3. SITE 100 – CAT GAP

The Shipboard Scientific Party[1]

INTRODUCTION

Site 100 is located at 24° 41.27'N, 73° 47.98'W in a water depth of 3525 meters. Seismic profiling and piston coring had shown that the Cat Gap area offered a good opportunity to penetrate old sediments with relative ease (Ewing *et al.*, 1966; Windisch *et al.*, 1968; Habib, 1968). Because of personnel injuries, Leg 1 drilling at this location was terminated before basement could be reached–in Valanginian-Tithonian deposits at a subbottom depth of only 259 meters (Ewing *et al.*, 1969). The principal goal for Site 100 was, therefore, to complete the stratigraphic section in the Cat Gap area, sample the oldest sediment, and determine the nature of Horizon B.

Seismic profiling and drilling during Leg 1 indicated that Horizon B would be easiest to reach at a position about 30 miles north of Site 4. The position selected for the hole (Figure 1) was a few miles west of a small ridge, where the total amount of sediment above Horizon B, as recorded by the seismic profiler, corresponds to 0.3 second reflection time (Figures 2a and 2b).

An obvious, but not strong, reflector overlies Horizon B by approximately 0.08 second. According to previous surveys in the area (Windisch *et al.*, 1968) most of the sediment between the sea floor and Horizon B is included in the zone of reflectors called Horizon Beta. This horizon has been traced over a considerable part of the North America Basin, particularly the southwestern region, and its age and lithology had not been satisfactorily established by the Leg 1 drilling.

Continuity of horizons observed in the profiler records between Sites 99 and 100 is uncertain, partly because of a major fault zone approximately half way between the two sites, but the deepest reflectors (Horizon B) at both places have definite similarities. The late Jurassic limestone drilled at Hole 99A marks a major lithologic change from the overlying Neocomian to Tithonian cherty limestone, and, after the completion of the drilling, there seemed to be a good likelihood that Reflector B corresponds to the top of the limestone sequence. However, the profiler records also show a moderately strong reflector 50 to 100 meters above B, which also might be correlated with the top of the late Jurassic limestone. There was good reason to expect that if a deep section could be obtained at Site 100, a stratigraphic connection with Hole 99A might be made to clarify the seismic picture, and thus provide a means of extrapolating the geological results over a broad region.

OPERATIONS

Positioning

The ship arrived at the site at 0600 hours on April 20, 1970, conducted a short survey to verify the anticipated sediment thickness, and dropped the beacon at 1430 hours. Apparently the ship was set toward the east more than expected, and by the time the beacon had been launched, it had drifted closer than planned to the small basement(?) ridge. However, as shown by the profiler record (Figure 2a) made on a west-east traverse over the beacon after completion of drilling, the hole appears to have been drilled far enough from the ridge so that the results can probably be considered to represent basin stratigraphy rather than ridge flank stratigraphy.

The beacon amplitude began to vary approximately twenty per cent after four days and seventeen hours of operations. The positioning system continued to operate in automatic by increasing the gains.

Drilling

The hole was drilled with a Smith 4-cone tungsten carbide button bit. The bit, the core barrel, and the lowermost four drill collars were lost on the trip out of the hole, and an inspection of the bit was therefore not possible.

Spudding-in was accomplished without difficulties at 2300 hours, April 20. The hole was washed to approximately 30 meters before rotation was necessary to obtain penetration.

The hole was drilled to a depth of 200 meters before the first sample was taken. Drilling during this interval was relatively easy, except between 120 and 130 meters subbottom depth.

A thin, hard layer was penetrated slightly above Core 1. The first core was composed mainly of chalk and contained some chert. Drilling was resumed in material of approximately the same consistency to a depth of 237 meters, where penetration became much more

[1]Charles D. Hollister, John I. Ewing, Daniel Habib, John C. Hathaway, Yves Lancelot, Hanspeter Luterbacher, Fred J. Paulus, C. Wylie Poag, James A. Wilcoxon, Paula Worstell.

difficult. Core 2 was taken at this level and recovered 3.6 meters of hard, late Jurassic limestone. Both from the drilling record, which is shown in Figure 3 (alternating periods of slow and fast penetration), and from the ratio of core recovery to cored interval, it was judged that the strata consist of hard limestone layers separated by much softer beds that were washed out by the drilling fluid. This material was drilled and cored to a subbottom depth of 317 meters, at which point Core 10 recovered 20 centimeters of basalt underlying a greenish-gray argillaceous limestone.

Coring was continued into the basalt for 14 meters; 4.5 meters of basalt were recovered. The basalt contains a few inclusions of limestone. The average penetration rate in the basalt was 2 m/hr.

Comparison of the core samples and the drilling record with the seismic data indicates that the top of the basalt sequence corresponds with Horizon B, and the top of the overlying sequence of the late Jurassic variegated limestone with the much less prominent reflector in Figure 2a. This latter reflector was traced during the traverse to Site 101 and becomes much stronger towards the north.

The ship departed from location on April 24, at 1130 hours.

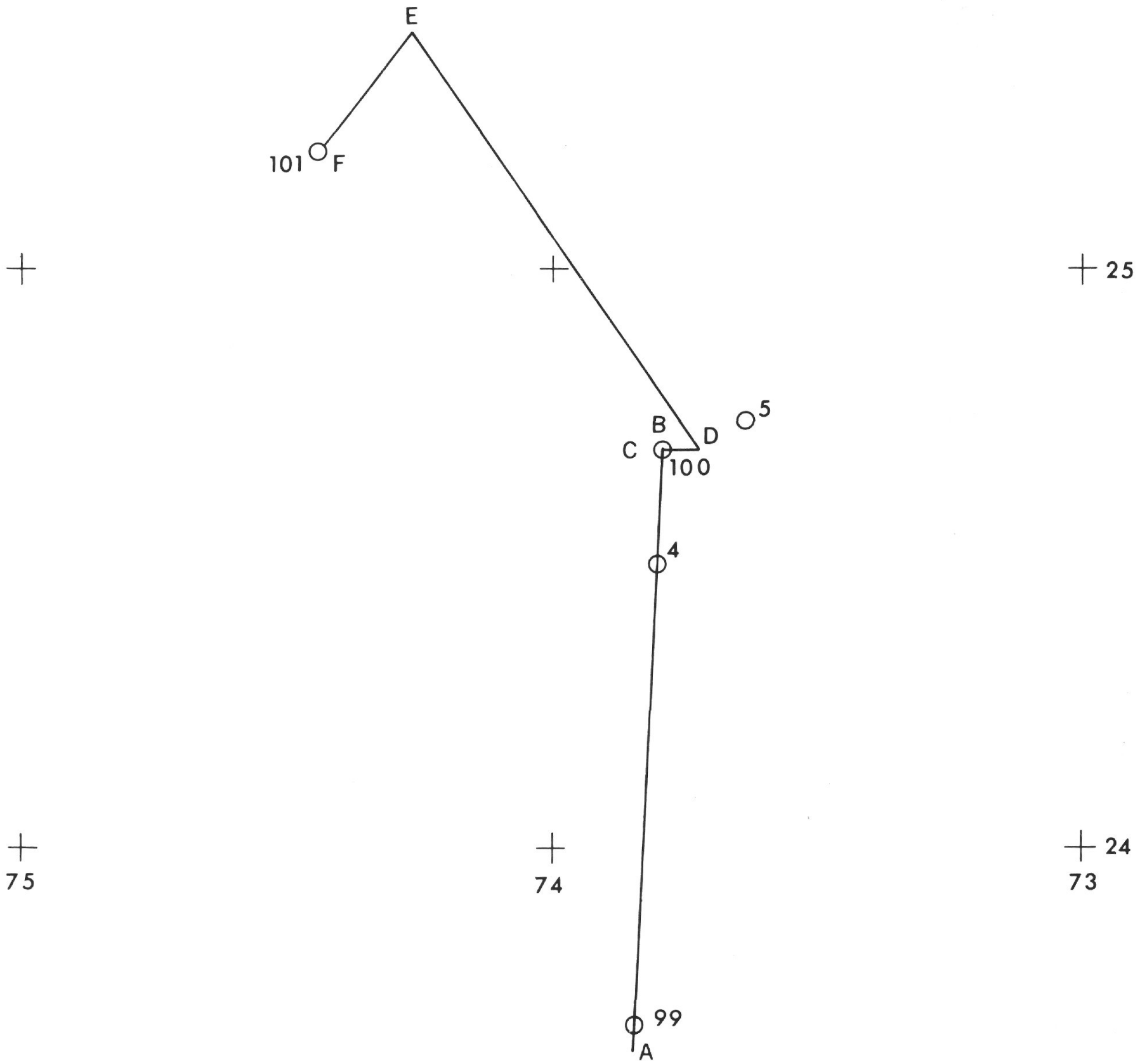


Figure 1. *Seismic profiler tracks between Sites 99, 100 and 101 (Cat Gap area).*

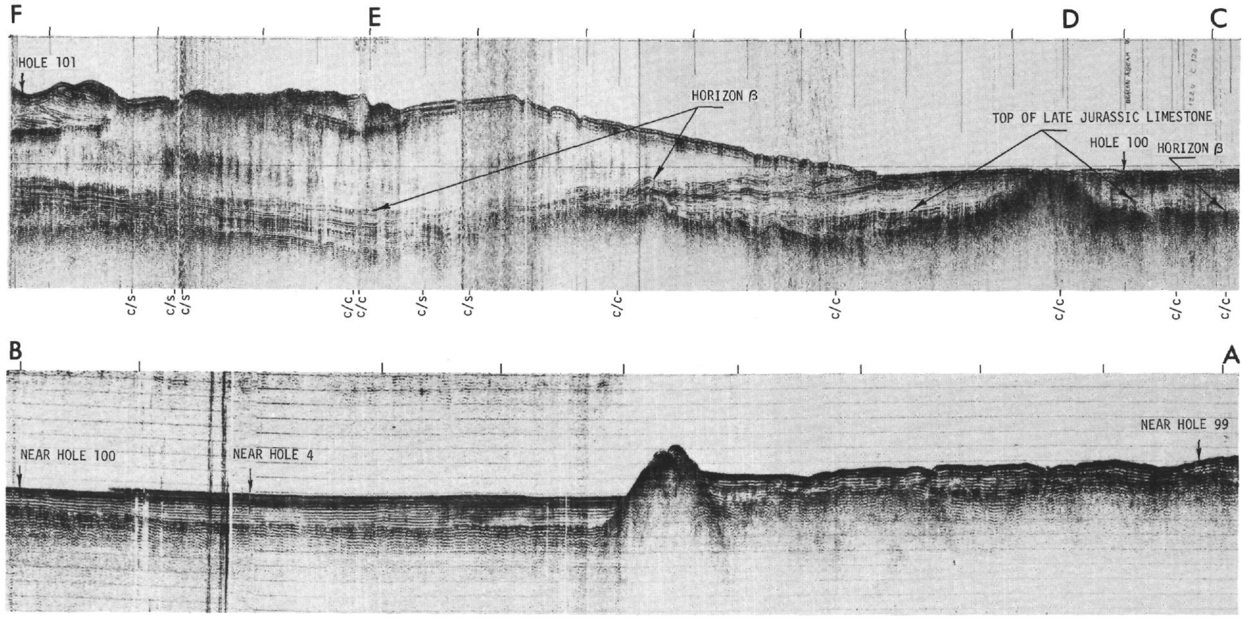


Figure 2a. *Profiler record AB (R/V* CHAIN*) between Sites 99 and 100; record CDE* (GLOMAR CHALLENGER) *between Sites 100 and 101. See Figure 1 for track locations.*

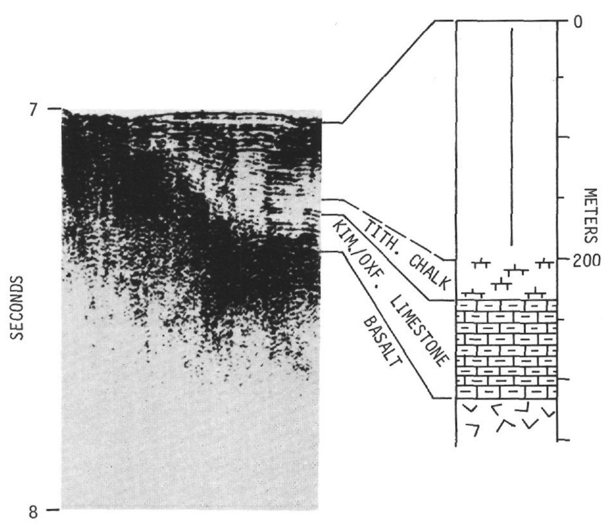


Figure 2b. *Seismic stratigraphy and lithology at Site 100.*

STRATIGRAPHY

Biostratigraphy

Drilling of Holes 4 and 4A during Leg 1 had penetrated 259 meters of sediments and established the presence of Pliocene, Campanian, early Senonian to late Turonian, early Cenomanian, late Albian, Hauterivian, and Valanginian to Tithonian deposits. The first core at Site 100 was therefore cut at a subbottom depth of 203 meters. The lithology and fossil content of Core 1 correspond fairly well to Core 5 taken at Site 4 of Leg 1.

The core catcher of Core 1 contains only a few well-preserved specimens of dinoflagellates. These include *Diacanthum hollisteri*, new genus, new species, which was not observed above Core 22 at Site 105; and *Ctenidodinium elegantulum*, which has been described from the Lower Cretaceous of France.

