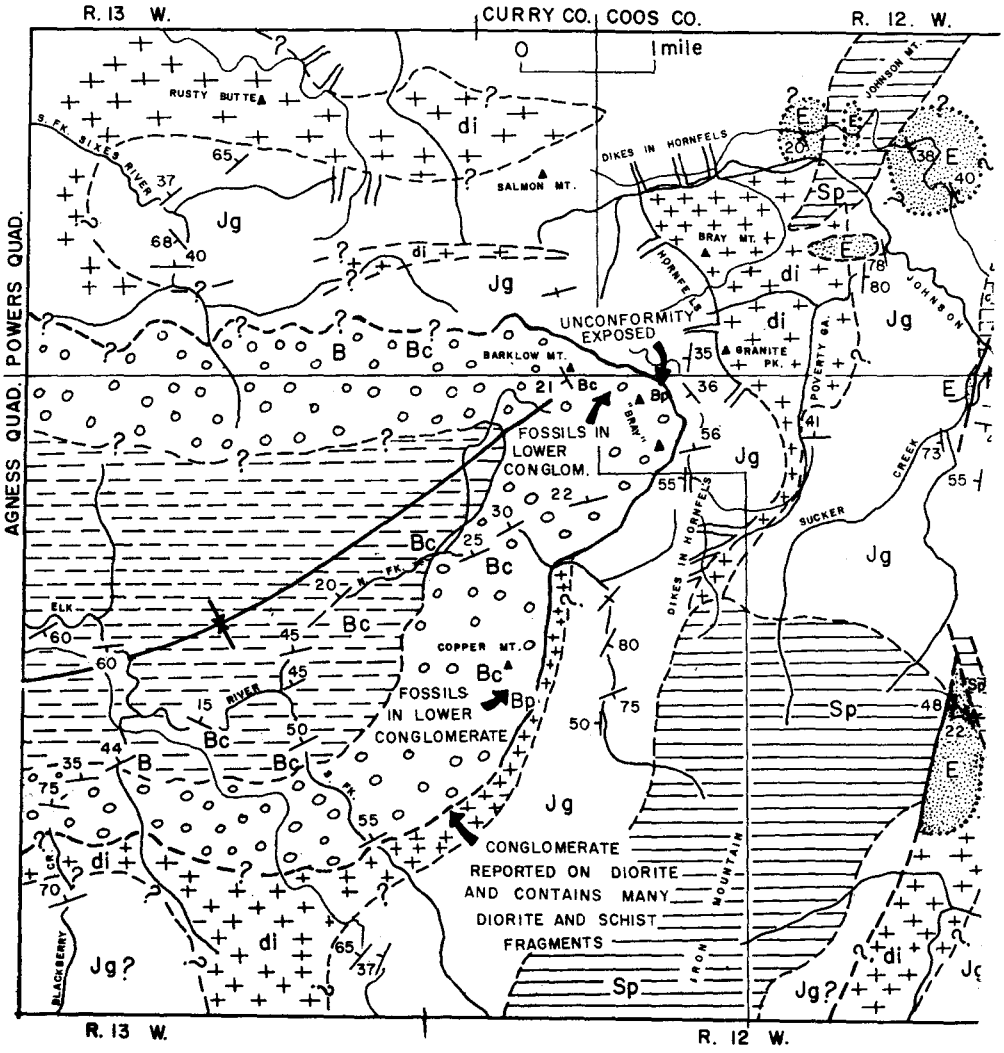
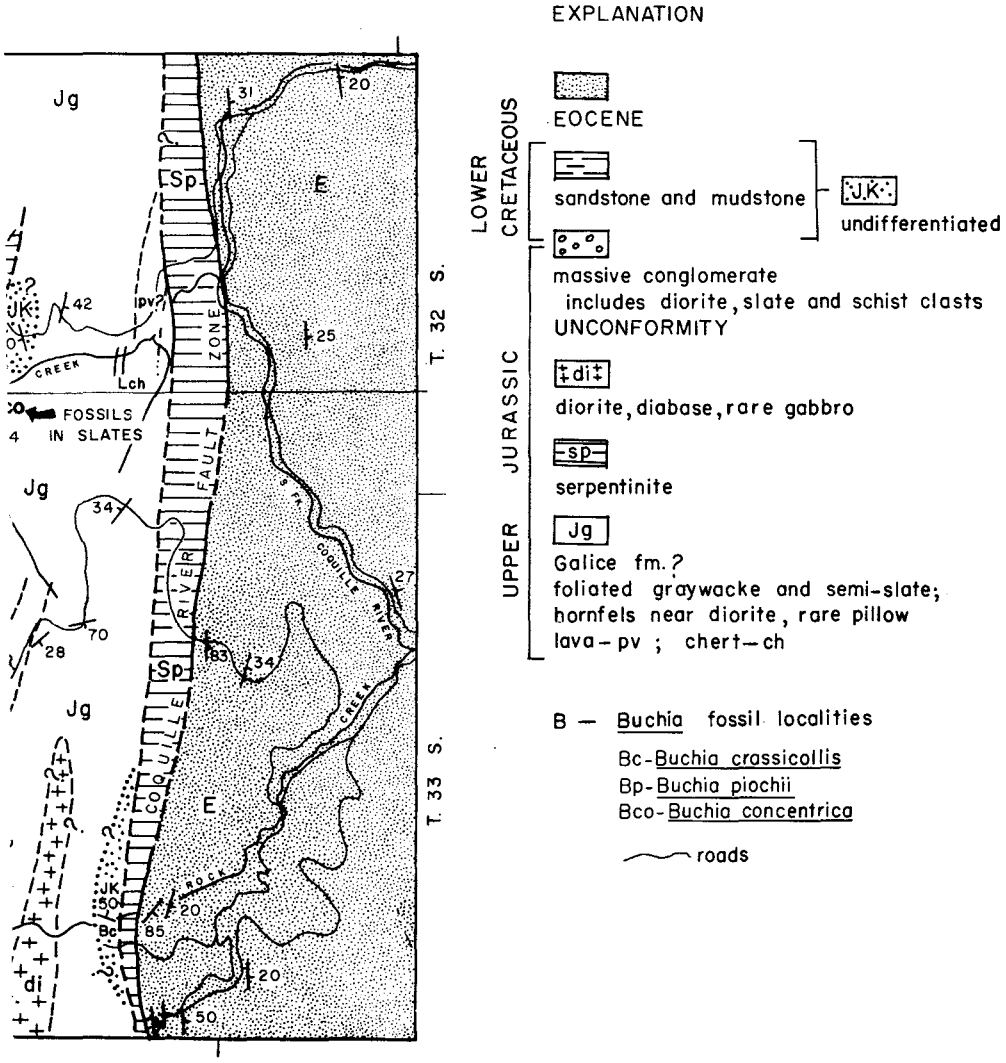