The calcareous nannoplankton assemblage indicates a Valanginian to late Tithonian age (*Nannoconus steinmanni, N. dolomiticus, N. kamptneri, Parhabdolitus embergeri*, and others). Several species common to both stages are present in the core catcher and at this time it is very difficult to distinguish between the two stages.

Section 5 of Core 1 contains very rare isolated loricae of calpionellids (*Remaniella* sp. aff. *R. cadischiana, Calpionellopsis* sp. aff. *C. oblonga, C.* sp. aff. *C. simplex, Calpionella* sp. aff. *C. alpina*, and *Tintinnopsella* sp. aff. *T. carpathica*). This association indicates a Berriasian to latest Tithonian age.

The poor foraminiferal assemblages consist of simply structured arenaceous forms and a few lagenids. Radiolarians and ostracodes are rare to common in the washed residues.

Core 100-2 contains calcareous nannoplankton of a definite late Jurassic aspect (*Watznaueria britannica,* *Hexapodorhabdus cuvillieri, Zygodiscus salillum, Diazomatolithus lehmanni,* and others).

A sample from the core catcher processed for palynomorphs is devoid of dinoflagellates.

The washed residue obtained from the core catcher of Core 2 contains only rare and poorly preserved radiolarians and very rare fragments of the pelagic crinoid genus *Saccocoma.*

Recovery of Core 3 (246 to 259 meters below bottom) was very poor. Only 30 centimeters of a slightly argillaceous, cherty limestone in Section 1 and the core catcher were retrieved. The core catcher contains the dinoflagellate species *Chytroeisphaeridia pococki,* which indicates a late Jurassic age. The calcareous nannoplankton (*Stephanolithion bigoti, Hexapodorhabdus cuvillieri, Zygodiscus erectus, Watznaueria britannica* and *W. barnesae*) comprise mainly species which are hitherto known from the Oxfordian, but the tops of the ranges of these species are still poorly known.

The washed residues contain only a few radiolarians and sponge spicules.

Only one section and the core catcher were obtained from Core 4, whereas Core 5 is represented by 1.9 meters of sediment. The core catcher of Core 4 and Sample 100-5-2, 25 to 27 centimeters, contain a well-preserved assemblage of dinoflagellates, including *Chytroeisphaeridia pococki, Gonyaulacysta ambigua* and *G. nuciformis.* These species suggest an early Kimmeridgian or Oxfordian age and can be found in Association H (Cores 35 to 37) at Site 105.

The calcareous nannoplankton assemblages of Cores 4 and 5 are all very rare and poorly preserved. Radiolarians are present in variable amounts. The foraminiferal assemblages consist mainly of simply-structured arenaceous forms, *Spirillina*, and a few lagenids. The remains of pelagic crinoids (*Saccocoma* sp. cf. *S. quenstedti, S.* sp. cf. *S. schattenbergi*) point toward a late Oxfordian to Kimmeridgian age.

The two samples processed from Core 6 for palynomorphs (100-6-1, 63 to 65 centimeters, and core catcher) are barren of dinoflagellates.

Hexapodorhabdus cuvillieri, Zygodiscus salillum, Palaeopontosphaera dubia, Diazomatolithus lehmani, Watznaueria britannica, and *Podorhabdus perforatus* are the most conspicuous species in the calcareous nannoplankton assemblages.

The foraminiferal faunas are still rather poor and badly preserved, but the number of specimens and species is greater as compared to the overlying cores, whereas the number of radiolarians is smaller. The assemblages are dominated by simply-structured forms (*Spirillina tenuissima, S. elongata, S. orbicula, Turrispirillina amoena, Ramulina spandeli,* and others), but a few lagenids are also present (for example, *Lenticulina quenstedti, Frondicularia lingulaeformis, Lingulina umbra*). The genus *Saccocoma* is represented by a few broken skeletal elements.

Cores 7 and 8 contain numerous well-preserved cysts of dinoflagellates. The assemblages are the oldest ones recovered during Leg 11. Stratigraphically important species include *Meiourogonyaulax valensii, Pareodinia ceratophora, Gonyaulacysta nuciformis, G. scarburghensis, G. ambigua, Scriniodinium* (*Endoscrinium*) *galeritum, Chytroeisphaeridia chytroeides, Ch. pococki,* and *Tenua verrucosa.* These species range throughout Cores 7 to 10. They indicate an Oxfordian age. *Meiourogonyaulax valensii* is reported for the first time from sediments younger than the middle Jurassic (Bathonian).

The calcareous nannoplankton assemblages are very similar to those of the overlying cores, although a slight shift in species composition is apparent beginning with Core 8.

The foraminiferal assemblages of Cores 7 and 8 are, in places, fairly rich and diversified, but their preservation is generally poor. Besides representatives of *Spirillina* and simply-structured arenaceous foraminifera, a considerable number of lagenids was observed. Radiolarians and *Saccocoma* occur only scattered and in very small numbers. Ostracodes are common (*Pontocyprella* sp., *Acrocythere* ? sp., *Acratia* sp., *Polycope* spp., *Bairdia* (*Akidobairdia*) *farinacciae*, and others).

The dinoflagellate assemblages of Core 10 contains the following species in addition to those already recorded from Cores 7, 8 and 9: *Gonyaulacysta dangeardi, Tenua villersense, Scriniodinium luridum* aff. *Eisenackia* sp., *Stephanelytron* ? sp. A, and *Dictyopysis reticulata.* The admixture of Callovian and Oxfordian species, as well as Bathonian forms (for example, *Dictyopysis reticulata* and *Meiourogonyaulax valensii*), suggests that this core may be Oxfordian or Callovian in age.

The calcareous nannoplankton from Cores 9 and 10 closely resemble those of Core 8. *Zygodiscus salillum, Z. bussoni, Ethmorhabdus gallicus, Palaeopontosphaera dubia, Parhabdolithus liasicus, Loxolithus armilla* and *Watznaueria britannica* are among the most obvious species. A differentiation of the mid-Jurassic stages immediately below the Oxfordian is not possible with calcareous nannoplankton at this time. Cores 8 to 11 are therefore dated as Oxfordian to Callovian based on calcareous nannoplankton.

Spirillina tenuissima, S. orbicula, Rhizammina sp., *Tolypammina* sp., *Reophax helveticus, R. multilocularis, Bigenerina arcuata, B. jurassica, Dentalina jurensis, D. laevigata,* and *Lenticulina* spp. *ex gr. L. muensteri* are the dominant species in the foraminiferal assemblages of Cores 9 and 10. Noteworthy is the presence of such species as *Trocholina transversarii, Marssonella doneziana* and *Lenticulina polonica.* The lowermost samples from Core 10 are largely composed of adherent arenaceous foraminifera. The question of whether the lowermost cores at Site 100 are Callovian or still Oxfordian in age cannot be decided on the basis of the foraminiferal faunas. An increase in species diversity toward the contact with basalt indicates a gradual shallowing, but water depth was probably never less than bathyal.

The composition of the ostracod assemblages in Cores 9 and 10 is the same as in the overlying interval.

The numerous calcite-filled cracks and inclusions of hard micritic limestone in the basalt from the core catcher of Core 10 and of Core 11 contain the same species of calcareous nannoplankton as Cores 9 and 10. Only fragmented specimens of coccoliths were observed in the limestone layers interbedded in the basalt of Cores 12 and 13.

Lithology

Coring was begun after drilling 203 meters, and the first sediments recovered are dated Valanginian-Tithonian. After this first core, twenty-five meters were drilled, then coring was almost continuous except for a short interruption in the Callovian ? - Oxfordian sediments between 292 and 302 meters. Basaltic rocks were encountered at a subbottom depth of 317 meters. All the overlying sediments are predominantly calcareous.

Tithonian-Neocomian Carbonate Ooze (Core 1)

Core 1 consists of a white, soft to slightly indurated, nannoplankton ooze, with occasional hard gray chert layers. No sedimentary structures were observed. Coarse fragments of calcisiltite and pebbles of chert occur at the top of the core; these probably are contaminants from upper parts of the hole. Sediment composition shows a large predominance of coccolithid forms over common to abundant nannoconids. Small, recrystallized calcite fragments are rare in the soft zones; they are common to abundant in the indurated ones. Some greenish-gray layers contain rare organic matter. Chert fragments show replacement of radiolarians and nannofossils by quartz.

Cuttings from the drill bit that were recovered between Cores 1 and 2 consist of small fragments of quartzose chert and white chalk with some chalcedony spherules.

Red, Clayey Oxfordian-Kimmeridgian Limestones (Cores 2-6)

Hard, clayey limestones, showing alternating red and green beds were cored from 237 to 276 meters below bottom. The upper part of this unit (Cores 2, 3 and 4) is laminated and shows flow structures, current bedding, minor slump structures, and some burrowing. Abundant white clasts are present; these are lithified, small mud pebbles made up of pelagic material. Chert layers and cherty zones are observed to be common in the upper part of the section (Cores 2 and 3).

The red layers consist of a muddy limestone with abundant clay minerals, some coccoliths, and abundant, recrystallized calcite particles. The red color is due to the presence of hematite (staining associated with the clay minerals and some tiny hematite crystals).

The intercalated green layers appear less clayey and contain very abundant recrystallized calcite with rare to common coccoliths.

From Core 4 to basement most of the recrystallized calcite particles are "spindle-shaped" (narrow, fusiform grains).

Cores 5 and 6 appear to have sampled a transition zone between the highly laminated red and green limestone and the more homogeneous greenish-gray Callovian? - Oxfordian limestone. Their composition is almost similar to that of Cores 2 through 4, but the green, faintly laminated layers become predominant and evidence of current action is much less apparent.

Greenish Gray Callovian (?)- Oxfordian Limestone

All of this lower section appears rather homogeneous with the exception of the upper part of Core 7, where laminations and some current bedding are present. The homogeneous limestones consist mostly of greenish-gray calcilutite with some silty zones (calcisiltite). Laminations are usually faint or absent; burrowing is common. Dark gray specks and some large streaks, which appear to have an organic origin, are abundant throughout the interval. They consist mainly of plant debris (twigs and leaves). The inner parts of these concentrations have been replaced by pyrite coated by a thin film of carbonaceous matter.

Microscopic examination of the limestone shows very abundant "spindle-shaped" recrystallized calcite grains, some rare coccoliths and clay minerals, and hematite.

Cores 9 and 10 are slightly more laminated than the overlying sediments of this interval.

Basement (Lower Part of Core 10, Cores 11 and 12)

The top of the basalt lies in the lower part of Core 10. The contact with the overlying sediments is very sharp, and no transition zone (baked sediments, pyroclasts, etc.) is observed; the top 2-centimeter layer of basalt appears very glassy. Most of the basalt is rather massive and has some thin, calcite-filled cracks, but some zones show many thin (approximately 1 millimeter) veinlets of black, glassy material and curved, lamellar structures that are characteristic of pillow lavas.

Several limestone inclusions were observed. These are made almost exclusively of finely crystallized (micritic) calcite. One of these inclusions yielded microfloras of middle to late Jurassic age.

Thin sections of the basalt reveal numerous labradorite laths and a few olivine crystals in a pale brown glass with some magnetite. This indicates a hyalophitic structure. No pyroxene was observed.

RATE OF SEDIMENT ACCUMULATION

A compilation of the rate of sediment accumulation at Site 100 depends on several assumptions caused by the very few, and in part contradictory, geochronological data available for the late Jurassic (for discussion see, for example, Gygi and McDowell, 1970) and the somewhat inexact dating of the interval cored at Site 100.

If the duration of the late Jurassic is taken as 15 million years, and if it is assumed that Core 1 is close to the Cretaceous-Jurassic boundary (135 million years) and Core 10 is near the beginning of the middle Jurassic (150 million years), an average rate of sediment accumulation of $0.75/10^3$ yr. results for the Upper Jurassic cored at Site 100. This is nearly identical to the rate recorded during a similar time interval in Hole 99 (0.6 cm/10^3 yr.).

DISCUSSION AND CONCLUSIONS

The regional aspects of Site 100 will be discussed in the chapter dealing with the geological setting of the Cat Gap area in the third part of this volume.

The seismic profiler record in Figure 2a (upper) was made as *Glomar Challenger* passed over the beacon after drilling Hole 100. The course was approximately east during the pass over the beacon and was changed to northwest after reaching the crest of the basement ridge. At the drilling site, Horizon B appears at 0.30 second below bottom; a weaker reflector appears at about 1.23 second. The latter reflector becomes much more distinct in the track north of the drilling site.

Inasmuch as the primary objective here was to sample the deeper part of the section, no cores were taken until 200 meters had been drilled. Thus, the first sample came from the rather homogeneous material between the reflector at 0.23 second and the highly stratified zone near the sea floor. This sample contained cherty carbonate ooze of Valanginian-Tithonian age. The hole was then drilled to a depth of 235 meters, where a distinct drilling break occurred (Figure 3). Core 2, taken just beneath the break, contained moderately hard limestone of late Jurassic age. The most reasonable assumption seems to be that the reflector at 0.23 second below bottom corresponds to the top of the limestone sequence. Accepting this assumption, we calculate an interval velocity of 2.05 km/sec for the upper 230 meters of section at this site. Assuming further that the basalt encountered at 315 meters produces reflector B, we calculate an interval velocity of 2.30 km/sec for the limestone sequence.

Close examination of the profiler record suggests some layering beneath Horizon B, yet this appearance of layering may be due only to the complex nature of the air-gun pulse. In an attempt to establish whether the apparent layering represents alternating layers of basalt and sediment, we drilled the basalt for a considerable amount of time. From the ratio of apparent penetration to basalt recovered (about 14:4), we judged at the time that there was a good possibility that the drill had penetrated two or three soft layers interbedded with the basalt, even though there was nothing in the recovered samples to indicate this. Further consideration has led us to the belief that the zones of apparently rapid penetration were actually the consequence of closing bumper subs which telescoped only when extra weight was put on the bit for drilling the basalt. Hence, penetration into the basalt may have been only about 4 meters; unfortunately this is not enough for a decisive test of whether the basalt is as layered as the profiler records suggest.

The basaltic rock found below the late to middle (?) Jurassic limestone could have been produced either by a Jurassic basalt flow or by a sill in the Jurassic sediments. The presence of a thin, glassy surface at the top of the basalt, as well as the absence of any type of "baked" or reworked sediments in the overlying limestone, suggests deposition of the first sediments on an already cooled surface.

The basalt contains inclusions of limestone with the same nannofossils as the immediately overlying sediments.

The 40 meters of greenish-gray argillaceous limestone immediately above the basalt contain assemblages of dinoflagellates and calcareous nannoplankton which are different from those of the overlying reddish limestone, and point to an Oxfordian to Callovian(?) age. This limestone therefore represents the oldest sediments which have hitherto been recovered from the ocean floor in the western North Atlantic.

The foraminiferal and ostracod faunas indicate a trend to shallowing towards the base of the section, although water depth was probably never shallower than bathyal.

The approximately 50 meters of late Jurassic reddish limestone and calcareous mudstone contain numerous flow structures and clasts which indicate deposition in an active environment.

The nannoplankton ooze of Valanginian to Tithonian age can be attributed to a deep-bathyal environment.

The nature of the sediments and the microfaunas provides evidence for a gradually deepening depositional environment from middle (?) Jurassic to early Cretaceous time.

REFERENCES

Ewing, J., Worzel, J. L., Ewing, M. and Windisch, C., 1966. Ages of Horizon A and the oldest Atlantic sediments. *Science.* **154** (3753), 1125.

Ewing, M. *et al.,* 1969. *Initial Reports of the Deep Sea Drilling Project, Volume I.* Washington (U. S. Government Printing Office).

Gygi, R. A. and McDowell, F. W., 1970. Potassium-Argon ages of glauconites from a biochronologically dated Upper Jurassic sequence of northern Switzerland. *Eclogae Geol. Helvetiae.* **63** 1, 111.

Habib, D., 1968. Spores, pollen, and microplankton from the Horizon Beta outcrop. *Science.* **162**, 1480.

Windisch, C. C., Leyden, R. J., Worzel, J. L., Saito, T. and Ewing, J., 1968. Investigation of Horizon Beta. *Science.* **162**, 1473.

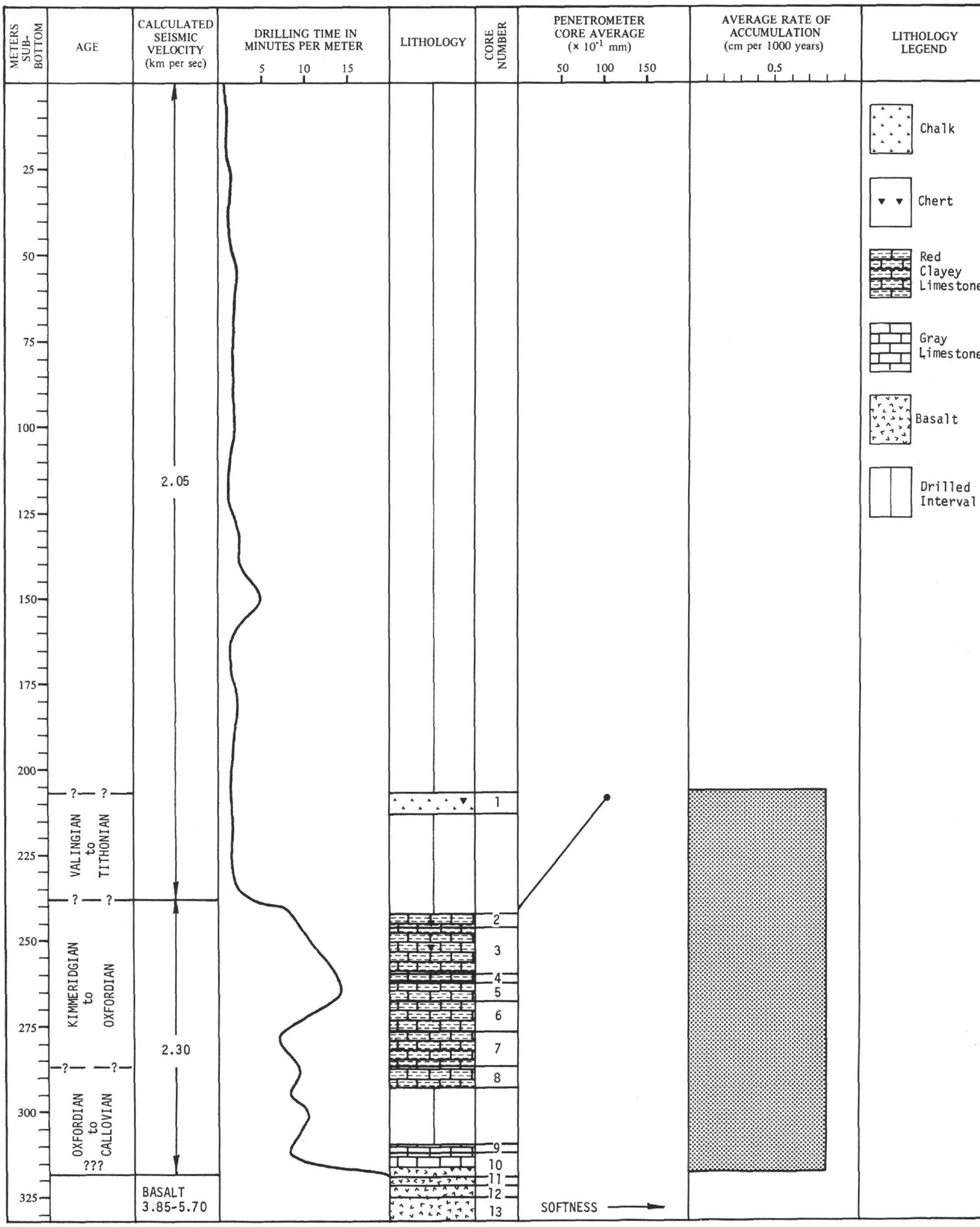


Figure 3. *Site 100 summary chart.*

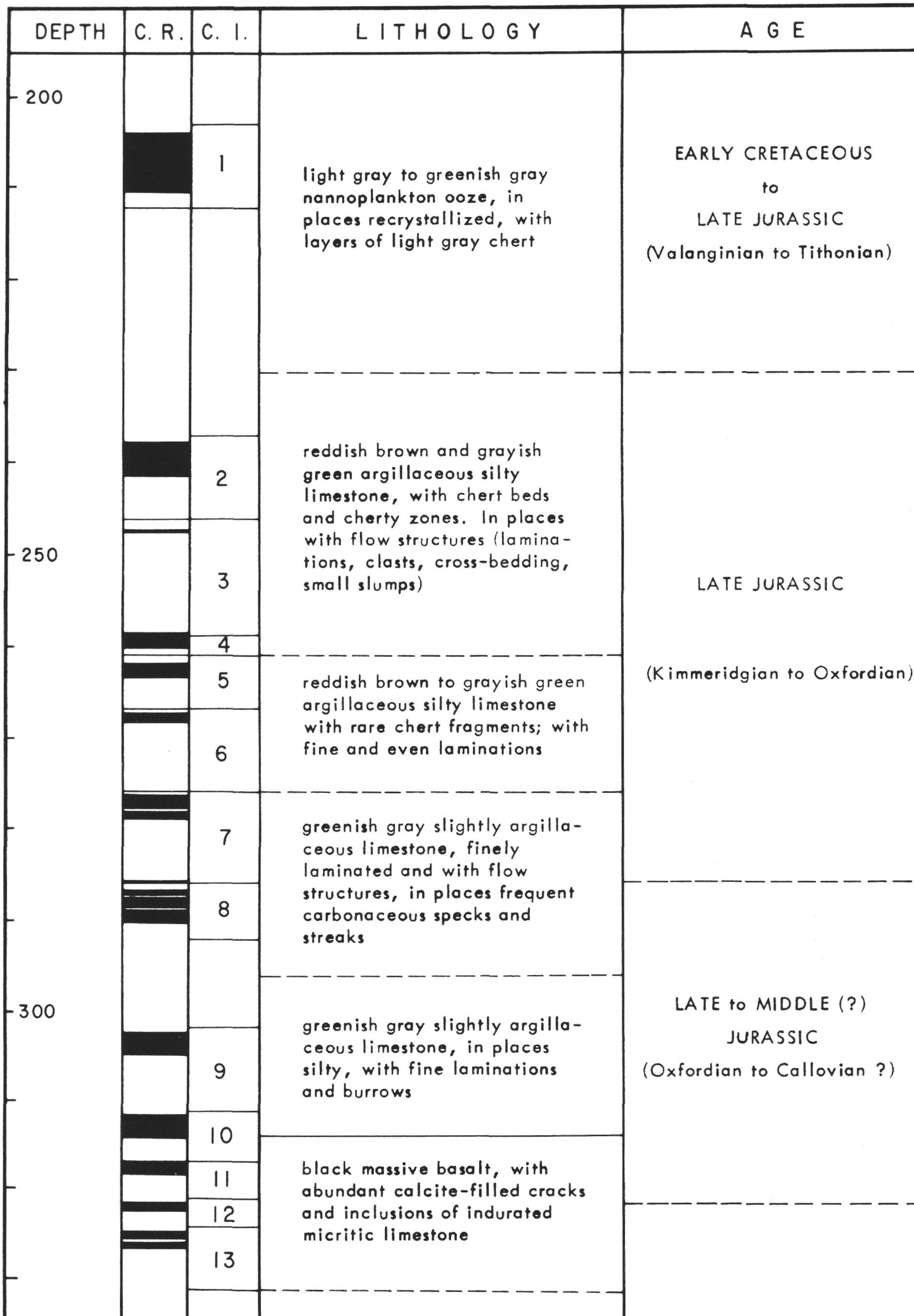
Hole 100

Latitude: 24°41.28′N
Longitude: 73°47.95W
Water depth: 5325 meters (drill pipe); 5336 meters (PDR)

Core No.	Interval Cored (meters)[a]				Lithology	Age
	Depth	Amount	Recovery	Subbottom Depth		
(Drilled)	(5335-5538)	(203)		(203)		
1	5538-5547	9	6.5	212	Nannoplankton ooze and chert	Valanginian-Tithonian
(Drilled)	(5547-5572)	(25)		(237)		
2	5572-5581	9	3.6	246	Clayey red limestone and chert	Kimmeridgian-Oxfordian
3	5581-5594	13	0.3	259	Clayey red limestone and chert	Kimmeridgian-Oxfordian
4	5594-5596	2	1.4	261	Clayey red limestone	Kimmeridgian-Oxfordian
5	5596-5602	6	1.9	267	Clayey red limestone	Kimmeridgian-Oxfordian
6	5602-5611	9	1.4	276	Clayey red limestone	Kimmeridgian-Oxfordian
7	5611-5621	10	2.7	286	Clayey red and gray limestone	Kimmeridgian-Oxfordian
8	5621-5627	6	3.2	292	Greenish-gray limestone	Oxfordian-Callovian?
(Drilled)	(5627-5637)	(10)		(302)		
9	5637-5646	9	2.1	311	Greenish-gray limestone	Oxfordian-Callovian?
10	5646-5652	6	2.0	317	Greenish-gray limestone and basalt	Oxfordian-Callovian?
11	5652-5656	4	1.4	321	Basalt	
12	5656-5659	3	1.0	324	Basalt	
13	5659-5666	7	2.0	331	Basalt	