Figure 2. Geologic map of upper Elk River and Johnson Creek are east side of Barklow Mountain and probable extension of igneous bodies to the Galice Formation(?). See Figure



howing location of sub-Portlandian unconformity observed on south-
:onformity westward; note also location of fossils and relationships of
or location of area.

that are intruded by the Bray Mountain-Granite Peak diorite mass (fig. 2). Near the intrusive contacts, prominent hornfels zones occur. The clam Buchia concentrica (Sowerby) was found in identical slaty rocks in lower Sucker Creek (2 miles east) at a locality cited by Diller. This establishes a Jurassic (late Oxfordian to early Kimmeridgian) age (Imlay, written communication, 1965) for the metamorphic rocks, which are here tentatively assigned to the Galice Formation on both lithologic and faunal grounds.

Because of lithologic similarity and apparent lateral continuity, all of the slaty rocks from Johnson Mountain and Johnson Creek south to the true Colebrooke Schist near Rogue River are also considered to represent the Galice Formation (fig. 1). This belt of Galice outcrops clearly defines the "anticlinal arch" that Diller referred to vaguely in the Port Orford folio. The Galice slates might, indeed, be mapped as Colebrooke, but because of their very low metamorphic grade, their faunal content, and general lithology, they are instead here referred to the Galice Formation. These slates are no more metamorphosed than is the type Galice farther east, and they also closely resemble the Galice? metasediments of the Lower Elk River-Pearse Peak area near the coast (Koch, 1966).

A lateral gradation apparently occurs from Galice Formation semi-slates southward to more typical Colebrooke Formation greenschist facies rocks near the Rogue River. In turn, however, the Colebrooke schists also grade southward into essentially unmetamorphosed rocks assigned to the Dothan Formation in the vicinity of Collier Butte (Dott, 1965). Therefore, the Colebrooke Formation appears to include metamorphic equivalents both of the Galice and of the Dothan Formations; clearly, metamorphic grade has a very irregular geographic pattern in southwestern Oregon. The Colebrooke name is here reserved for schists and phyllites whose original character is thoroughly altered and whose original formational affinities are not clear.