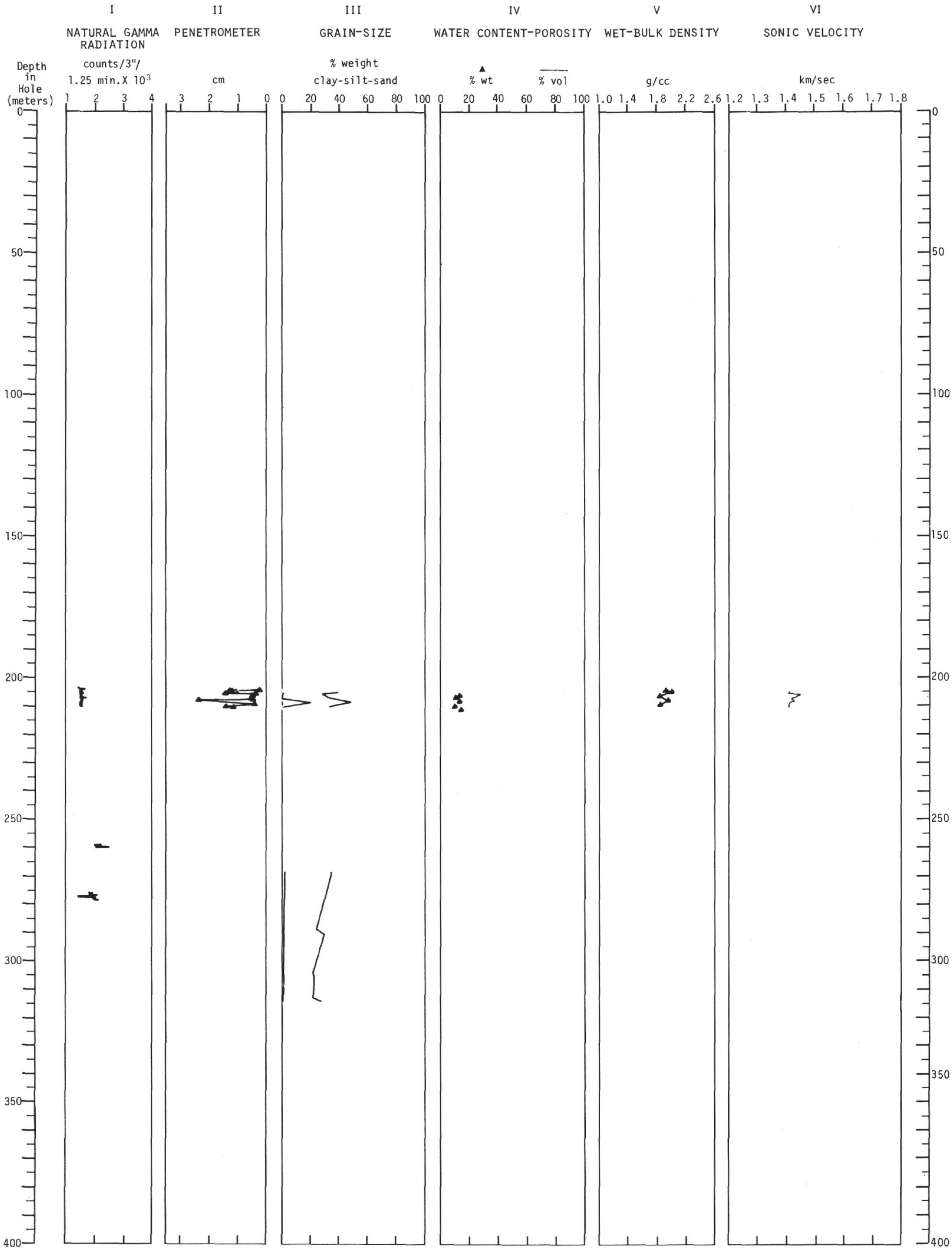
[a]All intervals are measured by drill pipe from the derrick floor which is 10 meters above water surface.

Figure 4. *Core Summary table, Site 100.*



(Depth in meters below sea floor; C.R. = core recovered, C.I. = cored interval.)

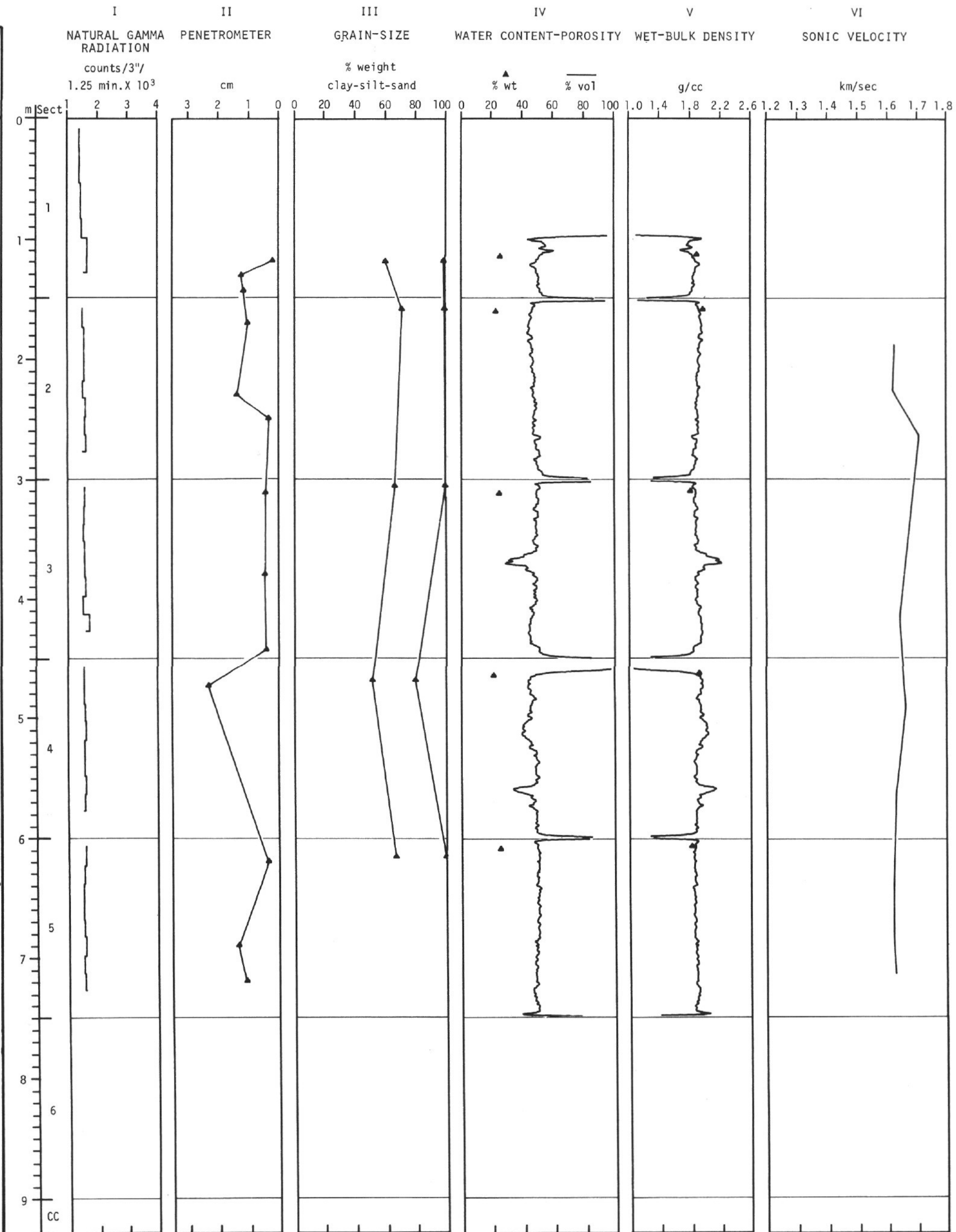
Figure 6. *Summary of lithology and age of cores recovered in Hole 100.*



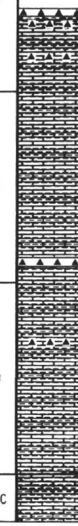
Summary of Physical Properties, Hole 100

Hole 100, Core 1 (203m to 212m)

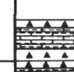
AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
EARLY CRETACEOUS to LATE JURASSIC (VALANGINIAN to TITHONIAN)		0–1	1		WR, SS	Drill cuttings from up-hole in soft white <u>nannoplankton ooze</u>; angular fragments of <u>chert</u> and <u>hard limestone</u>, one well rounded fragment of chert. <u>Nannoplankton ooze</u>, soft to firm and plastic, various shades of white (N9)-N8-5G9/1-5GY9/1) with greenish-gray (5G6/1) beds in Sect. 2, light gray (N8) and greenish white (5GY9/1) banding throughout, thin gray (N4-N7) <u>chert</u> beds; coccoliths dominant, recrystallized calcite common, nannoconids common.	OSTRACODES: *Cytherelloidea* sp., *Polycope* sp.C, *Hemicytherura ?* sp.
		2–3	2		WR, SS, SS	Angular fragments of greenish gray (5G 6/1) soft <u>chalk</u>. Greenish gray firm, brittle indurated ooze.	OSTRACODES: *Acrocythere ?* sp.
		3–4	3		SS, CN, WR, SS, WR, SS	Gray (N4-N7) chert fragments.	CALCAREOUS NANNOPLANKTON: *Nannoconus steinmanni, N. dolomiticus, N. kamptneri, Lithraphidites carniolensis, Parhabdolites embergeri, Podorhabdus quadriperforatus.* OSTRACODES: *Hemicytherura ?* sp., *Bythocythere ?* sp. A & B.
		5–6	4		CN, SS, SS, WR	Angular dark gray (N4) chert fragments. Light gray (N6) chert bed showing bedding planes and contacts with limestone. See section summary.	CALCAREOUS NANNOPLANKTON: *Nannoconus steinmanni, N. globulus, Apertapetra gronosa, Braarudospaera discula, Arkhangelskiella striata, Watznaueria actionosa*
		6–7	5		SS, WR, SS, WR	Light gray (N5) chert bed showing contact with limestone.	CALPIONELLIDS: *Remaniella* sp. aff. *R. cadischiana, Calpionellopsis* sp. aff. *C. simplex, Calpionella alpina, Tintinnopsella* sp. aff. *T. carpathica.* OSTRACODES: *Hemicytherura ?* sp.
		8	6				*CORE CATCHER* DINOFLAGELLATES: *Chlamydophorella wallala, Diacanthum hollisteri* CALCAREOUS NANNOPLANKTON: *Nannoconus steinmanni, N. globulus, Parhabdolithus embergeri, Apertapetra gronosa, Ahmuellerella asper, Arkhangelskiella striata, Braarudosphaera discula.*
			CC		TS, D,CN	Fragments of chert showing replacement of nannoplankton and radiolarians.	



Hole 100, Core 2 (237m to 246m)

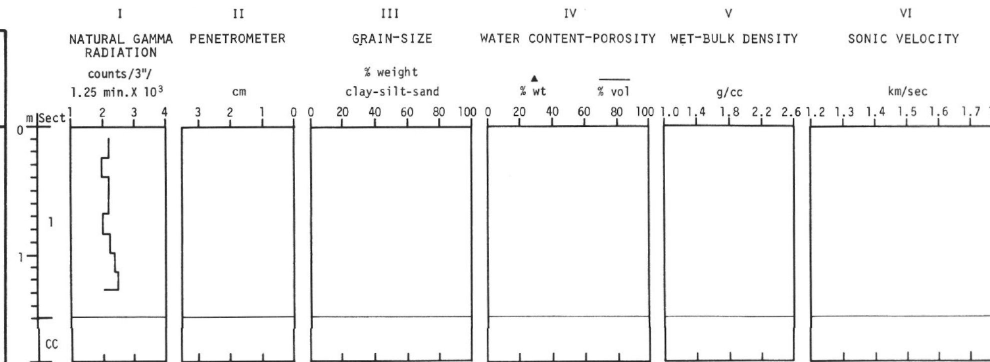
AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC		1	1		CN SS	<u>Limestone</u>; slightly clayey and silty, with <u>chert</u> beds and cherty zones, various shades of reddish brown (5YR3/3, 4/3, 4/4, 6/4, 10R 4/6) and grayish green (5G7/1, 5GY5/2, 10G5/2, 10GY5/2). Fine laminations with common burrowing and rare pink white clasts; several zones of flow structures and penecontemporaneous deformations with abundant clasts (lithified mud pebbles) and minor slumping and cross-bedding. Few thin dark reddish brown (2.5YR2/4) chert lenses. Recrystallized calcite (sometimes spindle-shaped grains) dominant, coccoliths rare to common, hematite staining and abundant clay minerals in the darker layers. Some aptychi in Sections 2 and 3. See section summary for Section 2.	CALCAREOUS NANNOPLANKTON: *Watznaueria britannica, Parhabdolithus embergeri, Cyclagelosphaera margereli, Hexapodorhabdus cuvillieri, Zygodiscus salillum, Diazomatholithus lehmani*
		2	2		SS SS CN SS		CALCAREOUS NANNOPLANKTON: *Watznaueria britannica, Hexapodorhabdus cuvillieri, Zygodiscus salillum*
		3 4	3		SS SS SS		
			CC		SS CN		*CORE CATCHER* CALCAREOUS NANNOPLANKTON: *Watznaueria britannica, Zygodiscus erectus, Z. salillum, Parhabdolithus liasicus, Diazomatolithus lehmani*

Hole 100, Core 3 (246 m to 259 m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC		1	1		SS	<u>Limestone</u>; slightly clayey, pale brown (5YR5/2), finely laminated with common burrowing, bands of light greenish gray (5G7/1) with flow structures. Brown <u>chert</u> (2.5YR2/4 to 5YR5/2) at the top; pale olive (10Y6/2) and yellowish gray (5Y7) larger chert fragment at bottom. Coccoliths abundant, recrystallized calcite common, clay minerals common.	
			CC		D,CN	<u>Cherty limestone</u>; banded with light brown (5YR6/4) and grayish green (10GY5/2) finely laminated with burrowing and flow structures. <u>Limestone</u>, clayey, soft, grayish yellow green (5GY7/2); distorted laminations and faulting, coccoliths and clay minerals abundant, recrystallized calcite rare.	*CORE CATCHER* DINOFLAGELLATES: *Chytroeisphaeridia pococki* CALCAREOUS NANNOPLANKTON: *Stephanolithion bigoti, Hexapodorhabdus cuvillieri, Zygodiscus erectus, Watznaueria britannica, W. barnesae*

Hole 100, Core 4 (259m to 261m)

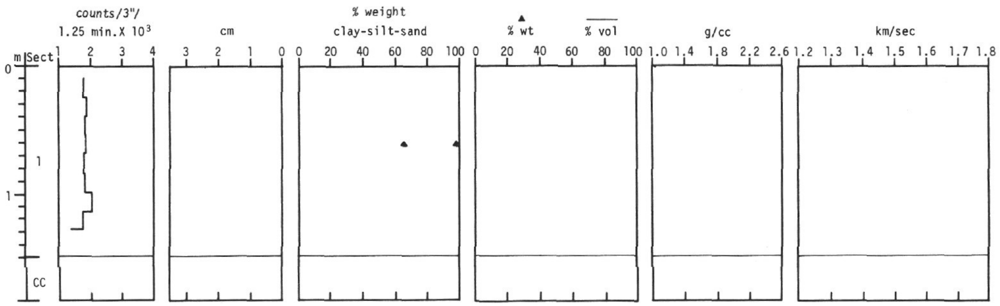
AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC		1	1		WR SS SS CN WR SS	Limestone, slightly clayey, with occasional thin silty zones; dominantly reddish brown (5YR3/3, 4/3) with interbedded grayish green (10G5/2, 8/2) zones. Thin laminations in the darker zones, with penecontemporaneous deformations, rare flow structures and rare clasts (lithified small mud pebbles); light zones are more massive and often silty, burrowing is common throughout the section; occasional cherty zones, recrystallized calcite (mainly spindle-shaped) dominant, coccoliths common, clay minerals abundant and hematite common in darker zones.	CALCAREOUS NANNOPLANKTON: *Hexapodorhabdus cuvillieri, Zygodiscus erectus, Z. salillum, Watznaueria britannica, W. barnesae, Diazomatolithus lehmani* PELAGIC CRINOIDS: *Saccocoma* sp. cf. *S. quenstedti, S.* sp. cf. *S. schattenbergi*
			CC		SS D,CN		*CORE CATCHER* DINOFLAGELLATES: *Chytroeisphaeridia pococki, Gonyaulacysta nuciformis, G. ambigua* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Z. erectus, Diazomatolithus lehmani, Watznaueria britannica, W. barnesae, Palaeopontosphaera dubia*



Hole 100, Core 5 (261m to 267m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC		1	1		SS	Limestone, slightly clayey, with some silty layers, various shades of greenish gray (5G6/1, 7/1, 8/1, 9/1), interbedded with pale red (5YR5/2, 6/2) in the lower portion. Even laminations and faint layering throughout, with some burrowing. Most of the core shows artificial layering due to coring operations. Recrystallized calcite (spindle-shaped grains) dominant, coccoliths rare, clay minerals abundant in darker zones.	CALCAREOUS NANNOPLANKTON: *Watznaueria britannica, Cyclagelosphaera margereli, Palaeopontosphaera dubia, Zygodiscus erectus, Z. salillum* PLANKTONIC CRINOIDS: *Saccocoma* sp. cf. *S. subornata, Saccocoma* sp.
		2	2		WR SS SS CN SS		
			CC		SS CN		*CORE CATCHER* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Z. erectus, Watznaueria britannica, W. barnesae, Palaeopontosphaera dubia, Diazomatolithus lehmani* PLANKTONIC CRINOIDS: *Saccocoma* sp. cf. *S. schattenbergi*

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC		1	1 CC		WR CN SS SS SS SS CN,F	Limestone, slightly clayey, with some silty layers; interbedded layers of grayish red (10R4/2), pale reddish brown (10R5/4), grayish green (10GY5/2, 5G8/1) and pale to dark brown (5YR3/2, 5YR6/2). Fine and even laminations; artificial bedding due to coring operations. Recrystallized calcite (spindle-shaped grains) and coccoliths common to abundant, clay minerals and hematite staining abundant in red zones. Sand size chert fragments in core catcher sample.	CALCAREOUS NANNOPLANKTON: *Hexapodorhabdus cuvillieri, Zygodiscus salillum* FORAMINIFERS: *Turrispirillina amoena, Lenticulina quenstedti, Frondicularia lingulaeformis, Lingulina umbra* PLANKTONIC CRINOIDS: *Saccocoma* sp. cf. *S. subornata* *CORE CATCHER* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Palaeopontosphaera dubia, Diazomatolithus lehmani, Watznaueria britannica, Hexapodorhabdus cuvillieri* FORAMINIFERS: *Lenticulina quenstedti*

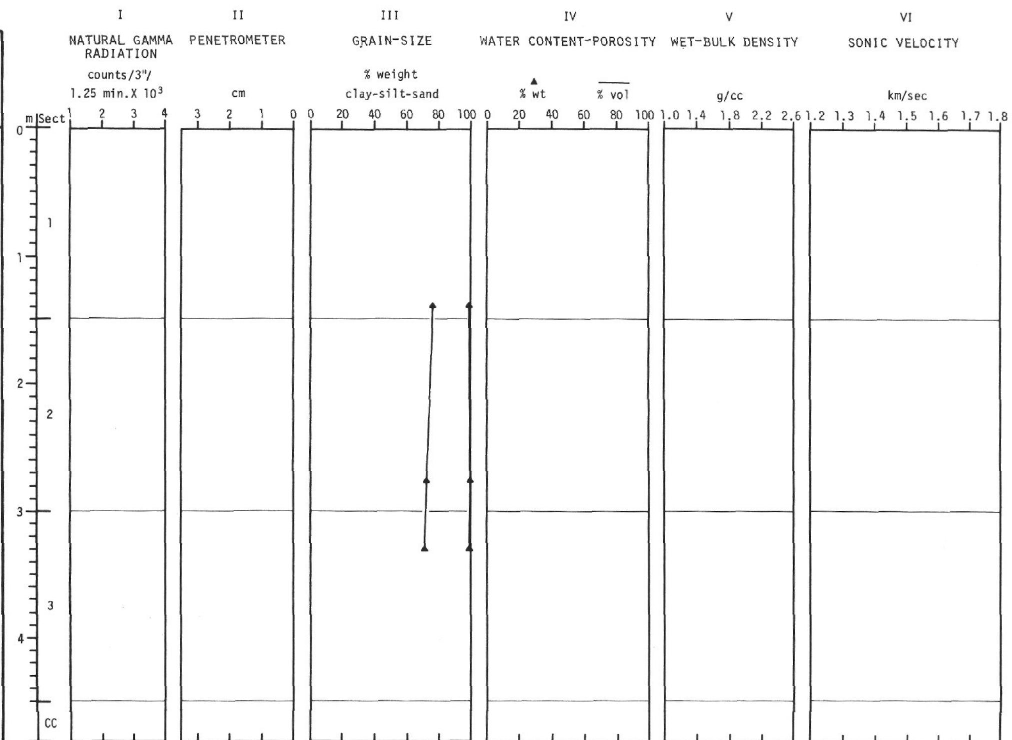


Hole 100, Core 7 (276m to 286m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC (OXFORDIAN?)		1 2	1 2 CC		SS SS SS SS WR SS D SS WR SS SS CN WR SS D,CN, F,O	Limestone, very slightly clayey, various shades of greenish gray (5GY6/1, 5G7/1, 5G7/2). Fine laminations and flow structures with minor slumps, abundant burrows, carbonaceous specks and streaks abundant in Section 2. Some burrows filled with pyrite and lined with films of carbonaceous matter. Recrystallized calcite (essentially spindle-shaped grains) largely dominant, coccoliths rare. See section summary for Section 1.	DINOFLAGELLATES: *Meiourogonyaulax valensii* FORAMINIFERS: *Frondicularia lingulaeformis, Lingulina umbra* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Watznaueria britannica, W. barnesae, Diazomatolithus lehmani, Palaeopontosphaera dubia* FORAMINIFERS: *Dentalina jurensis, D. communis, Frondicularia lingulaeformis, Lingulina umbra* OSTRACODES: *Orthonotacythere ?* sp. *CORE CATCHER* DINOFLAGELLATES: *Meiourogonyaulax valensii, Pareodinia ceratophora, Gonyaulacysta nuciformis, Chytroeisphaeridia pococki* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Z. minimus, Staurolithites bochotnicae, Watznaueria britannica, Diazomatolithus lehmani, Loxolithus armilla* FORAMINIFERS: *Dentalina jurensis, D. communis, Pseudonodosaria candela* OSTRACODES: *Pontocyprella* sp., *Acrocythere ?* sp.

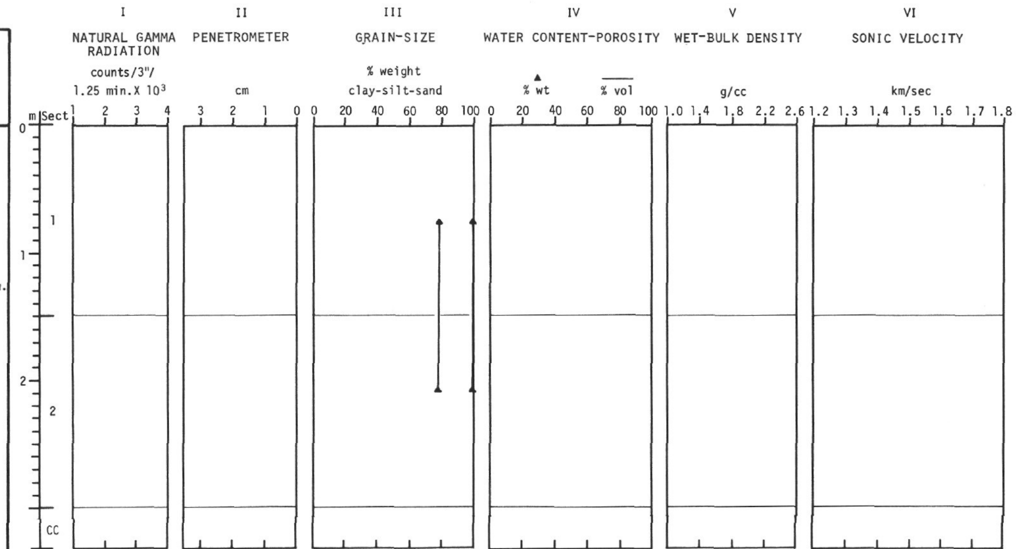
Hole 100, Core 8 (286m to 297m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE to MIDDLE (?) JURASSIC (OXFORDIAN to CALLOVIAN?)		1	1		WR, SS, CN, D	Limestone, very slightly clayey, with some silty zones, very hard; greenish gray (5G7/1). Occasional faint laminations with minor deformations and common burrowing. Abundant olive gray (5Y4/1) carbonaceous debris (some are pyrite filled molds of small plant stems, twigs and leaves lined with carbonaceous film). Recrystallized calcite (essentially spindle-shaped grains) largely dominant, coccoliths rare. See section summary for Section 3.	DINOFLAGELLATES: *Meiourogonyaulax valensii, Gonyaulacysta nuciformis Chytroeisphaeridia pococki, Ch. chytroeides, Tenua verrucosa, Endoscrinium galeritum* CALCAREOUS NANNOPLANKTON: *Stephanolithion bigoti, Zygodiscus salillum, Ethmorhabdus gallicus, Staurolithites quadriarcullus, Parhabdolithus liasicus* FORAMINIFERS: *Turrispirillina amoena, Bolivinopsis jurassicus, Dentalina jurensis, D. laevigata* OSTRACODES: *Bairdia (Akidobairdia) farinacciae, Acratia* sp., *Polycope* sp., *A, Acrocythere ?* sp.
		2	2		WR, WR, SS, WR, D		
		3, 4	3		SS, WR, CN, SS, WR		CALCAREOUS NANNOPLANKTON: *Parhabdolithus liasicus, Zygodiscus salillum, Staurolithites quadriarcullus, Ethmorhabdus gallicus, Watznaueria britannica* FORAMINIFERS: *Dentalina jurensis, D. laevigata, Trocholina transversarii* OSTRACODES: *Bairdia (Akidobairdia) farinacciae, Pontocyprella* sp., *Polycope* sp. D.
			CC		D, F, O		*CORE CATCHER* DINOFLAGELLATES: *Meiourogonyaulax valensii, Gonyaulacysta nuciformis, Chytroeisphaeridia pococki, Ch. chytroeides, Tenua verrucosa, Endoscrinium galeritum* FORAMINIFERS: *Dentalina jurensis, D. laevigata* OSTRACODES: *Bairdia (Akidobairdia) farinacciae*