Conglomerate sequence above unconformity

Above the Galice metasediments on the cuesta west of Granite Peak are coarse, massive unmetamorphosed conglomerates forming bold outcrops such as Diller described for this same locality (see quotations above for "Bray Mountain"). On a freshly cut log-skinning trail, the conglomerate was found resting discordantly upon eroded slaty rocks. Well-rounded pebbles and cobbles (averaging 2 to 4 inches in diameter; maximum 2 feet) consist of rock types (table 1) that were clearly derived from the older metamorphic and igneous complex. Near the base of the conglomerate a zone of very fine sandstone contains abundant Buchia piochii (Gabb) of Portlandian age (Imlay, written communication, 1965). More coarse pebble and cobble conglomerate occurs above this zone clear to the cuesta summit. At Barklow Mountain lookout half a mile northwest Buchia crassicollis (Keyserling) of Early Cretaceous (Valanginian) age occurs in similar conglomerate and conglomeratic sandstone (fig. 2). The entire sequence appears to be

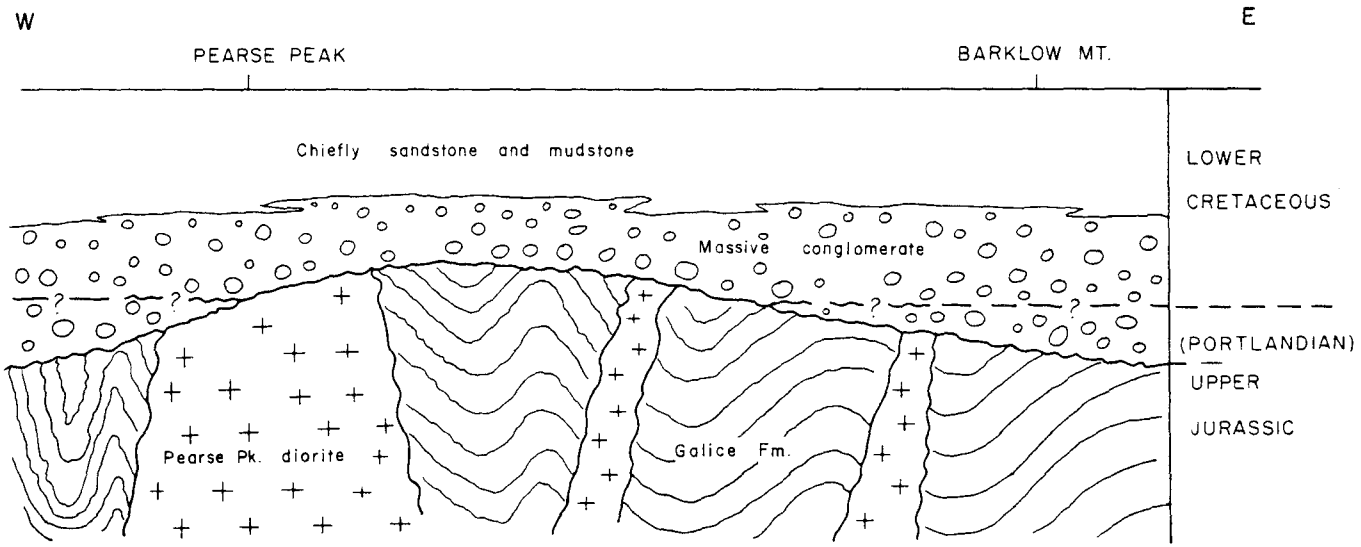


Figure 3. Restored cross section from Humbug Mountain near coast to Johnson Creek (across north end of Figure 1); shows inferred stratigraphic and age relations of the Humbug Mountain Conglomerate to older and younger rocks. Length of line of section is about 20 miles.

Table 1. Composition of conglomerate clasts on cuesta southeast of Barklow Mountain (104 clasts)

	Basal portion	Middle of cuesta face
Volcanic	29 percent	29 percent
Diorite	21	39
Chert	17	21
Foliated sandstone	15	8
Quartz	2	3
Hornfels and phyllite	6	0
Indeterminate	10	0
	100 percent	100 percent

concordant, though some of the middle portion is obscured by dense vegetation.