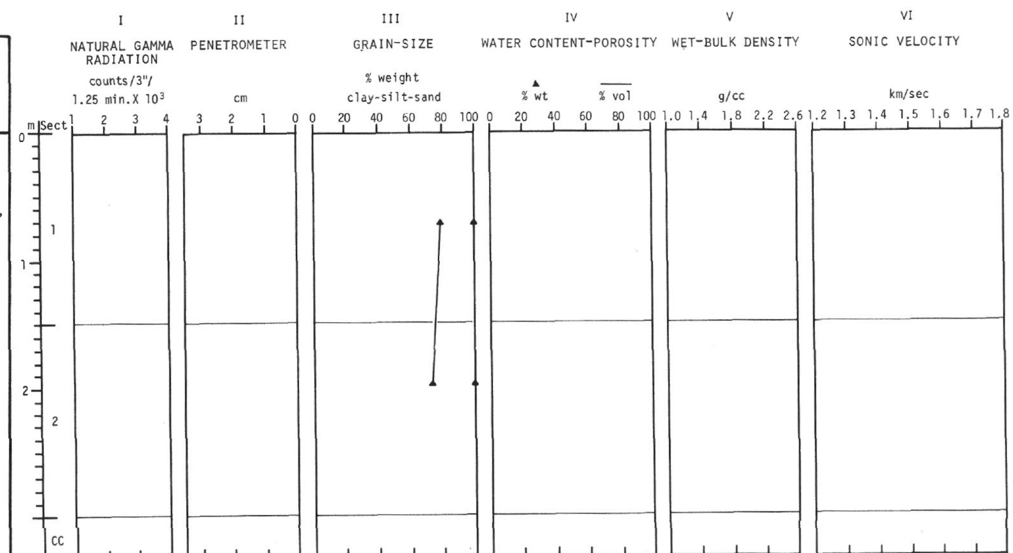
Hole 100, Core 9 (302m to 311m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE to MIDDLE (?) JURASSIC (OXFORDIAN to CALLOVIAN?)		1, 2	1, 2, CC		SS, D, WR, SS, SS, SS, WR, SS, CN, WR, SS, D,CN, F,O	<u>Limestone</u>, very slightly clayey, with occasional silty zones, hard, greenish gray (5G7/1) with some pale red (5YR6/1 and 10R6/2) layers. Faint and rare laminations and minor current action evidences, common burrowing. Abundant plant debris and occasional pelecypod shell fragments. Recrystallized calcite (spindle-shaped grains) dominant, coccoliths rare.	DINOFLAGELLATES: *Gonyaulacysta nuciformis, Chytroeisphaeridia pococki, Ch. chytroeides, Endoscrinium galeritum.* FORAMINIFERS: *Dentalina jurensis, Lenticulina polonica* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Z. bussoni, Loxolithus armilla, Parhabdolithus liasicus, Palaeopontosphaera dubia* FORAMINIFERS: *Bolivinopsis jurassicus, Dentalina jurensis, D. laevigata, Astacolus major, Pseudonodosaria* sp. ex gr. *P. hybrida, Marssonella doneziana* *CORE CATCHER* DINOFLAGELLATES: *Gonyaulacysta nuciformis, G. ambigua, Chytroeisphaeridia pococki, Ch. chytroeides, Endoscrinium galeritum, Pareodinia ceratophora* CALCAREOUS NANNOPLANKTON: *Ethmorhabdus gallicus, Zygodiscus bussoni, Parhabdolithus liasicus, Watznaueria britannica* FORAMINIFERS: *Bolivinopsis jurassicus, Bigenerina arcuata, B. jurassica, Dentalina jurensis, D. laevigata, D. oppeli, Lingulina vulgata* OSTRACODES: *Pontocyprella* sp., *Cytherella* sp.



Hole 100, Core 10 (311m to 317m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE to MIDDLE (?) JURASSIC (OXFORDIAN to CALLOVIAN ?)		1 2	1 2 CC		SS WR SS SS WR SS SS WR WR CN WR SS WR SS D CN	<u>Limestone</u>, slightly clayey, with occasional silty zones, hard with softer disturbed zones, greenish gray (5G7/1) interbedded with light brownish gray (5YR6/1) and olive gray (5Y4/1). Rare laminations, common burrowing, abundant plant debris. Artificial bedding, due to coring operations, in darker zones. Recrystallized calcite (spindle-shaped grains) dominant, coccoliths rare, clay minerals abundant with hematite staining in darker zones. <u>Basalt</u>, massive, black (N1) with abundant thin calcite filled cracks; Top 1.5 cm appear more glassy. Thin sections show a hyalophitic structure with abundant glass, abundant labradorite needles, some olivine. See section summary for Section 2. Rare calcareous material in core-catcher (debris of limestone inclusion or contamination from up-hole)	DINOFLAGELLATES: *Gonyaulacysta ambigua, G. nuciformis, Chytroeisphaeridia pococki, Ch. chytroeides, Tenua verrucosa, Dictyopyxis reticulata* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Ethmorhabdus gallicus, Parhabdolithus liasicus, Diazomatolithus lehmani, Watznaueria britannica* FORAMINIFERS: *Reophax helveticus, R. multilocularis, Bolivinopsis jurassicus, Bigenerina arcuata, B. jurassica, Dentalina jurensis, Trocholina transversarii* *CORE CATCHER* CALCAREOUS NANNOPLANKTON: *Ethmorhabdus gallicus, Parhabdolithus liasicus, Zygodiscus salillum, Z. bussoni, Watznaueria britannica*



Hole 100, Core 11 (317m to 321m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE to MIDDLE (?) JURASSIC		1	1		TS, CN, TS, TS, TS	Basalt, massive, black (N1) with abundant thin calcite-filled cracks. Inclusions of hard micritic limestone. Lenticular basaltic fragments in limestone matrix. Thin sections of basalt show a hyalophitic structure with abundant glass, abundant labradorite needles, some olivine. See section summary, for Section 1. Some limestone chips and basalt in core-catcher.	CALCAREOUS NANNOPLANKTON: *Watznaueria britannica, Zygodiscus salillum, Diazomatolithus lehmani*
			CC		CN		*CORE CATCHER* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Z. bussoni, Ethmorhabdus gallicus*

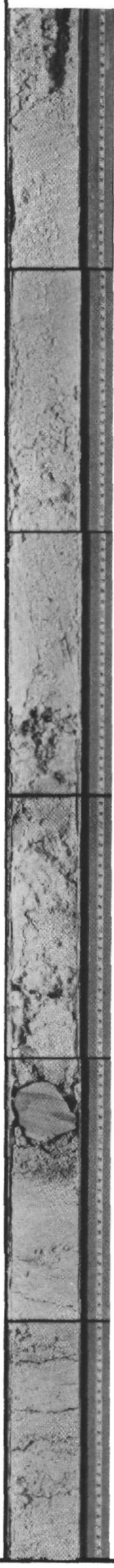
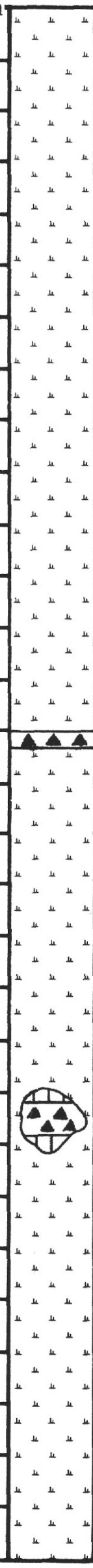
Hole 100, Core 12 (321m to 324m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
		1	1		TS	Basalt, massive, black (N1) with greenish black cast on some surfaces, abundant thin calcite filled cracks. Hyalophitic structure with abundant glass, abundant labradorite needles and some olivine. Inclusion of limestone, light greenish gray with faint pink tint in places (completely recrystallized micritic limestone).	

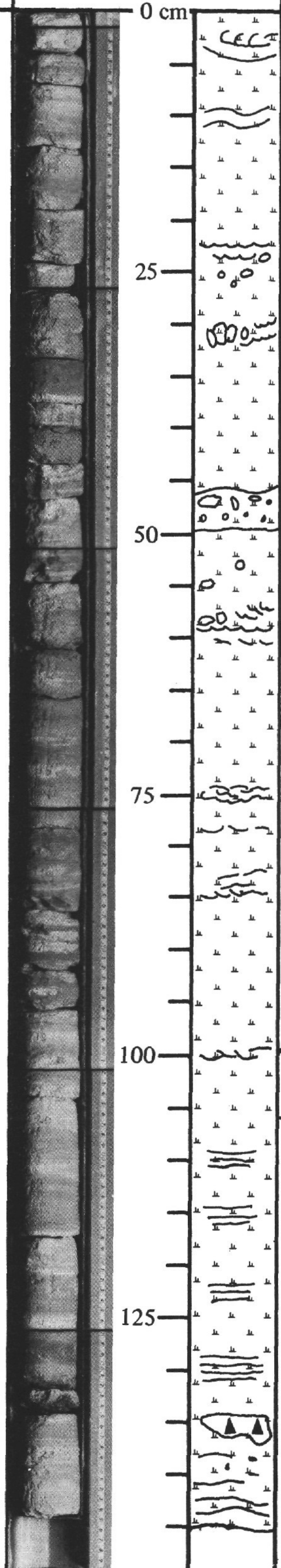
Hole 100, Core 13 (324m to 331m)

AGE	ZONE	DEPTH (m)	SECTION NO.	LITHOLOGY	SAMPLE INTERVAL	LITHOLOGY	DIAGNOSTIC FOSSILS
		1	1			Basalt, massive, black (N1), with abundant calcite filled cracks.	
		2	2			Bottom 2 cm: Very abundant subhorizontal calcite filled fractures.	

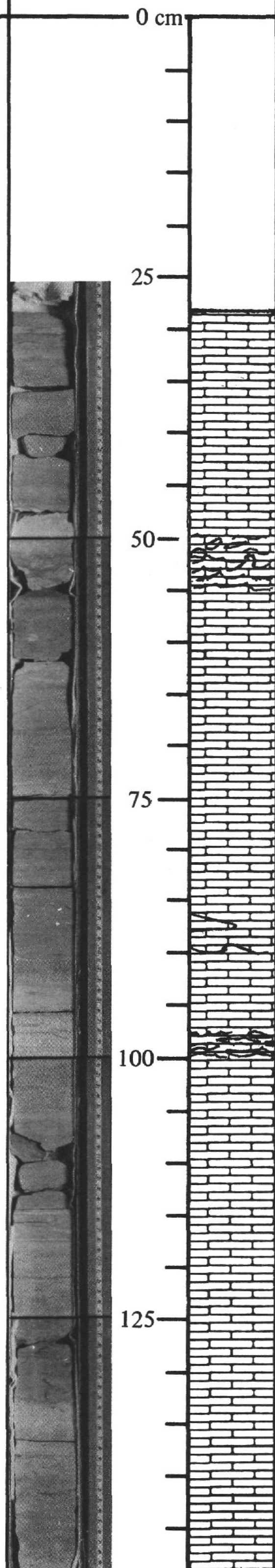
Hole 100, Core 1, Section 4

AGE	ZONE	LITHOLOGY	SAMP. INT	LITHOLOGY	DIAGNOSTIC FOSSILS
EARLY CRETACEOUS to LATE JURASSIC (VALONGINIAN TO THITHONIAN)		  0 cm, 25, 50, 75, 100, 125	SS	Smear Slide: Nannoplankton dominant, recrystallized calcite common.	
				<u>Nannoplankton ooze</u>, soft to firm and plastic; white (N9) with greenish gray (5GY 6/1) and light gray (N7) banding. Some fine chert debris scattered throughout the section.	
			CN	<u>Chert</u> (broken fragments) dark gray (N4), at top of a greenish gray band.	CALCAREOUS NANNOPLANKTON: *Nannoconus steinmanni*, *N. globulus*, *Apertapetra gronosa*, *Braarudosphaera discula*, *Arkhangelskiella striata*, *Watznaueria striata*
			SS	Smear Slide: Nannoplankton dominant, (common nannoconids), recrystallized calcite abundant.	
			SS	<u>Chert</u> fragment, light gray (N6) showing bedding planes and sharp contact with hard white chalk at top and bottom-this fragment is at top of a light gray (N7) band in which some organic debris are present.	
			WR	Light gray (N8 and N7) diffuse banding from 115 to 150 cm.	

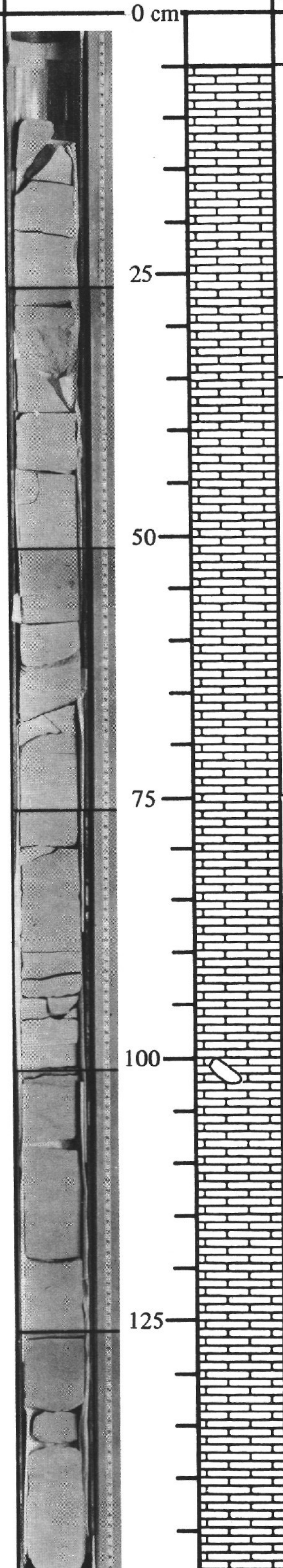
Hole 100, Core 2, Section 2

AGE	ZONE	LITHOLOGY	SAMP. INT	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC			-SS -SS -CN -SS	Smear slide in white layer: Recrystallized calcite dominant (spindles), nannoplankton rare. Smear slide in red layer: Clay minerals and nannoplankton abundant, recrystallized calcite common, hematite rare (+ staining). Clayey limestone, slightly silty, with occasional chert; reddish brown (10R 4/6) and grayish green (5G-7/1) with some pink white clasts and rare Aptychi. -0 to 103 cm = abund. flow structures, penecontemporaneous disturbances, minor slumping, numerous clasts (pink white small lithified mud pebbles). Some finely laminated zones. -103 to 145 cm = rare flow structures, common burrowing and abundant laminations, rare small white clasts. Smear slide: Clay mins. and nannoplankton abundant, recrystallized calcite common. chert, dark reddish brown (2.5YR 2/4).	CALCAREOUS NANNOPLANKTON: *Watznaueria britannica*, *Hexapodorhabdus cuvillieri*, *Zygodiscus salillum*

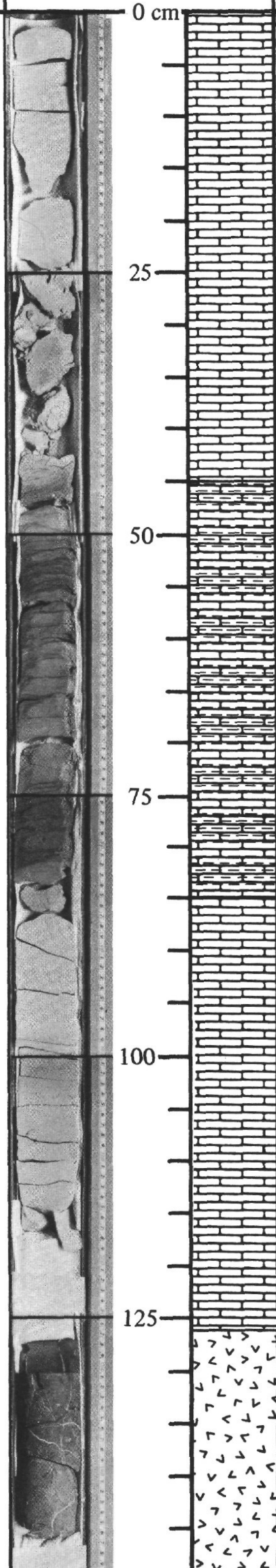
Hole 100, Core 7, Section 1

AGE	ZONE	LITHOLOGY	SAMP. INT	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE JURASSIC (OXFORDIAN?)			SS SS SS SS WR SS PR	<u>Limestone</u>, grayish green (5G 7/1) with occasional flow structures clasts and laminations; abundant burrowing. Smear slides: Nannoplankton abundant, recrystallized calcite (rare spindles) common. Flow structures and clasts Smear slide: Sand size chert grains and recrystallized nanno-calcite common, nannoplankton rare Large lens, burrow? Flow structures Smear slides: Nannoplankton abundant, recrystallized calcite (no spindles) common. (in a black speck) Spindle-shaped recryst. calcite abundant, organic matter common, nannoplankton rare Numerous burrows with carbonaceous matter fillings from 105 to 150 cm.	DINOFLAGELLATES: *Meiourogonyaulax valensii* FORAMINIFERS: *Frondicularia lingulaeformis, Lingulina umbra*

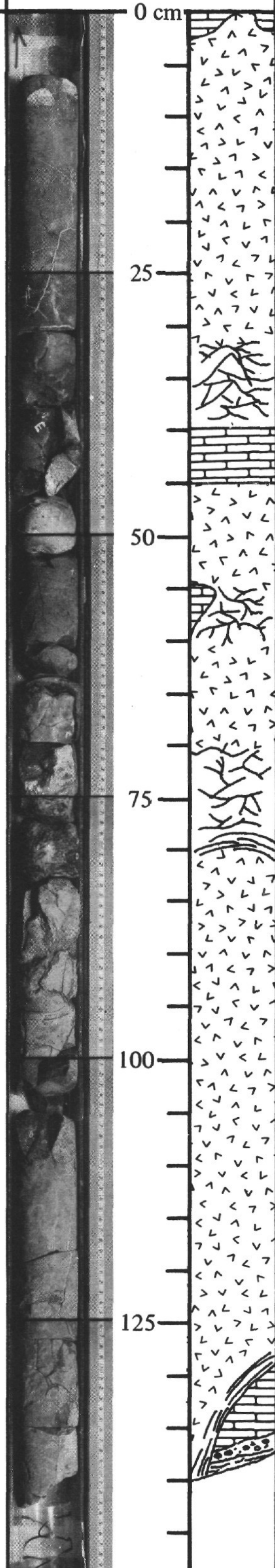
Hole 100, Core 8, Section 3

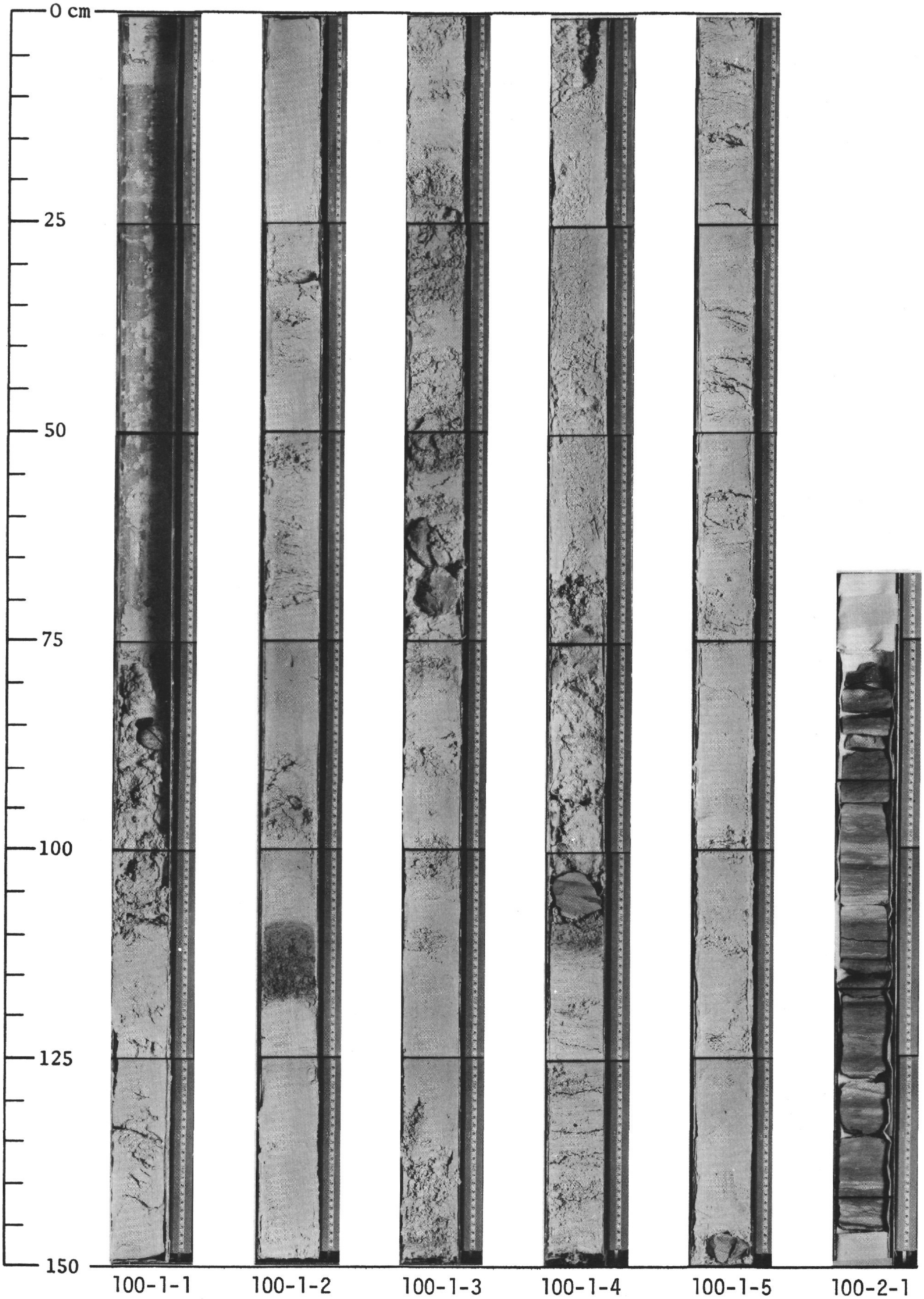
AGE	ZONE	LITHOLOGY	SAMP. INT	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE TO MIDDLE (?) JURASSIC (OXFORDIAN to CALLOVIAN?)			SS WR CN SS WR	Smear slides: Recrystallized calcite (spindles) dominant; clay min., hematite, nannoplankton and organic matter rare. <u>Limestone</u>, very slightly clayey, hard; greenish gray (5G 7/1). Rare faint laminations with minor deformation. Common burrowing. Abundant olive gray (5Y 4/1) carbonaceous debris, pyrite-filled molds of small plant stems, twigs and leaves lined with ca carbonaceous film. Occasional plant stems on bedding planes. Small lens of light olive gray (5Y 6/1) with numerous small white clasts (Burrow?).	CALCAREOUS NANNOPLANKTON: *Parhabdolithus liasicus*, *Zygodiscus salillum*, *Staurolithites quadriarcullus*, *Ethmorhabdus gallicus*, *Watznaueria britannica*. FORAMINIFERS: *Dentalina jurensis*, *D. laevigata*, *Trocholina transversarii*. OSTRACODES: *Bairdia (Akidobairdia) farinacciae*, *Pontocyprella* sp., *Polycope* sp.

Hole 100, Core 10, Section 2

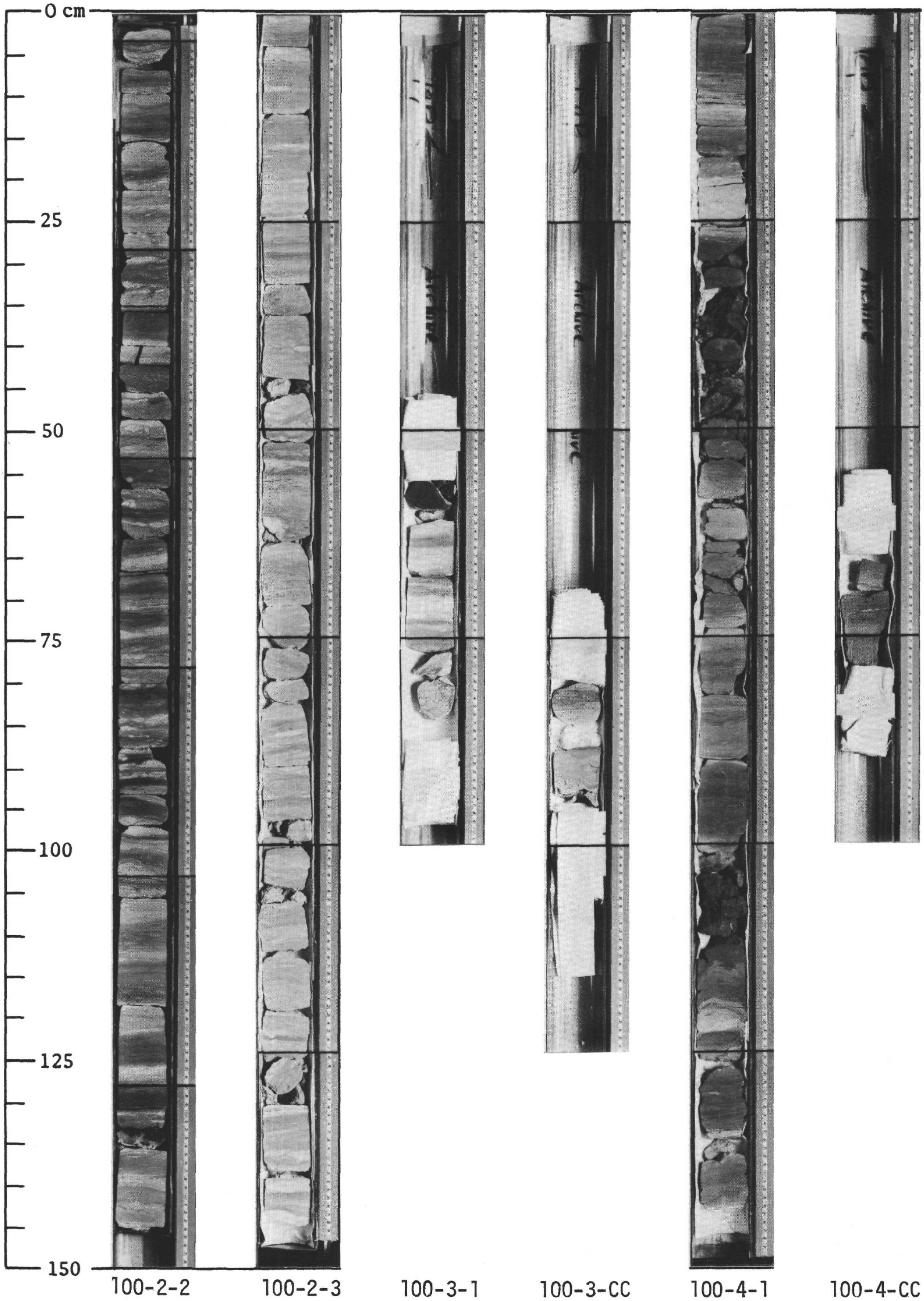
AGE	ZONE	LITHOLOGY	SAMP. INT	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE TO MIDDLE (?) JURASSIC (OXFORDIAN TO CALLOVIAN?)		 0 cm 25 50 75 100 125	SS WR WR CN WR SS WR PA SS CN	<u>Limestone</u>, slightly clayey, greenish gray (5G 7/1). Massive, no lamination, rare burrowing. Recrystallized calcite (spindles) dominant, nannoplankton and organic matter rare. Soft <u>clayey limestone</u>, olive gray (5Y 4/1), with artificial bedding due to coring operations. Clay mins. and re-crystallized calcite (spindles) abundant; hematite, nannoplankton and organic matter rare. <u>Limestone</u> as in upper part of the section. Recrystallized calcite (spindles) dominant; clay mins., nanno-plankton and organic matter rare. No contact metamorphism <u>Basalt</u>, massive, black (N1), with abundant thin calcite-filled cracks. Top 1.5 cm appear more glassy.	DINOFLAGELLATES: *Gonyaulacysta nuciformis, G. ambigua, Chytroeisphaeri-dia pococki, Ch. chytroei-des, Tenua verrucosa.* CALCAREOUS NANNOPLANKTON: *Zygodiscus salillum, Ethmo-rhabdus gallicus, Parhabdo-lithus liasicus, Diazomato-lithus lehmani, Watznaueria britannica.* FORAMINIFERS: *Reophax helveticus, R. multilocularia, Bolivin-opsis jurassicus, Bigenerina arcuata, B. jurassica, Dentalina jurensis, Trocholina transversarii.*