The coarse, massive Humbug Mountain Conglomerate, named and mapped by Koch near the coast, extends eastward around a large synclinal structure through Copper Mountain to Barklow Mountain, and thence northwestward for nearly 10 miles along the south side of the Sixes River drainage. Apparently it occurs north of the Sixes River, for Diller reported presumably identical conglomerate at Sugarloaf Mountain (7 miles northwest of Barklow Mountain); its possible extent beyond that point is unknown. The basal portion of the conglomerate is unfossiliferous on the lower Elk River, where it unconformably overlaps Galice? metasediments, but Cretaceous fossils occur at higher levels nearby (Koch, 1966). Between Barklow Mountain and Humbug Mountain the conglomerate appears to be much thinner and to contain only Cretaceous fossils. These data suggest that Diller was correct in interpreting the Portlandian and Cretaceous strata as having "overlapped in a way to suggest deposition in a sea having islands" (1903, p. 2, col. 4).

Figure 3 shows a restored interpretation of the relations of the Humbug Mountain Conglomerate to other rocks. In such a monotonous and massive conglomerate it is impossible to know if a minor unconformity, such as Koch postulated (1966), does exist between Portlandian and Cretaceous strata. Near more topographically positive areas one may indeed have formed, but it appears that in at least some areas essentially continuous gravel deposition occurred. Moreover, it is entirely possible that farther from the island gravel sources, thick mudstone and sandstone sequences typical of the Portlandian Otter Point Formation (Koch, 1966) accumulated. Thus the nearby Otter Point (fig. 1) appears to be in part a temporal (that is, lateral lithofacies) equivalent of the lower Humbug Mountain Conglomerate. But

if large-scale faulting has occurred, the two may originally have been deposited rather far apart. In either case, the paleogeography and sedimentology of southwestern Oregon at the end of Jurassic time was extremely complex.

Conclusions

It is clear that Diller combined two very different sedimentary sequencies that are in fact separated by a major angular unconformity representing the classic Nevadan orogeny. The unconformity is well exposed in the Barklow Mountain area where unmetamorphosed Late Jurassic conglomerates overlie Galice slates intruded by diorite. The "Jurassic slates" of Diller are far more extensive than was indicated in the Port Orford folio, and they appear to be completely gradational to the more intensely metamorphosed Colebrooke Formation. The Humbug Mountain Conglomerate, originally considered to be entirely of Early Cretaceous age, is now found to contain Late Jurassic (Portlandian) fossils in the Barklow Mountain area. Although a minor unconformity may exist within it, the conglomerate appears to represent continuous deposition of gravels here.

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GOVERNOR HATFIELD SALUTES 50TH ANNIVERSARY OF AAPG

Governor Mark O Hatfield holds an ornamental paper weight fashioned from a drilling core of 230,000,000-year-old Permian limestone presented to him on March 23 during a special ceremony recognizing the 50th anniversary of the American Association of Petroleum Geologists. Participating in the presentation are (from left to right): Dr. W. D. Wilkinson, Chairman, Department of Geology, Oregon State University; Governor Hatfield; Dr. Keith F. Oles, Department of Geology, Oregon State University; and Hollis M. Dole, State Geologist.

The American Association of Petroleum Geologists is the world's largest geological organization. It has some 15,000 members in the United States, Çanada, and 73 foreign countries. Headquarters are in Tulsa, Okla. Objectives of the association are to advance the science of geology, especially as it relates to petroleum and natural gas and to encourage improvements in the methods of exploring for and use of these resources.

Dr. Wilkinson pointed out that the majority of graduates of the Oregon State University Department of Geology are recruited for employment by the oil industry. OSU now has about 100 undergraduate majors in geology and 30 students working for master's and doctor's degrees.

Governor Hatfield took note of contributions made by oil geologists in national and world development and of the potential for oil deposits off the Oregon coast. Drilling operations were started off shore a year ago and will be continued this year by oil companies.

In closing his official proclamation, Governor Hatfield said, "I would urge all our citizens to recognize the important part the petroleum geologist has played in the past 50 years of our nation's progress and join me in saluting the profession."

PROFESSIONAL GEOLOGISTS FORM OREGON SECTION

The American Institute of Professional Geologists is in the process of forming an Oregon Section. The present membership is 16, with several additional applications pending.