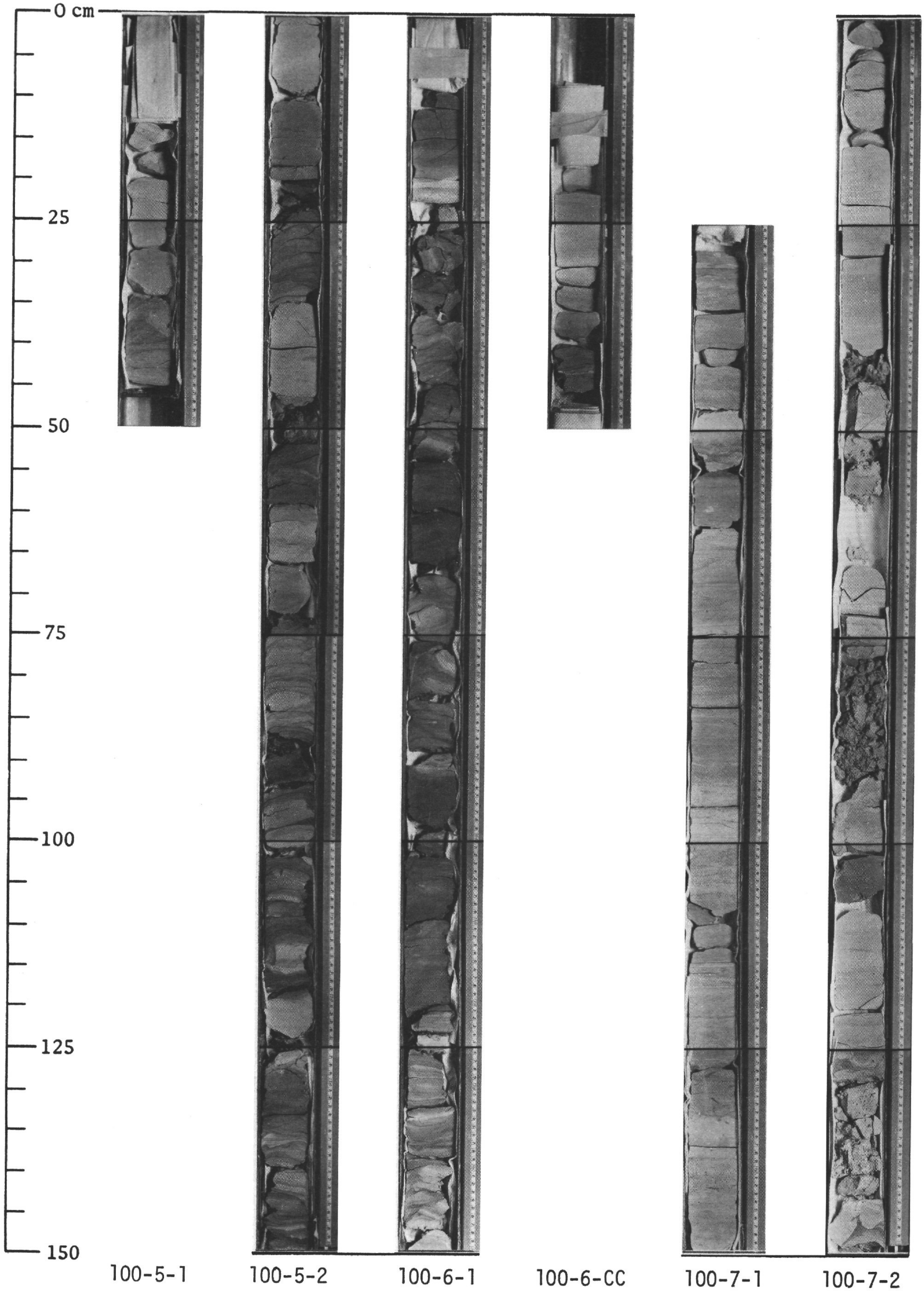
Hole 100, Core 11, Section 1

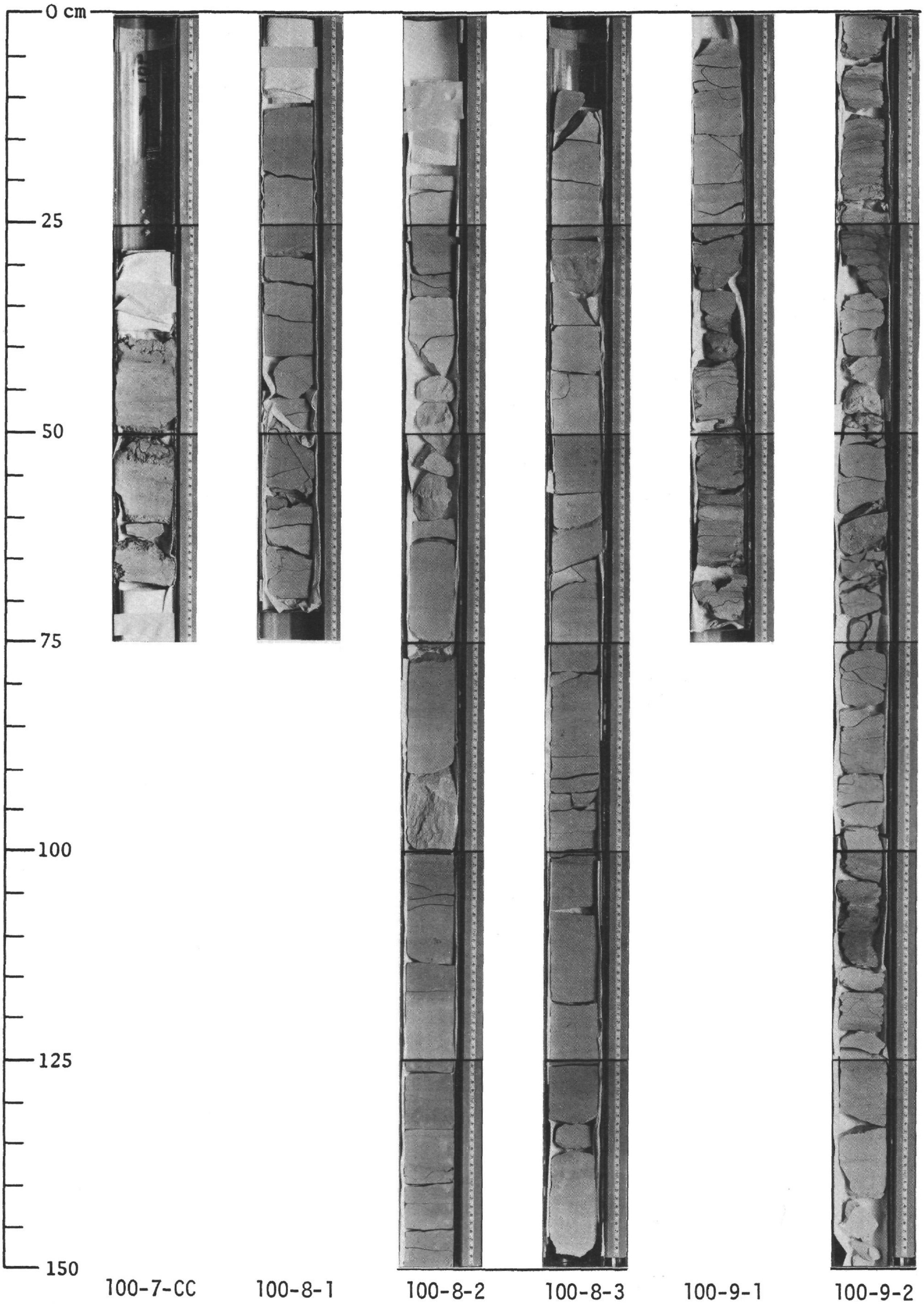
AGE	ZONE	LITHOLOGY	SAMP. INT	LITHOLOGY	DIAGNOSTIC FOSSILS
LATE to MIDDLE (?) JURASSIC (OXFORDIAN to CALLOVIAN?)			CN	Calcite inclusions (thick veinlets) Basalt (black = N1), massive with thin calcite-filled cracks; thin sections show a hyalophitic structure. Glassy veinlets (very thin) and more or less vesicular texture. Limestone (micritic) inclusion Massive basalt w. thin calcite-filled cracks. Glassy veinlets and vesicular texture. Massive basalt w. thin calcite-filled cracks. Glassy thin veinlets and vesicular texture Curved lamellar and glassy surface. Massive, with thin calcite filled cracks. Lamellar texture with calcite veinlets surrounding a limestone inclusion with small glassy particles of basalt at lower part.	CALCAREOUS NANNOPLANKTON: *Watznaueria barnesae*, *Zygodiscus salillum*, *Diazomatolithus lehmani*.

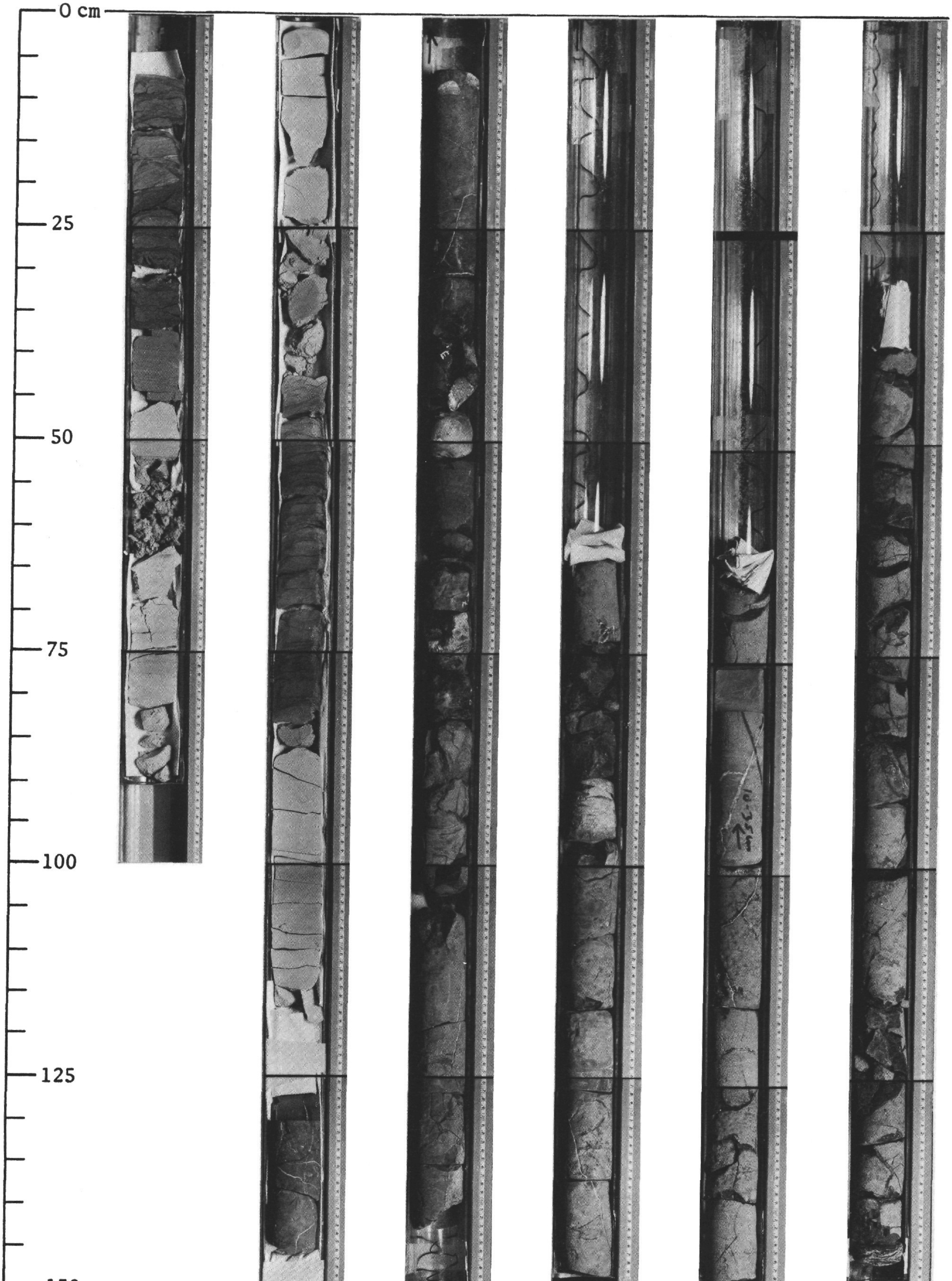


0 cm
25
50
75
100
125
150
100-1-1
100-1-2
100-1-3
100-1-4
100-1-5
100-2-1


0 cm
25
50
75
100
125
150
100-2-2
100-2-3
100-3-1
100-3-CC
100-4-1
100-4-CC


0 cm
25
50
75
100
125
150
100-5-1
100-5-2
100-6-1
100-6-CC
100-7-1
100-7-2


0 cm
25
50
75
100
125
150
100-7-CC
100-8-1
100-8-2
100-8-3
100-9-1
100-9-2



100-10-1 100-10-2 100-11-1 100-12-1 100-13-1 100-13-2