The Institute was founded on November 15, 1963, and was incorporated under the laws of the State of Colorado. As of January 1, 1966, there were 1,093 members. These members are found in all of the 50 states and in 12 foreign countries. Among the many purposes of the Institute, several are particularly noteworthy. These include:

1. To encourage higher professional and scientific standards by its members for the protection of the health, welfare, and economy of the public, and to aid in the public dissemination of knowledge of non-professional practice of geology.

2. To enforce the Code of Ethics of the Institute and to report infractions by members to the Executive Committee of the Institute.

Geologists interested in membership in the AIPG or in further information may contact the State Coordinator, Dr. Keith F. Oles, at the Department of Geology, Oregon State University, or either of the Associate Coordinators: Herbert G. Schlicker, State Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon 97201 or Dr. Ewart M. Baldwin, Department of Geology, University of Oregon, Eugene, Oregon.

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BULLETIN 58 ISSUED BY DEPARTMENT

"Geology of the Suplee-Izee Area, Crook, Grant, and Harney Counties, Oregon," has been published by the Department as Bulletin 58. The authors are William R. Dickinson, Geology Department, Stanford University, California, and Laurence W. Vigrass, Western Resources Consultants Ltd., Calgary, Alberta.

The Suplee-Izee area, which occupies about 500 square miles in east-central Oregon, is geologically one of the most interesting regions of the State. It consists of an inlier, sometimes called a "window," of fossiliferous Paleozoic and Mesozoic strata, largely of marine origin, surrounded by Tertiary volcanics. The geology is complex, but, since metamorphism and intrusion were minimal in this area, the original character of the strata, the details of deformation, and the fossil sequence have been preserved.

Drs. Dickinson and Vigrass, who chose the Suplee-Izee area for their doctoral dissertations, have presented in this joint report the most complete and definitive work to date on the stratigraphy and structure of this pre-Tertiary inlier.

The illustrated publication has 110 pages. It contains check lists of fossils, descriptions of measured sections, and a glossary of technical terms.

The multicolored geologic map accompanying the bulletin shows 32 geologic units and represents the finest color work ever achieved in a Department publication. Bulletin 58 may be obtained from the Department's offices in Portland, Baker, and Grants Pass. The price is $5.00.

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RESEARCH CENTER HEAD NAMED

H. Gordon Poole has been appointed head of the U.S. Bureau of Mines Albany Metallurgy Research Center. Haruo Kato, project coordinator of the physical metallurgy laboratory, has been acting head of the Research Center since the first of the year. Poole comes to the Bureau with a long background in metallurgical engineering dating back to 1931. He leaves the position of vice president and technical director of the Oregon Metallurgical Corp. at Albany to accept the new assignment.

Also stationed at the Bureau's Albany offices and laboratories are: Mark L. Wright, Area VII Minerals Resources officer; A. J. Kauffman, Jr., Head, Albany Office of Mineral Resources; Joseph W. Town, Head, Mineral Resources Services; and Harlan Jager, Administrative Officer for the Albany Station.

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CANYON CITY REGION MAPPED

"Geologic map of the Canyon City quadrangle, northeastern Oregon" by C. E. Brown and T. P. Thayer has been published as Misc. Geol. Invest. Map I-447 by the U.S. Geological Survey. This is the fourth in a series of Oregon geologic maps to be issued at this scale (1 inch equals approximately 4 miles) on AMS sheets, preparatory to publication of the eastern half of the State Geologic Map. The report covers a large region in the central Blue Mountains from Sumpter and Unity on the east to Paulina and Picture Gorge on the west. The pre-Tertiary inlier of central Oregon occupies part of the map. Rocks range in age from Devonian to Recent, and comprise 45 geologic units shown on the map by color and pattern.

Copies may be obtained from the U.S. Geological Survey, Federal Center, Denver, Colo. 80225. The price is $1.00.

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NEW WILDCAT UNDER WAY IN NORTHWEST OREGON

A shallow test drilling (permit 55) is being conducted by Butte Oil of Oregon, Inc., approximately 1 mile southeast of Forest Grove. The well is situated on the Russell A. Cowan property in the NW¼ sec. 8, T. 1 S., R. 3 W., Washington County. Projected depth is 1,000 feet and the goal is the testing of Oligocene marine sediments below the Columbia River Basalt.

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